



155 Brown Road, Suite 100
St. Peters, MO 63376

Phone: 636-397-3478
Fax: 636-397-1578

May 18, 2004

Orf Construction
Attn: Brian Micklewright
4317 Bridgeton Industrial Drive
Bridgeton, MO 63044

Phone: 314-298-0770
Fax: 314-298-0939

RE: MCKNIGHT CHURCH OF CHRIST

Dear Brian:

Kuesel Excavating Company, Inc. hereby guarantees all materials, equipment and labor performed by us is in accordance with the contract, drawings, specifications and alterations and additions thereto on the McKnight Church of Christ project.

Should any defect develop within one (1) year from date of final completion, May 10, 2004, and acceptance of the work by owners, due to improper materials or workmanship, the same will, upon written notice, be made good by us without expense to the owners.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael T. Steiniger", written over a circular stamp or seal.

Michael T. Steiniger, P.E.
President

MTS/bsm

Fischer Plumbing, Inc.

18142 Country Trails Ct. • Wildwood, MO 63038 • 636-458-2895 • Fax 636-458-0297

August 20, 2004

Fischer Plumbing Inc.
18142 Country Trails Ct.
Wildwood, MO. 63038

RE: McKnight Road Church of Christ
warranty letter

To Whom it may concern:

Fischer Plumbing Inc. hereby guarantees that all labor, materials, and workmanship performed by us in accordance with the contract, drawings, specifications and additions thereto.

Should any defect develop within one year from the date of substantial completion, due to improper materials, workmanship, or arrangement, the same will, upon written notice, be made good by us without expense to the owner.

Sincerely,

A handwritten signature in black ink, appearing to read "Thomas L. Fischer", written over a horizontal line.

Thomas L. Fischer, President

N.B. WEST CONTRACTING COMPANY

ASPHALT PAVING CONTRACTORS
COMMERCIAL • RESIDENTIAL • INDUSTRIAL
ASPHALTIC CONCRETE • HOT SEAL • SLURRY SEAL

2780 Mary Avenue

Saint Louis, MO 63144-2796

(314) 962-3145
FAX (314) 962-8650

August 9, 2004

General Warranty to Orf Construction
For the McKnight Road Church of Christ
2515 S. McKnight
St. Louis, MO 63124

West Contracting Company, Inc. warrants the construction of labor, and materials for asphalt paving, concrete work, sealing and striping at the above mentioned project to be free from defects in workmanship and/or material under normal use for a period of one year from date of substantial completion. The date of substantial completion for this project was May 10, 2004.

This warranty does not cover acts of God or use beyond pavement design.

N.B. WEST CONTRACTING CO., INC.



Doug Slater, Project Manager



ELMER TESSON

ERIC TESSON

WARRANTY LETTER

May 21, 2004

Orf Construction
4317 Bridgeton Industrial Dr.
Bridgeton, MO 63044
Attn: Brian Micklewright

RE: Warranty Letter for McKnight Road Church of Christ

The following Plant Material and Labor are covered under a One (1) Year Warranty from the date of substantial completion.

<u>Qty</u>	<u>Size</u>	<u>Description</u>
5	2 1/2" Cal.	White Ash
6	6'-7'	White Pine
24	24"	Densi Yew
49	5'	Spartan Juniper
10	5 Gal.	Bar Harbor Juniper
12	8'-10'	White Pines
22	3 Gal.	Goldfinger Potentilla

****NOTE:** The warranty on sod is not less than 30 days from the date of substantial completion.**

Any questions please contact James Denman at (314) 895-4964.

HAWKINS CONSTRUCTION & FLATWORK CONTRACTING CO., INC.

221 O'Fallon Plaza
O'Fallon, MO 63366
(636) 379-5296 (636) 281-1673 Fax

8/4/04

Orf Construction
4317 Bridgeton Industrial Drive
Bridgeton, MO 63044

RE: McKnight Road Church of Christ

To Whom It May Concern:

Hawkins Constructions & Flatwork Contracting Co., Inc. will warranty workmanship only, for one year beginning May 10, 2004, for the above referenced project. The actual pour for the slab was in September 2003 and the majority of the site work was finished in March 2004. Please consider the following:

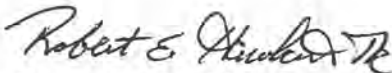
Concrete is a material subject to natural phenomena such as erosion, freezing, thawing, chipping and natural color variations. Further, the curing of concrete is a chemical reaction and the size, strength and the water content change dramatically during the first year. Shrinkage cracks during the hardening process are a common occurrence. Shrinkage cracks do not affect the integrity of the slab or wall and are to be expected.

Concrete is also subject to attack by certain chemicals. For example: pitting, spalling or scaling can occur when de-icers are placed on the slab or are dropped from a car. These are phenomena beyond the builder's control and will not be covered by the warranty.

Concrete work is subject to color variation and texture variation by the nature of materials. Repairs, when required, seldom match in color. Variation is to be expected by the customer.

Thank you for the opportunity to provide concrete flatwork.

Sincerely,



Robert E. Hawkins, Jr.
President

Martin C. Heck



BRICK CONTRACTING COMPANY

1090 Corisande Hill Road
Fenton, Mo. 63026
Phone 636-343-4636
Fax 636-305-0151

May 20, 2004

Orf Construction Co.
4317 Bridgeton Industrial Drive
Bridgeton, MO 63044

RE: McKnight Road Church of Christ

To Whom This May Concern:

Martin C Heck Brick Contracting Co. guarantees that all labor, materials, and workmanship performed by us is in accordance with the contract, drawings, specifications and alterations and additions thereto.

Should any defect develop within one (1) year from date of substantial completion, due to improper materials, workmanship or arrangement, the same will, upon written notice, be made good by us without expense to the owners.

Sincerely,

A handwritten signature in cursive script that reads "Martin C. Heck". The signature is written in black ink and is positioned above the printed name.

Martin C Heck

CRESCENT PLANING MILL COMPANY

MANUFACTURERS OF ARCHITECTURAL WOODWORK
CABINETRY AND MOLDINGS

Since 1890

3227 NORTH NINTH STREET • ST. LOUIS, MISSOURI 63147-3591
PHONE (314) 231-4118 FAX (314) 231-4430
www.crescentplaningmill.com

MAY 19, 2004

BRIAN MICKLEWRIGHT
ORF CONSTRUCTION
4317 BRIDGETON INDUSTRIAL DRIVE
ST. LOUIS, MO 63044

RE:McKNIGHT ROAD CHURCH OF CHRIST

GENTLEMEN;

WE DO HEREBY GUARANTEE/WARRANTY THE ARCHITECTURAL WOODWORK
ON THE ABOVE REFERENCED PROJECT FOR A PERIOD OF ONE (1) YEAR
COMMENCING ON THE DATE OF SUBSTANTIAL COMPLETION, MAY 10, 2004 AGAINST
FAILURES OF WORKMANSHIP, MATERIALS, ETC., IN ACCORDANCE WITH THE
REQUIREMENTS OF THE SPECIFICATIONS.

SINCERELY,
CRESCENT PLANING MILL CO., INC.



EARL J. POE III, PE
EXECUTIVE VICE PRESIDENT

CC: FILE 5310



Kehrer Brothers Construction, Inc.
Kehrer Brothers Roofing
7100 Albers Road
Albers, Illinois 62215
618-248-1333
618-248-5966
kehrerrf@ezeeweb.com

CONTRACTORS WARRANTY

PROJECT: McKnight Road Church

GUARANTEED WORK: Roofing

We hereby guarantee/warranty the Roofing Work on the above said project for a period of two (2) years against failures of workmanship, materials, etc., in accordance with the requirements of the specifications.

This guarantee does not apply to failure to perform maintenance, abuse, neglect or vandalism.

Kehrer Brothers Construction, Inc.
Kehrer Brothers Roofing

Signed: _____

Dawn Kehrer
Dawn Kehrer, President

Completion Date: 01-23-04

Sworn to and subscribed before me 18th day of August, 2004

Notary Public: _____

My commission expires: _____

Cynthia Albers

12-7-04

OFFICIAL SEAL
CYNTHIA ALBERS

NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES: 12-07-04



Single-Ply System

SERIAL NO. TS48882

DATE OF ISSUE: MARCH 19, 2004

CARLISLE GOLDEN SEAL™ TOTAL ROOFING SYSTEM WARRANTY

BUILDING OWNER: MCKNIGHT ROAD CHURCH OF CHRIST
NAME OF BUILDING: MCKNIGHT ROAD CHURCH OF CHRIST
BUILDING ADDRESS: SAINT LOUIS, MO
DATE OF COMPLETION OF THE CARLISLE TOTAL ROOFING SYSTEM: 01/23/04
DATE OF ACCEPTANCE BY CARLISLE: E B WARRANTY (03/19/04)

Warranty No. CMD030777C

Carlisle Roofing Systems, Inc., warrants to the Building Owner (OWNER) of the above described building, that; subject to the terms, conditions and limitations stated in this warranty, Carlisle will repair any leak in the Carlisle Golden Seal™ Total Roofing System (CARLISLE TOTAL ROOFING SYSTEM) installed by a Carlisle Authorized Roofing applicator for a period of 15 years commencing with the date of Carlisle's acceptance of the Carlisle Total Roofing System installation. However, in no event shall Carlisle's obligations extend beyond 15.5 years subsequent to the date of substantial completion of the Carlisle Total Roofing System. See below for exact date of warranty expiration. The Carlisle Total Roofing System is defined as the following Carlisle brand materials: Membrane, Flashings, Counterflashings, Adhesives and Sealants, Insulation, Recovery Board, Fasteners, Fastener Plates, Fastening Bars, Metal Edging, Metal Termination Bars, and any other Carlisle brand products utilized in this installation.

TERMS, CONDITIONS, LIMITATIONS

- Owner shall provide Carlisle with written notice within thirty (30) days of the discovery of any leak in the Carlisle Total Roofing System. Owner should send written notice of a leak to Carlisle's Warranty Services Department at the address set forth at the bottom of this warranty. By so notifying Carlisle, the Owner authorizes Carlisle or its designee to investigate the cause of the leak. Should the investigation reveal the cause of the leak to be outside the scope of this Warranty, investigation and repair costs for this service shall be paid by the Owner.
- If, upon inspection, Carlisle determines that the leak is caused by a defect in the Carlisle Total Roofing System's materials, or workmanship of the Carlisle Authorized Roofing Applicator in installing the same, Owner's remedies and Carlisle's liability shall be limited to Carlisle's repair of the leak.
- This warranty shall not be applicable if, upon Carlisle's inspection, Carlisle determines that any of the following has occurred:
 - The Carlisle Total Roofing System is damaged by natural disasters, including, but not limited to, lightning, fire, insect infestations, earthquake, tornado, hail, hurricanes, and winds of peak gust speeds of 72 mph or higher measured at 10 meters above ground, or
 - The Carlisle Total Roofing System is damaged by any intentional or negligent acts, accidents, misuse, abuse, vandalism, civil disobedience, or the like.
 - Deterioration or failure of building components, including, but not limited to, the roof substrate, walls, mortar, HVAC units, non-Carlisle brand metal work, etc., occurs and causes a leak, or otherwise damages the Carlisle Total Roofing System; or
 - Acids, oils, harmful chemicals and the like come in contact with the Carlisle Total Roofing System and cause a leak, or otherwise damage the Carlisle Total Roofing System.
- This Warranty shall be null and void if any of the following shall occur:
 - If, after installation of the Carlisle Total Roofing System by a Carlisle Authorized Roofing Applicator there are any alterations or repairs made on or through the roof or objects such as, but not limited to, structures, fixtures, or utilities are placed upon or attached to the roof without first obtaining written authorization from Carlisle; or
 - Failure by the Owner to use reasonable care in maintaining the roof, said maintenance to include, but not be limited to, those items listed on Carlisle's Care & Maintenance Information sheet which accompanies this Warranty.
- Only Carlisle brand insulation products are covered by this warranty. Carlisle specifically disclaims liability, under any theory of law, for damages sustained by or caused by non-Carlisle brand insulation products.
- During the term of this Warranty, Carlisle shall have free access to the roof during regular business hours.
- Carlisle shall have no obligation under this Warranty while any bills for installation, supplies, service, and warranty charges have not been paid in full to the Carlisle Authorized Roofing Applicator, Carlisle, or material suppliers.
- Carlisle's failure at any time to enforce any of the terms or conditions stated herein shall not be construed to be a waiver of such provision.
- Carlisle shall not be responsible for the cleanliness or discoloration of the Carlisle Total Roofing System caused by environmental conditions including, but not limited to, dirt, pollutants, or biological agents.
- Carlisle shall have no liability under any theory of law for any claims, repairs, restoration, or other damages including, but not limited to, consequential or incidental damages relating, directly or indirectly, to the presence of any irritants, contaminants, vapors, fumes, molds, fungi, bacteria, spores, mycotoxins, or the like in the building or in the air, land, or water serving the building.
- This Warranty is not assignable by operation of law or otherwise. Application may be made by a new building owner for reissuance of the warranty during the original warranty period. Certain procedures including, but not limited to, an inspection of the Roofing System by a Carlisle representative and fees will apply to any reissuance. Carlisle reserves the right, in its sole discretion, to refuse to reissue this warranty.

CARLISLE DOES NOT WARRANT PRODUCTS UTILIZED IN THIS INSTALLATION WHICH IT HAS NOT FURNISHED; AND SPECIFICALLY DISCLAIMS LIABILITY, UNDER ANY THEORY OF LAW, ARISING OUT OF THE INSTALLATION AND PERFORMANCE OF, OR DAMAGES SUSTAINED BY OR CAUSED BY, PRODUCTS NOT FURNISHED BY CARLISLE.

THE REMEDIES STATED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES FOR FAILURE OF THE CARLISLE TOTAL ROOFING SYSTEM OR ITS COMPONENTS. THERE ARE NO WARRANTIES EITHER EXPRESSED OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY, WHICH EXTEND BEYOND THE FACE HEREOF. CARLISLE SHALL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR OTHER DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR DAMAGE TO THE BUILDING OR ITS CONTENTS UNDER ANY THEORY OF LAW.

BY: Patrick D. McGrady
 AUTHORIZED SIGNATURE.....
 TITLE: V.P., Technical & Warranty Services
 THIS WARRANTY EXPIRES: MARCH 18, 2019

Patrick D. McGrady

ROOFING AMERICA FOR OVER 40 YEARS..



P. O. Box 7000, Carlisle, PA 17013 ■ (717) 245-7000; Fax (717) 245-7053 ■ www.carlisle-syntec.com



CARLISLE ROOFING SYSTEMS REVISION AND ALTERATION PROCEDURES

1. Paragraph 4(a) of the Carlisle Roofing System Warranty states: "This warranty shall be null and void if, after installation of the Carlisle Roofing System by a Carlisle Authorized Roofing Applicator, there are any alterations or repairs made on or through the roof or objects such as, but not limited to, structures, fixtures, or utilities placed upon or attached to the roof without first obtaining written authorization from Carlisle".
2. Any questions concerning revisions or alterations to your Carlisle Roofing System must be directed to Carlisle's Technical Systems and Services Department. Carlisle must approve the proposed details prior to any revision or alteration.

Below is address information for Carlisle's Technical Systems and Services and telephone and fax numbers for your convenience.

Carlisle SynTec Incorporated
Attn: Technical Systems and Services
P O Box 7000
Carlisle, PA 17013
Telephone Number (800) 441-3433
Fax Number : (717) 245-7121 or (717) 245-7181

3. The approval process begins when Carlisle receives a shop drawing that outlines those locations where the alteration will take place. Either the Carlisle Authorized Roofing Applicator or the building owner must also notify Carlisle of the proposed alterations in writing and identify the project name, location, warranty number and the CMD or AB number originally assigned by Carlisle.
4. A Carlisle Authorized Roofing Applicator must perform all revision work. It is recommended the original applicator who installed the roofing system perform the revision work, if possible.
5. The Carlisle Authorized Roofing Applicator must notify Carlisle in writing when the revision work is complete.
6. At Carlisle's discretion, a Carlisle Technical Representative may conduct an inspection to ensure compliance with the current published Carlisle Specifications and Details. The applicator will be notified of the results. Current inspection charges and expenses will apply.
7. When the revision or alteration is completed in compliance with the above procedures, Carlisle will notify the building owner that the warranty is being continued.

The preceding care and maintenance requirements are for Sure-Seal®, Brite-Ply™, Sure-Weld™ and FleeceBACK™ Membrane Roofing Systems. Carlisle recommends that your maintenance staff and/or maintenance contractor inspect the roof periodically or at least twice a year. The inspection should concentrate on high-risk areas such as roof hatches, drains and around all rooftop equipment as well as general inspection of the entire roof. The inspector should be looking for membrane damage (cuts and tears), oil or Freon leaks, chemical spills, or water infiltration into the roofing system.

Compliance with the above listed care and maintenance requirements will aid in assuring a durable, watertight membrane roofing system.

Carlisle, Sure-Seal, Brite-Ply, Sure-Weld and FleeceBACK are trademarks of Carlisle SynTec Incorporated.

Hypalon is a Trademark of E.I. duPont de Nemours & Co., Inc.



Carlisle SynTec Incorporated

CARLISLE MEMBRANE SYSTEM WARRANTY PACKAGE

Enclosed is your Carlisle Membrane System Warranty Package. Included is repair and maintenance information.

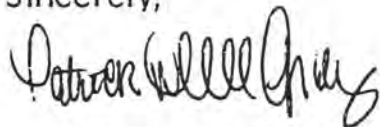
The Carlisle warranty is a promise of a quality roof, properly installed. Your roofing contractor is a Carlisle Authorized Applicator, who has been trained to install your roof according to our specifications and details. Under these conditions, your roof should give you years of satisfactory performance.

Uncompromising quality, constant innovation and a devotion to service have made Carlisle SynTec Incorporated the world's leading manufacturer of commercial and industrial single-ply roofing. From our applicator network to vitally-positioned regional offices and distribution facilities, Carlisle is **Your Single-Ply Solution™**.

Please call 1-800-4-SYNTEC if you have questions regarding your warranty or 1-800-233-0551 for any other warranty-related questions.

Don't forget to check out our web page at www.carlisle-syntec.com

Sincerely,



Patrick D. McGrady
Vice President
Technical and Warranty Services

ROOFING AMERICA FOR OVER 40 YEARS™

Carlisle SynTec Incorporated
P.O. Box 7000 • Carlisle, PA 17013
Phone (toll free): 1-800-4-SYNTEC
www.carlisle-syntec.com

© 2003 Carlisle SynTec Incorporated
Printed in the U.S.A.



Carlisle SynTec Incorporated

10-3-05

To: Jim Hyde

From Larry York

Larry York**From:** Chris Roux [croux.orfconst@sbcglobal.net]**Sent:** Monday, October 03, 2005 8:01 AM**To:** Larry York**Subject:** RE: Roof

314-413-3681 (c)

Call Jim Hyde at Hyde Sheet metal. Tell him exactly what you mentioned here. He should send someone out fairly quickly. If he does not respond, please let me know.

Thank you and have a great day!

ORF**Construction****Chris Roux**

Director

croux.orfconst@sbcglobal.net

314-298-0770 Phone

314-298-0939 Fax

-----Original Message-----

From: Larry York [mailto:LYork@mcknightroad.org]**Sent:** Sunday, October 02, 2005 3:53 PM**To:** Roux, Chris (E-mail)**Cc:** Brian Magnuson**Subject:** Roof

Chris:

During the rain storm we had last week, water started dripping through the deck at a point almost above our church secretary. I looked at the roof briefly on Thursday and found a small piece of flashing metal piercing the rubber. There may be other leaks, but this is all I saw during the time I was on the roof. I suspect this happened while the counter flashing was being installed last month. This was the first rain we had since they finished that job.

How do you suggest we handle having the roof checked and repaired.

Thank you.

Larry



WARRANTY

Effective Date: May 10, 2004

Project: McKnight Road Church of Christ

Owner: McKnight Road Church of Christ

Description: Sheet Metal

We hereby guarantee all workmanship and material on the above referenced project for a period of **One Year** from effective date.

Sincerely,

A handwritten signature in blue ink, appearing to read "James B. Hyde, Jr.", is written over the printed name.

James B. Hyde, Jr.
President

Darron L. Lawrence
President

Sondad Tuckpointing & Waterproofing, Inc.

3205 Woodson Rd. • Breckersridge, MO 63114
Office 314-423-2030 • Fax 314-423-2056

Bradley M. Lawrence
Vice President

Mathew D. Lawrence
Director of Waterproofing

Warranty

RE: McKnight Church of Christ

Warranty period: One year from date of May 10, 2004.

Warranty:

In accordance with the specifications and provisions of the general conditions the undersigned hereby warrantee to repair or replace sealant compounds, which have failed to provide airtight and watertight joints (excluding inherent qualities and limitations specified in the manufacturers data which was submitted).



Bradley M. Lawrence, Vice President

COMARCO ST. LOUIS, INC.



255 NORTHWEST BLVD ◆ FENTON, MO 63026

Phone (636)305-0520 ◆ Fax (636)305-0522

~~Bob West~~

cell 314-220-7727

~~Dave~~

8/07

507

Dave Woodhams

Greg Naylor ✓
2012

11

August 09, 2004

Orf Construction
4317 Bridgeton Ind. Dr.
Bridgeton, MO. 63044

Re McKnight Rd Church of Christ
2515 South McKnight Rd.
Ladue, MO. 63124

Gentlemen:

Comarco warrants the Finish Hardware, Hollow Metal and Wood Doors on this project to be free of defects in material and workmanship for one (1) years from date of substantial completion, which is May 10, 2004.

Our obligation under this warranty is limited to repairing or replacing material which we determine to be defective and does not cover any additional or consequential damages.

Duan Manufacturer:

VonDuprin 1-800-999-0408

Locks Mfg.:

Schlage

COMARCO ST LOUIS, INC.

Shelby Holman

Shelby Holman

COMARCO-ST. LOUIS INC.

STATEMENT

255 NORTHWEST BLVD.
 FENTON, MO 63026
 (636) 305-0520
 Fax (636) 305-0522

DATE
12/3/2012

CUSTOMER

MCKNIGHT ROAD CHURCH OF CHRIST
 2515 S. MCKNIGHT ROAD
 ST. LOUIS, MO 63124

12/6/12
3rd lvl door
digest system doghouse eyes
latch retracts
inside

Green

TERMS	AMOUNT DUE
COD	\$5,640.00

Now, latch catches if can not open from

DATE	DESCRIPTION	AMOUNT
11/09/2012	INV #45684. Orig. Amount \$5,640.00. <i>4 New doors on East entrance; 3rd lvl</i> <i>Craig installed the doors</i> <i>5-14-12 - Greg (C... - want buy</i> <i>A-1 three A-S, A = 400</i> <i>500 = 200</i> <i>A-110 = 400</i> <i>A-11 = 100</i> <i>A-11 = 100</i>	5,640.00

CURRENT	1-30 DAYS PAST DUE	31-60 DAYS PAST DUE	61-90 DAYS PAST DUE	OVER 90 DAYS PAST DUE	AMOUNT DUE
5,640.00	0.00	0.00	0.00	0.00	\$5,640.00

MAINTENANCE MANUAL

Installed at your facility is a product manufactured by Cornell Iron Works, Inc. A list of door types, quantities, and sizes are provided below for identification purposes. Cornell wants to work with owners to assure proper functioning products. We strongly suggest that these products be maintained by an experienced mechanic.

If Cornell has supplied fire doors or fire shutters, (See description below), we are informing you that codes require annual testing of these units. Annual testing is strongly recommended to ensure that the product will function properly, in the event of a fire emergency.

To obtain service, call your local Cornell distributor
EDELEN DOOR & WINDOW
6556 JONAS PL
ST LOUIS, MO 63134
Phone #: 314-521-2060
Or
The Cornell Iron Works' Service Department
800-233-8366.

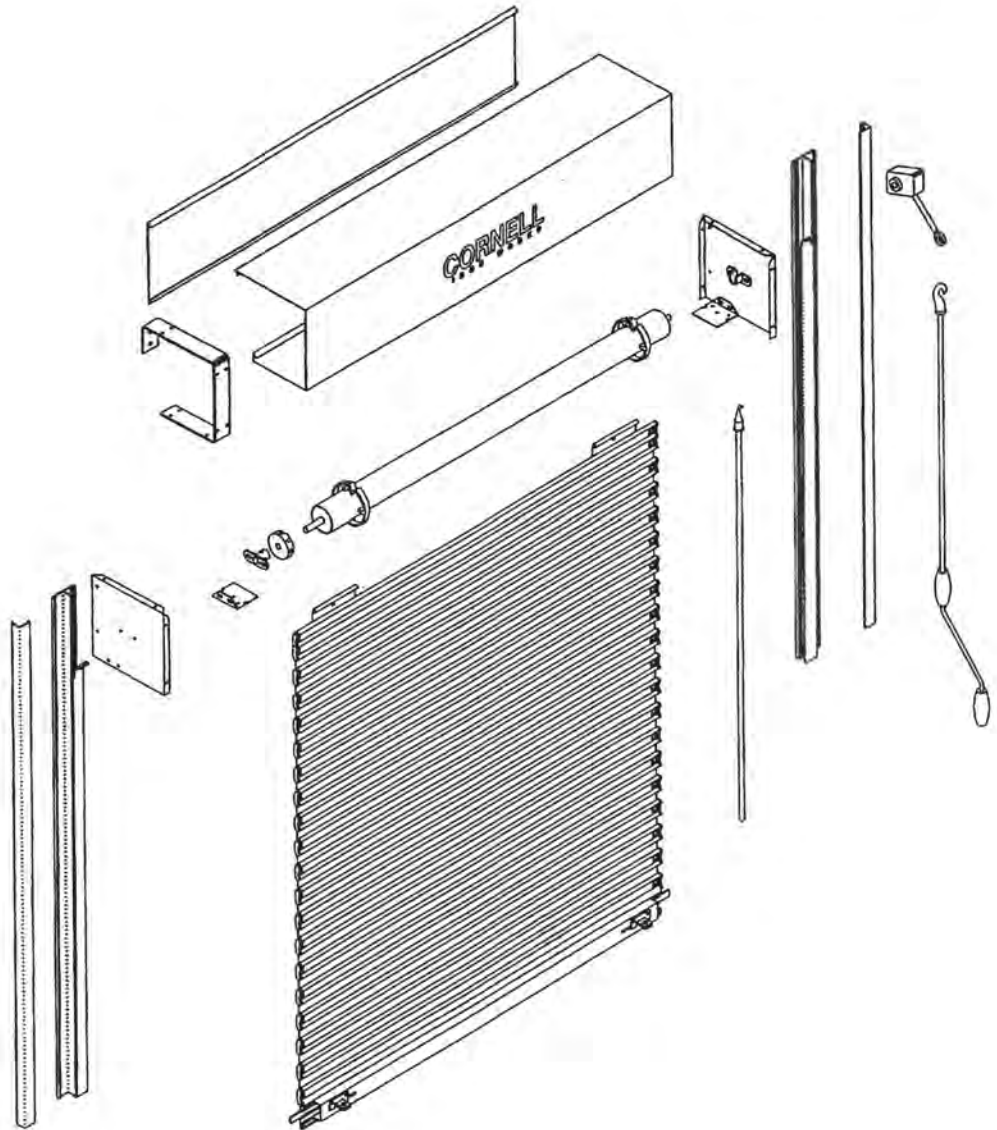
When calling, have the job serial number for identification (A serial number tag can be found on door bottom bar or on the operator bracket).

Thank you for becoming a Cornell customer.

CORNELL IRON WORKS, INC.

Operation & Maintenance Manual

Products: Counter Door 3" Shaft

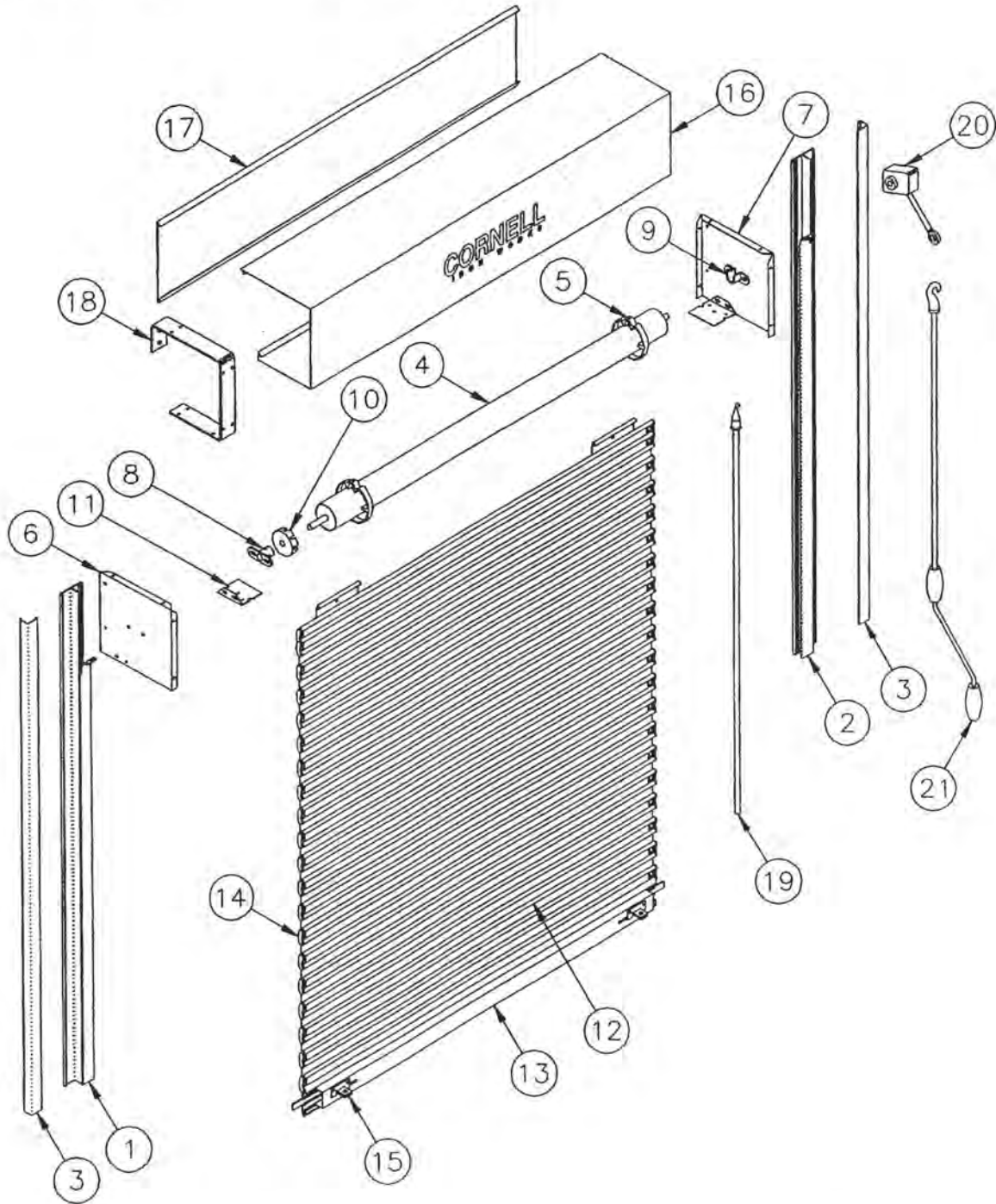


For more information...
Contact the Service Department
Please Call 800-233-8366
Or Fax 800-526-0841

PARTS LIST - COUNTER DOOR (3" TUBE SHAFT)

PUSH-UP AND HAND CRANK

LEFT HAND ADJUST SHOWN, FACING COIL SIDE



1	LEFT HAND GUIDE	8	ADJUSTOR LUG	15	SLIDE BOLT
2	RIGHT HAND GUIDE	9	IDLER LUG	16	SHEET METAL HOOD
3	GUIDE TRIM	10	ADJUSTING WHEEL	17	FASCIA (IF REQ'D)
4	COUNTERBALANCE SHAFT	11	SOFFIT CLIP ANGLE	18	HOOD SUPPORT (IF REQ'D)
5	RINGS	12	CURTAIN	19	POLE HOOK (PUSH-UP)
6	ADJUSTOR BRACKET	13	BOTTOM BAR WITH TRIM	20	BRKT MOUNTED CRANK BOX
7	OPERATOR/IDLER BRACKET	14	ENDLOCK	21	REMOVABLE HAND CRANK

COUNTER DOOR (3" TUBE SHAFT)

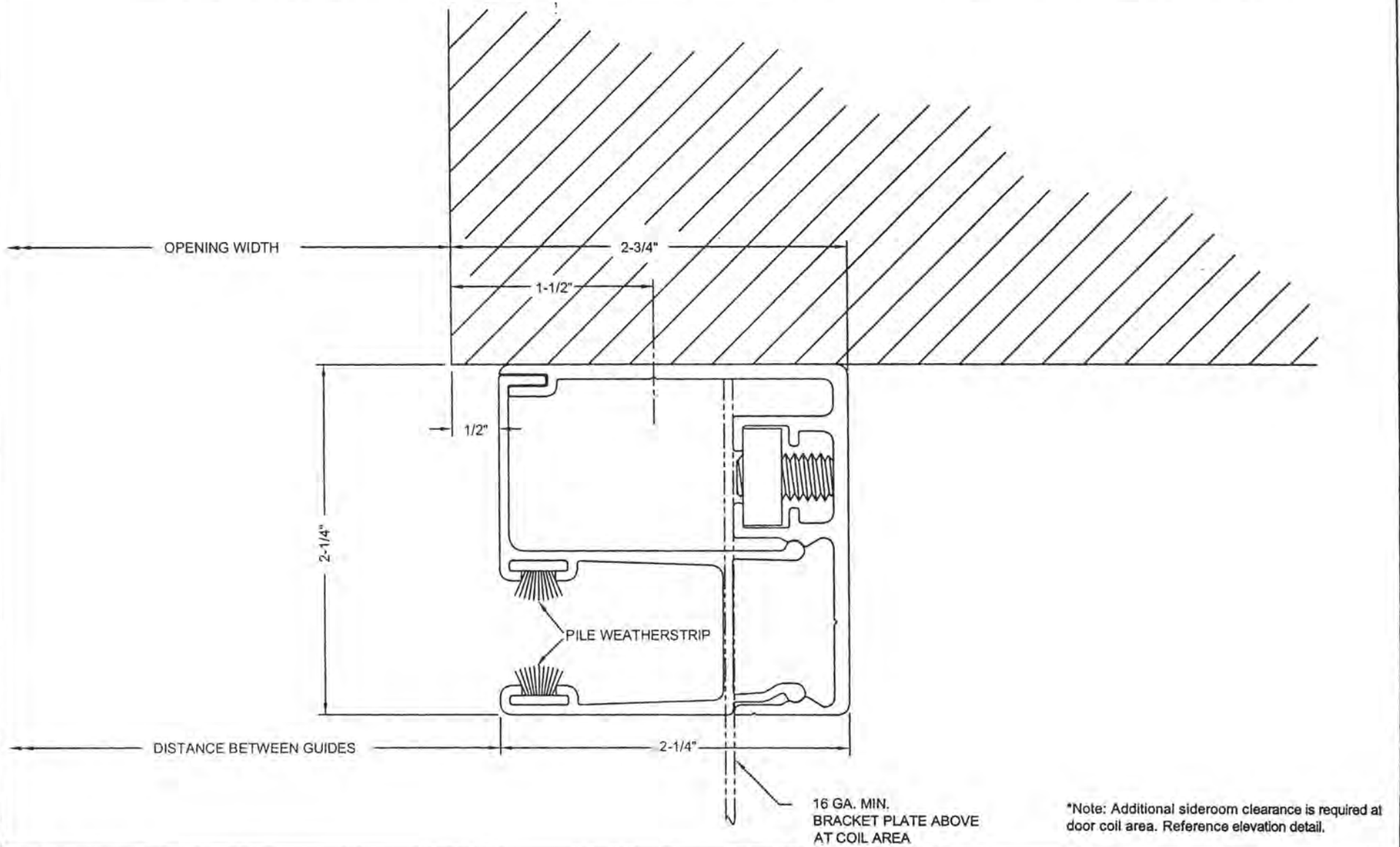
(Push-up or Hand Crank)

NOTE: Read all instructions carefully, checking shop drawings supplied for any special conditions. Open all crated materials and check with attached parts list prior to installation.

- STEP 1** Set guides with brackets plumb and see that the tops of the brackets are at the same level. Check width both at top and bottom of guides.
- STEP 2** Remove the bolt in the lug B70A of the adjusting bracket and the cotter pin from lug B33A in the opposite bracket. Place that end of the shaft which has a hole into lug B70A and drop the other end into the opposite U-shaped lug. Replace cotter pin.
- NOTE:** For crank operated units gear end shaft extension is placed in hollow shaft gear box on bracket and held in place by 1/8" x 1-1/4" long spring pin placed through hub and shaft.
- STEP 3** Remove soffit angles from both brackets and pass the curtain bottom bar first over the shaft and into the guides. Replace soffit angles. Fasten top of curtain to rings as shown.
- STEP 4** Turn adjusting wheel S41P in the direction of raising the door with a large screwdriver or similar tool. A drift pin can be used thru holes in the shaft and lug B70A to prevent spring from releasing between turns of the adjusting wheel. The number of turns required is shown on the shaft. When this is slightly exceeded the door should begin to rise. Fine adjustment can be made at quarter turn intervals. Replace the bolt in lug B70A either thru vertical or horizontal hole.
- STEP 5** Put the hood in place and fasten to angles on brackets. When hood support is required install support at center line of overall opening.

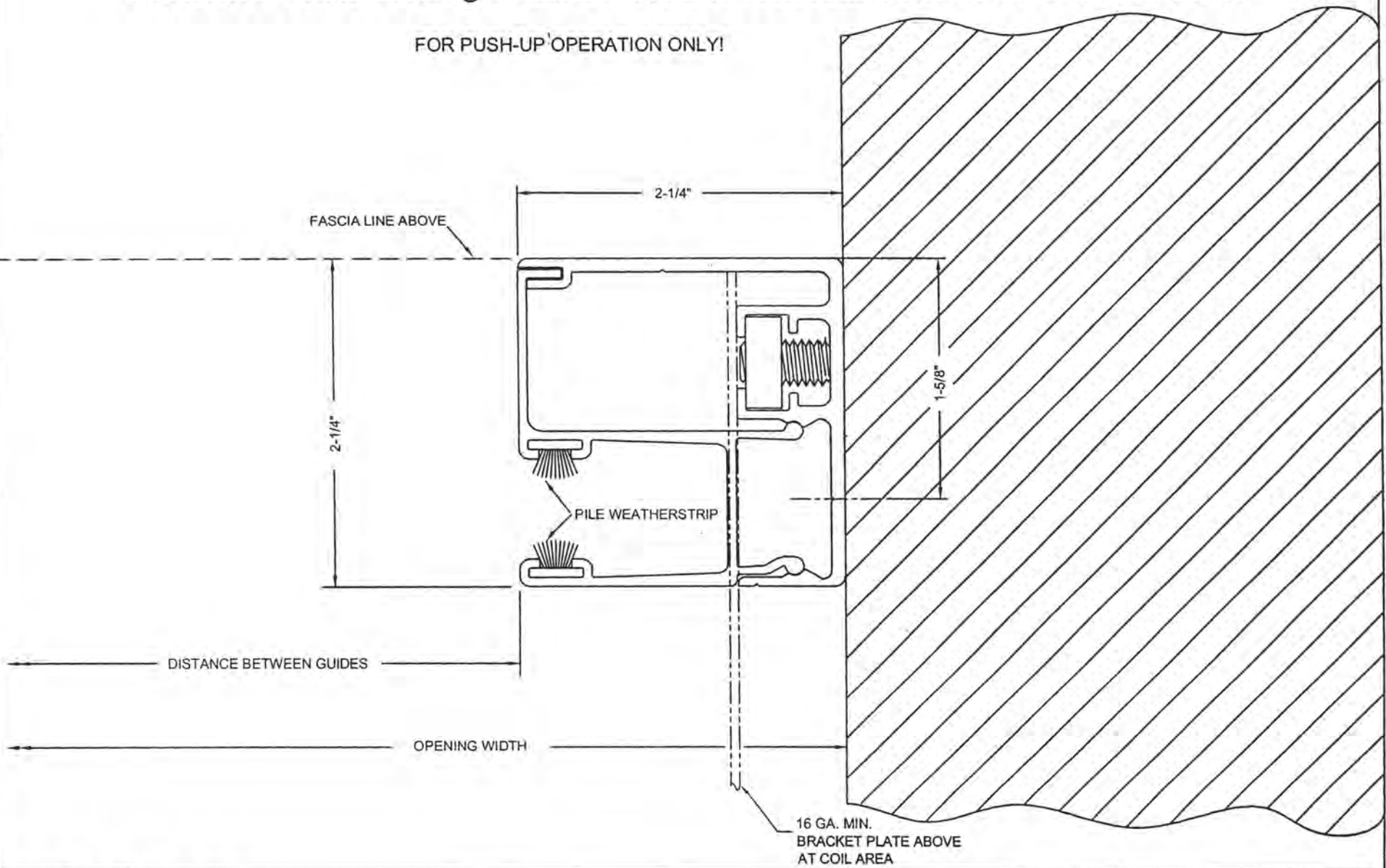


Reference Detail- Rolling Counter Door Face of Wall Mounted Extruded Guide



Reference Detail- Rolling Counter Door Between Jambs Mounted Extruded Guide

FOR PUSH-UP OPERATION ONLY!

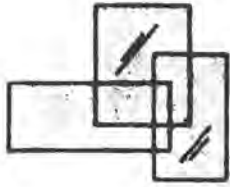


Rolling Door Specialists

CORNELL

Rev 20
©Cornell Iron Works

T3 - S1 / 4.5



West St. Louis Glass Co.

7201 OLIVE BLVD. • ST. LOUIS, MISSOURI 63130 • (314) 721-3593 • FAX (314) 721-5331

June 8, 2004

Orf Construction
4317 Bridgeton Industrial Dr.
Bridgeton, MO 63044

Re: McKnight Road Church of Christ

To Whom It May Concern:

We guarantee all materials furnished by us to be free from defective workmanship and are guaranteed for one (1) year to be structurally sound and of satisfactory appearance and with design details and installations approved by us; provided however, that we are not responsible for conditions caused by tornadoes, fires, floods, riots, commotions, negligence or willful misconduct of others in handling or use, or Acts of God.

Our guarantee is limited to replacing or repairing defective material as described herein, within one (1) year of the date of substantial completion, May 10, 2004.

West St. Louis Glass Co.

Eugene Levin, President

Warranty



P.O. Box 561 Union, MO 63084
(636) 583-1043 Fax (636) 584-1043
E-Mail Address: jasperdev@onemain.com

Project: McKnight Road Church of Christ

Guaranteed Work: Framing, drywall, & taping

Length of Guarantee: 05/10/2004 to 05/10/2005

The undersigned herewith warrants that the above work has been executed in conformance with the requirements of the contract documents (plans & specs) and guarantees said workmanship from the date of substantial completion.

This guarantee does not apply to failure to perform proper maintenance, abuse, neglect, or vandalism.

Jasper Development Carpentry & Construction Services Inc.

John J. Jasper
President

Date: 5-20-2005

FRIEND ACOUSTICAL

7696 Jim Weber Rd
Eureka, MO 63025
Phone: 636-587-2266
Fax: 636-587-7620
FriendAcoustical@yahoo.com

Warranty Letter

Orf Construction
4317 Bridgeton Industrial Drive
Bridgeton, Mo 63044

RE: McKnight Road Church of Christ

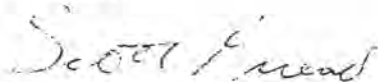
To Whom It May Concern:

Friend Acoustical hereby guarantees that all labor, materials, and workmanship performed by us is in accordance with this contract, drawings, specifications and alterations and additions.

Should any defect develop within (1) year from date of substantial completion, due to improper materials, workmanship, or arrangement, the same will, upon written notice, be made good by us without expense to the owners.

Date of substantial completion of May 10, 2004.

Sincerely,



Scott Friend
President

**Paul Abt Contract
Floor Coverings, Inc.**

(314) 241-3366
(618) 874-2552
FAX (314) 241-2710

- Since 1947 -

WARRANTY



2150 MARTIN LUTHER KING DRIVE
EAST ST. LOUIS, IL 62205-1747

PROJECT: McKnight Road Church of Christ

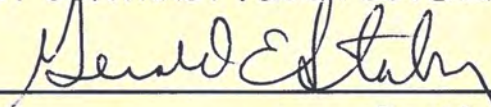
GUARANTEED WORK: Carpet and Resilient

LENGTH OF GUARANTEE: One Year from Substantial Completion

The undersigned herewith warrants that the above work has been executed in conformance with the requirements of the contract documents (plans and specifications) and guarantees said workmanship from the date of substantial completion which is May 10, 2004.

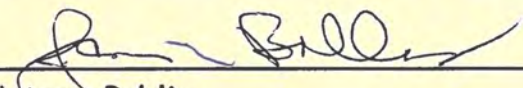
This guarantee does not apply to failure to perform proper maintenance, abuse, neglect, or vandalism.

PAUL ABT CONTRACT FLOOR COVERINGS, INC.

Signed 
Title: President

Date: May 17, 2004

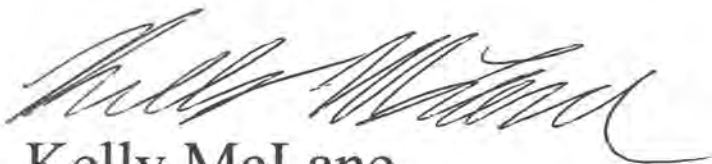
Sworn to and subscribed before me this 17th of May, 2004


Notary Public



K & M Painting & Drywall
1232 Hawkstone Ln.
St. Louis, MO 63125
314-845-6784
314-892-5667 FAX

K & M Painting & Drywall guarantees all painting products used at the McKnight Road Church of Christ for one year. The painting is guaranteed to meet the customer's satisfaction.



Kelly McLane

K & M Painting & Drywall
5/20/04



Phone: (636) 349-0290
Fax: (636) 343-5777

M. J. PRODUCTS COMPANY

403 Biltmore Dr. Fenton, Mo 63026

PARTITION WARRANTY

May 14, 2004

Orf Construction
4317 Bridgeton Industrial Drive
Bridgeton, MO 63044

RE: McKnight Road Church of Christ
M.J. Products File No. 18153

Gentlemen:

We hereby warrant and guarantee the partitions for the above referenced project for a period of one (1) year from the date of substantial completion, May 10, 2004.

We agree to repair or replace, to the satisfaction of the owner, any or all items that may prove defective in workmanship or materials within that period, (ordinary wear and tear and unusual abuse or neglect expected.)

In the event of our failure to comply with the above mentioned conditions within a reasonable time after being notified in writing, we collectively and separately do hereby authorize the owner to proceed to have defects repaired and made good at our expense and will pay the costs and charges immediately upon demand.

M.J. Products Company

A handwritten signature in blue ink that reads 'Kathleen Schulze'.

Kathleen Schulze

Towel Dispensers are made by Bradley

M.J. Products Co.
403 Biltmore
Fenton, MO 63026
(636) 349-0290
(636) 343-5777

General Care And Maintenance Of Toilet Partitions

Do not allow abrašive material, harsh cleansers, any chemical detergents or acids to come in contact with material.

Baked Enamel: To clean partitions, wash with warm water, using mild soap only. Rinse and dry thoroughly with a soft cloth. Do not allow cleaning agent to dry on finished surface. To maintain a high quality finish, it is suggested to wax material with a high quality wax recommended for baked enamel finishes.

Stainless Steel: To clean partitions, wash with warm water, using mild soap only. Rinse and dry thoroughly with a soft cloth. Do not allow cleaning agent to dry on finished surface. To maintain a high quality finish, it is suggested to wax material with a high quality wax recommended for stainless steel finishes.

Plastic: To clean partitions, wash with warm water, using mild soap only. Rinse and dry thoroughly with a soft cloth. Do not allow cleaning agent to dry on finished surface. To maintain a high quality finish, it is suggested to care for with a general-purpose protection product such as Armor All™.

Laminate: To clean partitions, wipe with a soft, damp cloth and dry thoroughly with a soft cloth. Do not allow water to dry on material. To maintain a high quality finish, it is suggested to care for with a general-purpose protection product such as Armor All™.



custom manufacturers of food service equipment

3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139-2595
314/781-3189 • FAX 314/645-7003

GENERAL GUARANTEE

Servco Equipment Company ("SERVCO") guarantees the Food Service Equipment installed for the project known as **MC KNIGHT ROAD CHURCH OF CHRIST**
PROJECT #7742

against defective material and workmanship for a period of one (1) year from the date of substantial completion:

FROM 05/10/2004 TO 05/10/2005

Servco will, during its normal working hours through one of its authorized service agencies repair or replace, at its option, including service and labor, all parts found to be defective and subject to this guarantee.

This guarantee does not apply to damage resulting from fire, water, burglary, accident, abuse, misuse, acts of God, failure to properly service or maintain equipment, attempted repairs or improper installation by unauthorized persons, field calibrations, any adjustments, and normal maintenance repairs are not covered by this guarantee.

There are no oral, statutory or implied guarantees applicable to Servco, including but limited to, any implied guarantee of merchantability of fitness for any particular purpose which extend beyond the description on the face hereof, Servco shall have no obligation or liability or any kind of character, including any obligation or liability for consequential or special damages, growing out of or with respect to the equipment of its sale, operation or use, and Servco neither assumes nor authorizes anyone else to assume for it any obligation or liability in connection with the equipment or its sale, operation or use other than as stated herein.

ADDITIONAL FOUR-YEAR COMPRESSOR GUARANTEE

In addition to the above one (1) year general guarantee, Servco guarantees all compressors against defective material and workmanship for an additional four (4) year period. This extended guarantee applies only to the motor compressor part of the condensing units. The terms of this guarantee shall run for the four-year period following the expiration of the first general guarantee. The obligation of Servco under this compressor guarantee is limited to the repair or replacement, at its option, of the refrigeration system failure is such as incorrect voltage, etc. Inspection of claimed defective compressor by Servco Equipment Co., or compressor manufacturer's authorized repair station shall be final in determining guarantee status. This guarantee does not include the cost of transportation, labor or the removal or reinstallation of any such defective compressor. This guarantee is void if a different manufacturer's motor compressor is substituted or if there is a change in the compressor size, voltage or in the refrigerant type used.

SERVCO EQUIPMENT COMPANY

BY: 

E. J. Gates, President

X parts
parts

OPERATION & MAINTENANCE MANUAL

FOR

McKNIGHT ROAD CHURCH OF CHRIST

ITEM	MODEL	DESCRIPTION	MANUFACTURER
1		STORAGE SHELVING	AMCO
2	ALT 132 WUT-FHS	REACH-IN FREEZER	TRAULSEN
3	AHT-232 WUT-FHS	REACH-IN REFRIGERATOR	TRAULSEN
4		(4) BURNER RANGE	EXISTING
5		CONVECTION OVEN	EXISTING
6	453OND	EXHAUST HOOD	CAPTIVE-AIRE
7	R-102	FIRE SUPPRESSION SYSTEM	ANSUL
8		EXHAUST FAN	NIC BY MC
9		MAKE UP AIR UNIT	NIC BY MC
10		WALL CABINET	SERVCO FAB
11		POT SINK/PREP COUNTER	SERVCO FAB
12	HSE-21	HAND SINK	UNIVERSAL
13		SOAP/TOWEL-DISPENSER	NIC
14		WORK TABLE	SERVCO FAB
15		WALL SHELF	SERVCO FAB
16		COLD FOOD STATION	NIC FUTURE
17		HOT FOOD STATION	NIC FUTURE
18		ROLLING DOOR	NIC BY ARCH.
19		STAINLESS STEEL SILL	SERVCO FAB
20		HOT FOOD CABINET	NIC
21	D122-25	DISH CART	SERVOLIFT
22		WORK TABLE W/SINK	SERVCO FAB
23	LXIH-4	U/C DISHMACHINE	HOBART
24	200-CA-ARSS	DISPOSER	SALVAJOR
25		DISPOSER CONTROL	SALVAJOR
26	SPARE NUMBER		
27		MICROWAVE OVEN	NIC BY OWNER
28		WALL CABINET	SERVCO FAB
29	SCE170A-1	ICE MACHINE	SCOTSMAN
30	SSM1	FILTER SYSTEM	SCOTSMAN

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3169

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 1 QUANTITY- LOT
DESCRIPTION- SHELVING-STORAGE
MANUFACTURER- L & P FINANCIAL SERVICES
MODEL NUMBER- AMCO II
SERVICES

**NO OPERATION AND
MAINTENANCE MANUAL AVAILABLE**

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

AMCO II STORAGE SHELVING.
(2) A 1836 ZP SHELVES.
(3) X 1836 ZP X CHANGE SHELF
(6) X 1842 ZP X CHANGE SHELF
(2) A 1824 ZP SHELVES.
(3) X 1824 ZP X CHANGE SHELF
(16) P 84 ZP POSTS

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 2 QUANTITY- 001

DESCRIPTION- FREEZER, REACH IN

MANUFACTURER- TRAUlsen/PRIDE

MODEL NUMBER- ALT 132 WUT-FHS

SERVICES

ELECTRIC-	120	VOLTS	1	PHASE	CYCLE
		KW	(MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

TRAULSEN REACH-IN FREEZER, MODEL #ALT-132 WUT-FHS. WITH APPROXIMATELY 27 CUBIC FEET OF CAPACITY. INTELA-TRAUL MICRO-PROCESSOR CONTROLS. EVAPORATOR AND CONDENSING UNIT COMPLETELY COVERED. STAINLESS STEEL EXTERIOR FRONT, DOORS AND DOOR LINERS. EPOXY COATED CORROSION RESISTANT COPPER HOT GAS LINE. BALANCE ALUMINUM INCLUDING INTERIOR. FOAM INSULATION MEETING CFC REGULATIONS. NON-CORROSIVE CONDENSATE PAN. HOT GAS LINE USED TO EVAPORATE CONDENSATION. 404A REFRIGERANT. FULL HEIGHT SOLID DOOR WITH CYLINDER LOCK. DOOR GASKETS REMOVE-ABLE WITH TOOLS. GUARANTEED FOR LIFE CAM LIFT HINGES. GUARANTEED FOR LIFE HORIZONTAL WORK FLOW DOOR HANDLE. DOOR STOP TO PREVENT DOOR SWINGING PAST 90 DEGREES POSITION. STAINLESS STEEL THERMAL BARRIER AROUND PERIMETER OF DOOR HEATERS FIVE (5) STANDARD CHROME PLATED SHELVES. COMPRESSOR COVERED BY MANUFACTURER'S FACTORY WARRANTY FOR FIVE (5) YEARS PLUS A FULL TWO (2) YEAR PARTS AND LABOR. FOUR (4) 5" DIAMETER POLYURETHANE SWIVEL CASTERS, FRONT TWO (2) WITH POSI-LOCK BRAKES. CORDSET ATTACHED. 120/1 PHASE

Traulsen & Co., Inc.



Quality Refrigeration

OWNER'S MANUAL

Instructions for the installation, operation
and maintenance of all Traulsen:

- R & A Series Reach-In & Roll-In Refrigerators
- R & A Series Pass-Thru & Roll-Thru Refrigerators
- R & A Series Reach-In & Roll-In Freezers
- R & A Series Reach-In Refrigerator/Freezers
- R & A Series Reach-In & Roll-In Hot Food Cabinets
- R & A Series Pass-Thru & Roll-Thru Hot Food Cabinets

This Traulsen unit is built to our highest quality standards. We build our refrigerators, freezers and heated cabinets this way as a matter of pride. This philosophy has made Traulsen the leader in commercial refrigeration since 1938. We thank you for your choice and confidence in Traulsen equipment and we know you will receive many years of utility from this equipment.

All Traulsen units are placed on a permanent record file with the service department. In the event of any future questions you may have, please refer to the model and serial number found on the name tag affixed to the unit. Should you need service, however, call us on our toll free number, 800-825-8220 between 7:30 am and 4:30 pm CST, Monday thru Friday. It is our pleasure to help and assist you in every possible way.

INSTALLER

COMPLETE THE FOLLOWING INFORMATION PRIOR TO UNIT INSTALLATION

INITIAL START DATE: _____ SERIAL NO. _____


MODEL TYPE: _____

COMPANY/INDIVIDUAL NAME: _____

INSTALLER: _____

TABLE OF CONTENTS



I. THE SERIAL TAG	Page 1	VII. INTELA-TRAU[®]	
II. RECEIPT INSPECTION	Page 2	a-Control Features	Page 6
III. INSTALLATION		b-Alarm Explanations	Page 7
a-Location	Page 2	c-Control Panel	Page 8
b-Packaging	Page 2	d-Parts Assembly	Page 8
c-Installing Legs or Casters	Page 2	e-Notes To The User	Page 9
d-Shelf Pins	Page 2	f-Enter The Customer Access Code	Page 9
e-Roll-In Model Installation	Page 3	g-Customer Service Parameters	Page 10
f-Installing The Condensate Evaporator	Page 3	h-Adjusting Thermostat Set Point High	Page 10
g-Remote Installation	Page 3	i-Adjusting Thermostat Set Point Low	Page 11
h-Cord & Plug	Page 3-4	j-Changing The Temperature Scale	Page 11
i-Power Supply	Page 4	k-Setting The 24-Hour Clock	Page 12
j-Wiring Diagram	Page 4	l-Setting The Date	Page 13
k-Compressor Hold Down Provisions	Page 4	m-Setting Daylight Savings Time	Page 13
l-Clearance	Page 4	n-Starting A Manual Defrost	Page 14
IV. OPERATION		o-Setting Defrost Lockouts	Page 15
a-Refrigerators	Page 4	p-Adjusting The Door Perimeter Heaters	Page 16
b-Freezers	Page 4	q-Adjusting The Room Temperature Offset	Page 16
c-Hot Food Cabinets	Page 5	r-Setting The Audible Alarm Style	Page 17
V. CARE & MAINTENANCE		s-Viewing Sensor Temperatures	Page 17
a-Cleaning The Condenser	Page 5	t-Hot Food Units - Adjusting The Thermostat	Page 18
b-Hinge Replacement	Page 5	u-Hot Food Units - Turning The Unit OFF & ON	Page 18
c-Replacing The Gaskets	Page 5	v-Hot Food Units - Temperature Adjustment	Page 18
d-Cleaning The Exterior	Page 6	VIII. TROUBLE SHOOTING GUIDE	Page 19
e-Cleaning The Interior	Page 6	IX. WARRANTY INFORMATION	Page 20
VI. MISC. OPERATIONS		X. OTHER	
a-Adjusting The Shelves	Page 6	a-Service Information	Page 21
b-Replacing The Light Bulb	Page 6	b-Spare Parts	Page 21
		c-Warranty Registration	Page 21
		XI. PARTS LIST	Page 21
		XII. INDEX	Page 22



FORT WORTH, TX.

SERIAL	MODEL	PH	
VOLTS	Hz		
TOTAL CURRENT	AMPS		
MINIMUM CIRCUIT	AMPS		
MAXIMUM OVERCURRENT PROTECTION			AMPS
LIGHTS	WATTS		
HEATERS	AMPS		
REFRIGERANT		TYPE	OZ
DESIGN PRESSURE		HIGH	LOW
REFRIGERANT		TYPE	OZ
DESIGN PRESSURE		HIGH	LOW

370-60294-00 REV (A)

I. THE SERIAL TAG

The serial tag is a permanently affixed sticker on which is recorded vital electrical and refrigeration data about your Traulsen product, as well as the model and serial number. This tag is located in the upper right interior compartment on all reach-in/pass-thru and roll-in/roll-thru refrigerator, freezer and dual-temp models. For hot food models, this tag is located on the top of the unit behind the louvers to protect it from the heat.

READING THE SERIAL TAG

- Serial = The permanent ID# of your Traulsen
- Model = The model # of your Traulsen
- Volts = Voltage
- Hz = Cycle
- PH = Phase
- Total Current = Maximum amp draw
- Minimum Circuit = Minimum circuit ampacity
- Lights = Light wattage
- Heaters = Heater amperage (Hot Food units only)
- Refrigerant = Refrigerant type used
- Design Pressure = High & low side operating pressures and refrigerant charge
- Agency Labels = Designates agency listings

II. RECEIPT INSPECTION

All Traulsen products are factory tested for performance and are free from defects when shipped. The utmost care has been taken in crating this product to protect against damage in transit. All interior fittings have been carefully secured and the legs or casters are boxed and strapped inside to prevent damage. Door keys will be attached to the handle with a nylon strip. The handle is protected by an easily removable nylon netting.

You should carefully inspect your Traulsen unit for damage during delivery. If damage is detected, you should save all the crating materials and make note on the carrier's Bill Of Lading describing this. A freight claim should be filed immediately. If damage is subsequently noted during or immediately after installation, contact the respective carrier and file a freight claim. Under no condition may a damaged unit be returned to Traulsen & Co. without first obtaining written permission (return authorization).

III. INSTALLATION

III. a - LOCATION:

Select a proper location for your Traulsen unit, away from extreme heat or cold. Allow enough clearance between the unit and the side wall in order to make use of the door stay open feature at 120° (self-closing feature operates up to 90°). The door(s) must be able to open a minimum of 90° in order to make use of the maximum clear door width available.

III. b - PACKAGING:

All Traulsen units are shipped from the factory bolted to a sturdy wooden pallet and packaged in a durable cardboard container. The carton is attached to the wooden skid with the use of large staples. These should first be removed to avoid scratching the unit when lifting off the crate.

Most exterior stainless steel surfaces have a protective vinyl covering to prevent scratching during manufacturing, shipping and installation. After the unit is installed in place of service, remove and discard the covering from all surfaces.

To remove the wooden pallet, first if at all possible, we suggest that the cabinet remain bolted to the pallet during all transportation to the point of final installation. The bolts can then be removed with a 3/4" socket wrench. Avoid laying the unit on its front, side or back for removal of the pallet.

NOTE: Traulsen does not recommend laying the unit down on its front, side or back. However, if you must please be certain to allow the unit to remain in an upright position afterwards for 24 hours before plugging it in so that the compressor oils and refrigerant may settle.

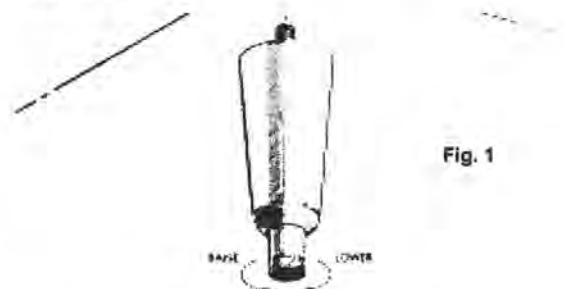
III. INSTALLATION (continued)

III. c - INSTALLING LEGS OR CASTERS:

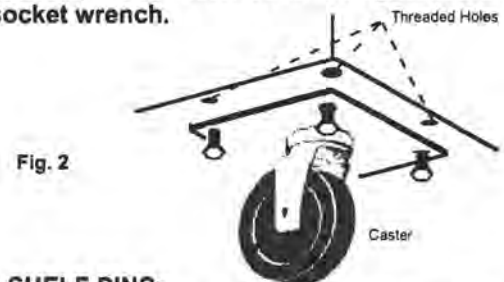
6" high stainless steel legs are supplied standard for all Traulsen reach-in and pass-thru units. Casters in lieu of legs are available as an optional accessory for the same models. These are shipped from the factory packed inside a cardboard box which is strapped to one of the shelves. Remove the nylon strap and open the box, it should contain either four (4) legs or four (4) casters and sixteen (16) bolts.

WARNING: THE CABINET MUST BE BLOCKED AND STABLE BEFORE INSTALLING LEGS OR CASTERS.

To install the legs or casters, first raise and block the reach-in a minimum of 7" from the floor. For installing legs, thread the legs into the threaded holes on the bottom of the cabinet (see figure 1). Be certain that all legs are tightly secured (legs and casters should be tightened to 300 inch/pounds, max). When the unit is set in its final position, it is important for proper operation that the unit be level. The legs are adjustable for this purpose, turn the bottom of the leg counter-clockwise to raise it, clockwise to lower it. Level the unit from front to back as well as side to side in this manner, using a level placed in the bottom of the cabinet.



Please note that Traulsen units are not designed to be moved while on legs. If the unit requires moving, a pallet jack or forklift should be used to prevent damage. For installing casters, the casters are "plate" type, and require the use of four (4) bolts each to secure them firmly to the cabinet bottom at each corner (see figure 2). The caster bolts are tightened using a 1/2" socket wrench.



III. d - SHELF PINS:

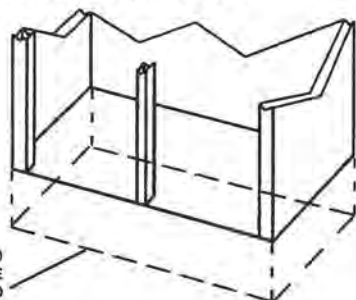
The unit is supplied with shelves and shelf pins installed. Check all shelf pins to assure they are tightened down as they may have come loose during shipping. Rotate the pins clockwise until they are secured against the side of the cabinet.

III. INSTALLATION (continued)

III. e - ROLL-IN MODEL INSTALLATION:

Roll-In cabinets set on the floor require the floor area to be flat and level. In addition, after the cabinet is set in place, sealant should be used around the perimeter of the base to comply with National Sanitation Foundation requirements (see figure 3). After sealing the unit, the enclosed ramp should then be installed.

SEALING BASE OF ROLL-IN MODELS



A SEALANT MUST BE USED AROUND THE PERIMETER OF THE BASE OF CABINET AS SHOWN TO FULLY COMPLY WITH SANITARY REQUIREMENTS.

A RECOMMENDED SEALANT IS DOW CORNING SILASTIC RTV #732

Fig. 3

A stainless steel threshold ramp(s) is included to facilitate rolling in racks. It is shipped wrapped in brown paper and secured to the rack guides inside the cabinet. To secure it in place, remove the two thumb screws in the breaker strip near the bottom door opening. Next, loosen the thumb screws located along the floor at the threshold. Place the ramp(s) on top of the loosened thumb screws and secure tabs on each end to breaker strips with thumb screws previously removed. After installing the ramp(s), it too should be sealed to the floor.

Bumper strips are secured to the back of Roll-In models with thumb screws. Loosen these and make them finger tight to conform with the requirements of the National Sanitation Foundation (NSF).

III. f - INSTALLING THE CONDENSATE EVAPORATOR:

A condensate evaporator is normally supplied on all self-contained models (remote models require provision of either a floor drain or an optional condensate evaporator). On those models with the evaporator coil compartment located on the top of the unit, the condensate evaporator is also secured to the top of the cabinet. Check that the condensate pan is under the drain tube.

Some models, such as one-section dual-temperature reach-in refrigerator/freezers, are supplied with a bottom-mounted electric condensate evaporator. This is shipped in a cardboard carton secured to the cabinet interior, and must be installed prior to use.

After the cabinet has been uncrated and the legs/casters attached, you must install the bottom-mounted electric condensate evaporator. Locate the four (4)

III. f - INSTALLING THE CONDENSATE EVAP (cont'd):

holes on the exterior bottom towards the rear of the cabinet. Then, using the four (4) screws provided, attach the mounting rails to the cabinet bottom (the end flange is to be up and be facing towards the cabinet rear). Next, place the heater into the heater bracket (note the enclosed springs are only to be used when the heater is placed on the floor). Slide heater and bracket into the mounting rails. Plug the supplied cord into both the heater on one end, and the electrical outlet provided on the cabinet exterior bottom towards the front (see figure 4). Screw the "P-Trap" on to the drain line located on the rear of the cabinet and then screw the drain extension into the "P-Trap."

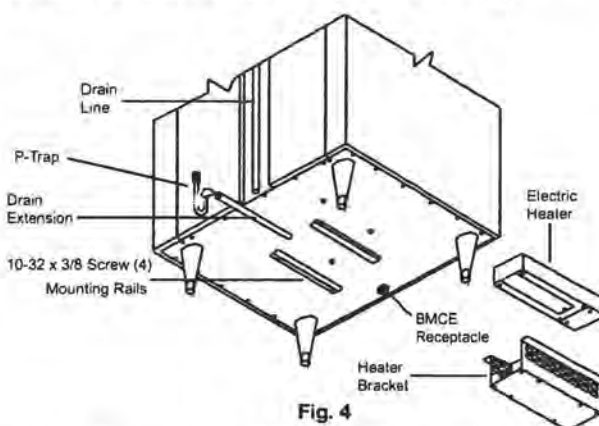


Fig. 4

NOTE: The use of the "P-TRAP" supplied is required. Failure to use this component may allow cold air to migrate down the drain line, resulting in condensation on the rear of the cabinet.

A remote model is normally supplied configured for condensate to be run to a floor drain unless purchased with a condensate evaporator. The installer is responsible for making the required extension to the floor drain in accordance with good practice and local regulations.

III. g - REMOTE INSTALLATION:

Remote models are supplied without compressors, solenoid valves, etc. The correct voltage, amp listing and refrigerant are listed on the units serial tag. It is the responsibility of the installer to specify and supply the correct size compressor(s) based upon this information and on-site requirements. Refrigerant line installation must be done in accordance with good practice and local regulations. See section "III. g" for information concerning condensate removal for remote models.

III. h - CORD & PLUG:

Most self-contained models are supplied with a cord & plug attached. It is shipped coiled at the top of the cabinet, secured by a nylon strip. For your safety and protection, all units supplied with a cord and plug include a special three-prong grounding plug on the ser-

III. INSTALLATION (continued)

III. h - CORD & PLUG (cont'd):

vice cord. Select only a dedicated electrical outlet with grounding plug for power source. **NOTE:** Do not under any circumstances, cut or remove the round grounding prong from the plug, or use an extension cord.

III. i - POWER SUPPLY:

The supply voltage should be checked prior to connection to be certain that proper voltage for the cabinet wiring is available (refer to the serial tag to determine correct unit voltage). Make connections in accordance with local electrical codes. Use qualified electricians.

Use of a separate, dedicated circuit is required. Size wiring to handle indicated load and provide necessary overcurrent protector in circuit (see amperage requirements on the unit's serial tag).

III. j - WIRING DIAGRAM:

Refer to the wiring diagram for any service work performed on the unit. Should you require one, please contact Traulsen Service at (800) 825-8220, and provide the model and serial number of the unit involved.

III. k - COMPRESSOR HOLD DOWN PROVISIONS:

To protect the compressor during transit, some self-contained Traulsen models have compressors tightened down at the factory. The hold down bolts used to tighten these must be loosened before operation to allow the vibration eliminators to function properly. Failure to loosen the hold down bolts could result in refrigerant line leakage, vibration and noise. Check the top to be sure all factory installed blocking (if used) is also removed. Likewise, check the compressor enclosure of bottom mounted units (RFD models) to be sure all packing is removed and that compressors secured to the base of condensing unit are free to operate on their vibration eliminators.

III. l - CLEARANCE:

In order to assure optimum performance, the condensing unit of your Traulsen unit **MUST** have an adequate supply of air for cooling purposes. Therefore, the operating location must either have a minimum of 12" clearance overhead of the condensing unit or allow for unrestricted air flow at the back of the unit. Clearance of at least 12" above is required in order to perform certain maintenance tasks.

IV. OPERATION

IV. a - REFRIGERATORS:

Both refrigerators and freezers do not require manual defrosting. During normal operation, a refrigerator continuously circulates above freezing cabinet air through the coil. A compressor "OFF" cycle occurs

IV. OPERATION (continued)

IV. a - REFRIGERATORS (cont'd):

every hour to melt any frost which may accumulate on the coil during the compressor "ON" cycle. The control will read "dEF" when this occurs. With standard holding refrigerators, high relative humidity is also maintained to prevent dehydration of stored product.

IV. b - FREEZERS:

During normal operation, a freezer continuously circulates below freezing cabinet air through the coil. The coil requires a periodic defrosting for proper operation. This is accomplished by an automatic, time activated, temperature/time terminated, defrost program. The controller is preset at the factory for six equally spaced defrost cycles within each 24-hour period.

At the start of a freezer defrost cycle, both the compressor and evaporator fans are OFF. The INTELA-TRAUL® control will read "dEF" (see figure 5). The electric heater (attached to the coil) is energized. When a temperature device affixed to the coil senses 70°F (models with electric defrost), the coil is fully defrosted and the compressor operation is resumed, defrost heaters are automatically turned off. The coil fans are delayed from starting at the termination of a defrost cycle. Fan operation is automatically resumed, or they can also be started by a time or temp delay (whichever comes first). In case of temp delay, it uses the same coil sensor and starts at 32°F. The total refrigeration system operation is then resumed.

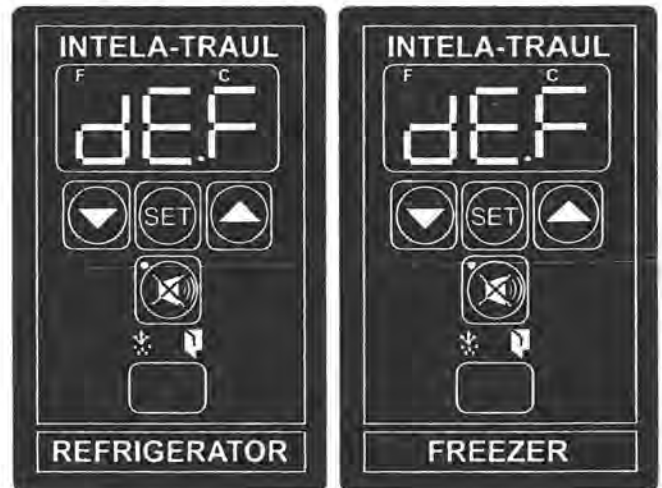


Fig. 5

During freezer defrost operation, heat is confined to the coil enclosure to prevent any significant rise in temperature within the food zone. The fan delay controls function upon termination of a defrost cycle is two-fold. First, to prevent blowing warm air into the food storage area. Second, to prevent any condensation on the defrost coil from being blown into the food storage area.

The INTELA-TRAUL® control is set from the factory to terminate defrost at 20 minutes in the event of a sensor failure. This setting should never be tampered with, without first consulting the factory.

IV. OPERATION (continued)

IV. c- HOT FOOD CABINETS:

Hot food cabinet operation is governed by the INTELA-TRAUL control, which controls the ON/OFF operation of the strip heaters. The control can be set to maintain any operational temperature between 120 - 180° F (in 5° F increments).

Hot food cabinets are delivered from the factory with the control set to the "OFF" position. Follow the instructions in section "VII. t" to get started.

NOTE: A vent is included at the top of all hot food cabinets. The vent opening is factory set and secured for best position. Be certain to make sure this vent is kept free of any obstruction.

V. CARE & MAINTENANCE

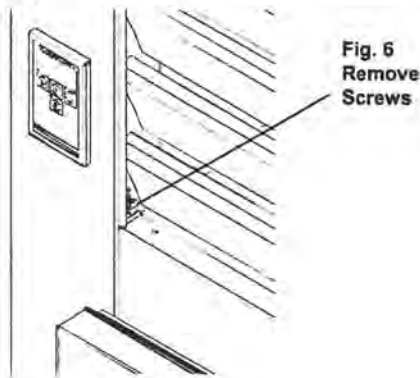
V. a - CLEANING THE CONDENSER:

The most important thing you can do to insure a long, reliable service life for your Traulsen is to regularly clean the condenser coil.

The condensing unit requires regularly scheduled cleaning to keep the finned condenser clean of lint and dust accumulation. The INTELA-TRAUL control will notify you through a "CLN-FIL" message when cleaning is necessary (see page 7). Keeping the condenser clean allows the cabinet to operate more efficiently and use less energy.

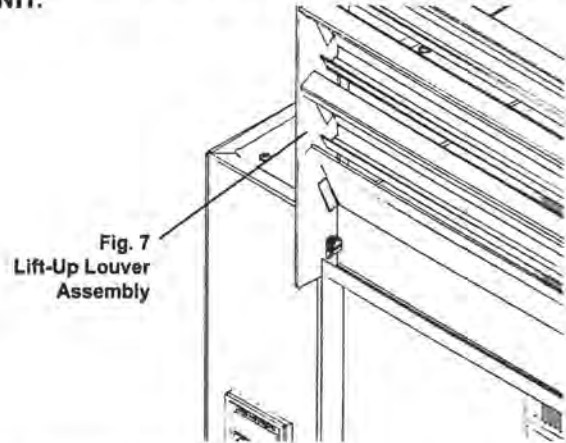
To clean the condenser, first disconnect electrical power to the cabinet and lift up the front louver assembly. To lift this, remove the two screws located on both sides at the bottom of the louver assembly (see figure 6). Once the screws are removed, the panel can be pivoted upwards allowing full access to the front facing condenser (see figure 7). Vacuum or brush any dirt, lint or dust from the finned condenser coil, the compressor and other cooling system parts. If significant dirt is clogging the condenser fins, use compressed air to blow this clear.

Lower louver assembly and replace the screws to hold it in place.



V. CARE & MAINTENANCE (cont'd)

WARNING: DISCONNECT ELECTRICAL POWER SUPPLY BEFORE CLEANING ANY PARTS OF THE UNIT.



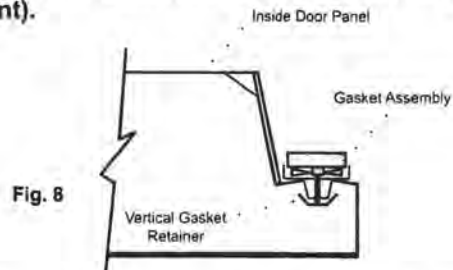
V. b - HINGE REPLACEMENT:

Both the door and hinge can be easily removed from the cabinet. To remove the door, remove the plug at the bottom of the top hinge. Inside the hinge there is a small screw which secures the door in place. Remove this with a flat head screwdriver and the door can then be lifted off the hinge. To remove the door portion of the hinge from the door, lift off the hinge cover and then remove the three Phillips head screws which secure the hinge in place on the door. To remove the cabinet portion of the hinge, remove the three Phillips head screws which hold it in place. On solid door units, the top hinge(s) contains a microswitch for controlling the interior lighting.

To reassemble the hinge reverse the previous procedure.

V. c - REPLACING THE GASKETS:

To remove the gasket to be replaced, grasp it firmly by one corner and pull it out. Before attempting to install a new gasket, both the unit and the gasket itself must be at room temperature. Insert the four corners first by using a rubber mallet (or hammer with a block of wood). After the corners are properly inserted, work your way towards the center from both ends by gently hitting with a mallet until the gasket is completely seated in place (see figure 8 for proper gasket placement).



NOTE: The gasket may appear too large, but if it is installed as indicated above it will slip into place.

V. CARE & MAINTENANCE (cont'd)

V. d - CLEANING THE EXTERIOR:

Exterior stainless steel should be cleaned with warm water, mild soap and a soft cloth. Apply with a dampened cloth and wipe in the direction of the metal grain.

Avoid the use of strong detergents and gritty, abrasive cleaners as they may tend to mar and scratch the surface. Do NOT use cleansers containing chlorine, this may promote corrosion of the stainless steel.

Care should also be taken to avoid splashing the unit with water, containing chlorinated cleansers, when mopping the floor around the unit.

For stubborn odor spills, use baking soda and water (mixed to a 1 TBSP baking soda to 1 pint water ratio).

V. e - CLEANING THE INTERIOR:

For cleaning both stainless steel and anodized aluminum interiors, the use of baking soda as described in section "V. d" is recommended. Use on breaker strips as well as door gaskets. All interior fittings are removable without tools to facilitate cleaning.

VI. MISC. OPERATIONS

VI. a - ADJUSTING THE SHELVES:

For shelves mounted on pins, first select the desired location and remove the white plastic covers in the interior back and sides by rotating them counter-clockwise. Remove the shelf pins by rotating them counter-clockwise. Install the pins in the desired location by rotating clockwise. Make sure the pin is securely tightened down. Do not over tighten. Slide the shelf into its new position, and replace the white plastic covers into the holes vacated by the shelf pins.

VI. b - REPLACING THE LIGHT BULB:

All Traulsen R & A Series models are supplied with incandescent lighting unless optional fluorescent lighting was ordered (except for sliding glass door models for which fluorescent lights are supplied standard).

The bulb is a 115 volt/40 watt, T-6½ intermediate clear refrigerator lamp. It is mounted at the top front of the cabinet at the center, and is located behind a plastic light cover. To replace, squeeze both sides of the light cover together until it comes free. Replace the light bulb. Squeeze both sides of the light cover together and replace in its original position.

VII. The INTELA-TRAUL® Control System

Your new Traulsen Refrigerator, Freezer or Hot Food cabinet is equipped with a state-of-the-art electronic microprocessor INTELA-TRAUL® control, which precisely regulates operation and provides alarms when problems occur. It is supplied from the factory completely ready for use and requires no adjustment (except Hot Food units which are set in the "OFF" position, see page for 18 for more info), but without the audible alarms activated. See pages 9 thru 17 for more information.

VII. a - INTELA-TRAUL® CONTROL FEATURES:

1- Internal Time Clock

- Eliminates defrost time clock (refrigerator and freezer models only).
- Must be set at power-up and reset after a power failure.
- Defrost cycle can be quickly adjusted to suit individual location and use.
- Will automatically update for Daylight Savings Time.

2- **Water Resistant Housing** - The face of the control is water resistant to provide for protection during cleaning.

3- Parameter/Service Levels

- See "Customer / Service Parameters" on Page 9.

4- **Defrost Lockouts** - See "Setting Defrost Lockouts" on page 15 (refrigerator and freezer models only).

- Customers can set up to 4 different defrost lockout periods. The lockout prevents the unit from going into a defrost cycle during peak kitchen use. **Note: The 24-hour clock must be set for this feature to operate correctly.**

5- **Data Storage** - The control comes equipped with 72 hours worth of data storage capability including:

- Records cabinet air temperatures every 6 minutes, needed to document "Due Diligence" in accordance with HACCP standards.
- Records alarm events.
- Records diagnostic test of each sensor every 24 hours.
- Records failed security attempts.
- Records door open cycles.
- Records defrost cycles (refrigerator and freezer models only).

Note: The 24-hour clock and the date must be set for the above information to be recorded at the correct time and date.

6- Communication Ability

An RS485 port port is available as a means of retrieving information from the stored data.

7- **Anti-Condensate Door Perimeter Heater Control** (refrigerator and freezer models only)

"No-Sweat" feature is an energy savings system that allows the customer to set the percent on time for the door heater as needed for the prevailing ambient conditions. It is used to prevent condensation from forming around the perimeter of the doors.

8- **Alarms (See the following pages for explanations)**

- High Cabinet Air Temperature
- Low Cabinet Air Temperature
- Loss Of Power
- CONDENSERCLEAN™ (refrigerator and freezer models only)*
- System Leak (refrigerator and freezer models only)*
- Door Open*
- Sensor Failure

* Not Available On Remote Models

** Not Available On Fire-Rated Or Sliding Glass Door Models

VII. INTELA-TRAUL® (continued)

VII. a - ALARM EXPLANATIONS:

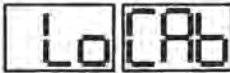
*NOTE: Explanation of alarms assume the audible alarm style is set at a 3-second burst or a continuous audible alarm. References to the audible alarm do not apply if the audible alarm style is set to OFF (Refer to page 17 for setting the audible alarm style).

The display shows the text "HI CAB" in a segmented font, with "HI" on the left and "CAB" on the right.

High Cabinet Air Temperature: The audible alarm* will sound and the display will read **HI CAB** when the temperature inside the cabinet rises above a pre-programmed limit. The limit is determined by the type of unit being operated (i.e.: refrigerator/freezer). To turn off the audible alarm*, press the alarm cancel button. The visual alarm text will continue to display until the cabinet air temperature falls below the limit. If the temperature does not fall below the limit within 5 minutes, the audible alarm* will sound again and an additional Call Service message will display.

POSSIBLE CAUSES (for Refrigerator & Freezer Models):

- Doors open for extended periods of time.
- Large amounts of hot product placed inside the cabinet.
- Condenser coil dirty.

The display shows the text "Lo CAB" in a segmented font, with "Lo" on the left and "CAB" on the right.

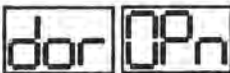
Low Cabinet Air Temperature: The audible alarm* will sound and the display will read **Lo CAB** when the temperature inside the cabinet falls below a pre-programmed limit. The limit is determined by the type of unit being operated (i.e.: refrigerator/ freezer). To turn off the audible alarm*, press the alarm cancel button. The visual alarm text will continue to display until the cabinet air temperature rises above the limit. If the temperature does not rise above the limit within 5 minutes, the audible alarm* will sound again and an additional Call Service message will display.

POSSIBLE CAUSES (for Refrigerator & Freezer Models):

- No product in unit.
- Failed sensors.

The display shows the text "ELE LOS" in a segmented font, with "ELE" on the left and "LOS" on the right.

Loss Of Power: The audible alarm* will sound and the display will read Electrical Loss, when the unit regains power after an outage. To turn off the audible alarm* and/or clear the visual text, press the alarm cancel button. You must reset the clock and date if you are using any defrost lockouts or are retrieving the information from the data storage memory. See "Setting The 24-Hour Clock" page 12 and "Setting the Date" page 13.

The display shows the text "dor OPn" in a segmented font, with "dor" on the left and "OPn" on the right.

Door Open: The door open icon on the face of the control will light and the display will read Door Open, after the door or doors have been open for 2 minutes. If the door remains open for an additional 13 minutes the audible alarm* will sound. To turn off the alarm, **close the door** or press the alarm cancel button. If the door remains open for an additional 5 minutes, the audible alarm* will sound again (n/a on fire-rated and sliding glass door models).

The display shows the text "CAL SER" in a segmented font, with "CAL" on the left and "SER" on the right.

System Leak: The audible alarm* will sound and the display will read Call Service, when the control detects a leak in the refrigeration system. To turn off the audible alarm*, press the alarm cancel button. The visual alarm text will remain until a service technician has repaired the unit. If the condition remains for 24 hours, the audible alarm* will sound again.

POSSIBLE CAUSES:

- Low refrigerant charge.
- Discharge sensor has failed low.

The display shows the text "CLn FIL" in a segmented font, with "CLn" on the left and "FIL" on the right.

CONDENSERCLEAN™: The audible alarm* will sound and the display will read Clean Filter, when the operating pressures and temperatures exceed a safe operating range. As the load on the condenser decreases, the alarm will turn off by itself. As the pressures on the condenser continues to rise, the audible alarm* will stay on for longer periods of time. To turn off the audible alarm*, press the alarm cancel button. The visual alarm text will remain until the filter/condenser has been cleaned. If the condition remains for 24 hours, the audible alarm* will sound again and visual display will read Call Service.

POSSIBLE CAUSES:

- Inadequate air flow through condenser unit.
- Discharge sensor has failed high.

The display shows the text "Snr FAL" in a segmented font, with "Snr" on the left and "FAL" on the right.

Sensor Failures: The audible alarm* will sound and the display will read Sensor Failure Call Service, when any of the unit sensors fail to operate. To turn off the audible alarm*, press the alarm cancel button. The visual alarm text will remain until the sensor has been replaced.

The display shows the text "CAL SER" in a segmented font, with "CAL" on the left and "SER" on the right.

Depending on the function of the sensor, the audible alarm* will sound again in either 5 minutes or 24 hours.

*Not available on remote models.

VII. INTELA-TRAUL® (continued)

VII. c - CONTROL PANEL:

LED FOR °F

LED FOR °C

3-DIGIT (RED)
LED DISPLAY

ALARM CANCEL
BUTTON

DEFROST ICON
W / LED

DOOR OPEN ICON
W / LED

IRDA - INFRA RED
DATA AQUISION



VII. d - PARTS ASSEMBLY: (Reach-In & Roll-In Cabinets)



COIL SENSOR*
337-60071-00
(refrigerator & freezer only)



DISCHARGE SENSOR*
337-60072-00
(refrigerator & freezer only)



CABINET SENSOR*
337-60069-00



HORN*
337-60070-00

RH SENSOR* (refrigerator & freezer only)
337-60080-00



HOLDER CLIP*
377-60038-00

DEFROST COMPRESSOR
RELAY POWER LINE IN 2
(refrigerator & freezer only)

DOOR HEATER
EVAP BLOWER RELAY
POWER IN LINE 1

TRANSFORMER RS485

DOOR RELAY

CABINET AIR

RH / EXTERNAL AIR (refrigerator & freezer only)

EVAP COIL (refrigerator & freezer only)

HOLDER CLIP

INTELA-TRAUL®**
VERTICAL CONTROLLER
337-60090-00
337-60091-00
337-60092-00
337-60098-00 (Hot Food Units)
INCLUDES ALL SHOWN
HORN

DISCHARGE LINE
(refrigerator & freezer only)



VII. INTELA-TRAUL® (continued)


VII. e - NOTES TO THE USER:


You only have 20-30 seconds between button pushes. If you take longer than 30 seconds, the controller will revert back to displaying the cabinet temperature. If you enter the wrong security code, the controller will revert back to displaying the cabinet temperature. You can exit the parameters at any time by pressing the alarm cancel button or by waiting 20-30 seconds.


VII. f - ENTER THE CUSTOMER ACCESS: This is required to set any of the control parameters


Use the security code 0, A, 1  and the following instructions:


Press the set button  . The display will read  Customer/Service Access.


Press the set button  .


The display will show three zeros with the left zero flashing 


Press the set button  .


The display will show three zeros with the center zero flashing 

Press the down arrow key  to sequence through F, E, d, C, b, A, 9, 8, 7,...etc.

When you reach A press set  .

The display will show zero, A, zero with the right zero flashing 

Press the up arrow key  to sequence through 1, 2, 3, 4, 5, 6, 7, 8, 9, A, b,...etc.

When you reach 1 press set  .
















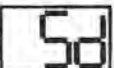
The display will read  Thermostat Set Point High.

You are now in the **CUSTOMER / SERVICE PARAMETERS.**

VII. INTELA-TRAUL® (continued)

VII. g - CUSTOMER SERVICE PARAMETERS:

Listed below are the available parameters in the order they appear, using the down arrow key on the controller. You can use either the up or down arrow keys to scroll through the options.

 SPH	Thermostat Set Point High*	 DL2	Defrost Lockout 2
 SPL	Thermostat Set Point Low	 DL3	Defrost Lockout 3
 SCL	Temperature Scale*	 DL4	Defrost Lockout 4
 ARS	Audible Alarm Style*	 DCF	Dew Point Compensation Factor*
 CL	Time (24-hour clock)*	 RO	Room Temperature Offset
 DAY	Date (month - day - year)*	 EL	Evaporator Coil Sensor
 DS	Daylight Savings *	 DL	Discharge Line Sensor
 DL1	Defrost Lockout 1	 SD	Start Manual Defrost



*Available on Hot Food units.


VII. h - ADJUSTING THE THERMOSTAT SET POINT HIGH:

This parameter sets the high point of the desired cabinet temperature range. Typically, freezers will range from -3° F to 0° F (-19° C to -18° C) and refrigerators will range from 36° F to 40° F (2° C to 4° C) for this parameter setting. This parameter is preset at the factory and does not have to be adjusted unless the customer chooses to do so. Note: Set Point Low and Set Point High **cannot** be set to the same temperature. There will be at least 1-2 degree difference between the two settings.



Follow the instructions to enter the customer access code on page 9. When the control


display reads  Thermostat Set Point High. Press the set button .

Use the arrow keys   to adjust the temperature to your desired setting.

When the display shows the temperature you want press the set button .

The display will then read  Thermostat Set Point High.

You can use the up or down arrow keys to scroll to the next parameter  



or press the alarm cancel button to exit .



VII. INTELA-TRAUL® (continued)


VII. i - ADJUSTING THE THERMOSTAT SET POINT LOW:

This parameter sets the low point of the desired cabinet temperature range. Typically, freezers will range from -6° F to -4° F (-21° C to -20° C) and refrigerators will range from 32° F to 34° F (0° C to 1° C) for this parameter setting. This parameter is preset at the factory and does not have to be adjusted unless the customer chooses to do so. Note: Set Point Low and Set Point High **cannot** be set to the same temperature. There will be at least 1-2 degree difference between the two settings.



Follow the instructions to enter the customer access code on page 9. When the control


displays **SPH** Thermostat Set High, press the down arrow key  until the control display reads **SPL** Thermostat Set Point Low. Press the set button .

Use the arrow keys   to adjust the temperature to your desired setting.

When the display shows the temperature you want press the set button .

The display will then read **SPH** Thermostat Set Point High.



You can use the up or down arrow keys to scroll to the next parameter  

or press the alarm cancel button to exit .



VII. j - CHANGING THE TEMPERATURE SCALE:


The temperature scale determines if the temperature displayed will be in degrees Fahrenheit or degrees Celsius.

Follow the instructions to enter the customer access code on page 9. When the control

displays **SPH** Thermostat Set High, press the down arrow key  until the control display reads **SCC** Temperature Scale. Press the set button .


The display will start with the current setting either **S F** for degrees Fahrenheit

or **S C** for degrees Celsius. Use the arrow keys   to toggle between the options.

When the display shows the scale you want press the set button .

The display will then read **SPH** Thermostat Set Point High.

You can use the up or down arrow keys   to scroll to the next parameter

or press the alarm cancel button to exit .



VII. INTELA-TRAUL® (continued)



VII. k - SETTING THE 24-HOUR CLOCK:


The internal timeclock must be set in order for the data storage memory to correctly log events and to allow any defrost lockout to occur at the correct time of day. If the clock is not set, the control assumes the time is 12 a.m. at the time power is supplied to the unit. The hours on a 24-hour time clock read the following way:

H01 = 1:00 a.m.	H07 = 7:00 a.m.	H13 = 1:00 p.m.	H19 = 7:00 p.m.
H02 = 2:00 a.m.	H08 = 8:00 a.m.	H14 = 2:00 p.m.	H20 = 8:00 p.m.
H03 = 3:00 a.m.	H09 = 9:00 a.m.	H15 = 3:00 p.m.	H21 = 9:00 p.m.
H04 = 4:00 a.m.	H10 = 10:00 a.m.	H16 = 4:00 p.m.	H22 = 10:00 p.m.
H05 = 5:00 a.m.	H11 = 11:00 a.m.	H17 = 5:00 p.m.	H23 = 11:00 p.m.
H06 = 6:00 a.m.	H12 = 12:00 p.m.	H18 = 6:00 p.m.	H24 = 12:00 a.m.


Follow the instructions to enter the customer access code on page 9. When the control


displays  Thermostat Set High, press the down arrow key  until the control



display reads  Clock. Press the set button .


The display will show  Hours. The right two numbers will be flashing.

Use the arrow keys   to set the hour.

When the correct hour is displayed, press the set button .

The display will show  Minutes. The right two numbers will be flashing.

Use the arrow keys to set the minutes  .

















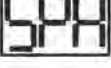



When the correct minutes are displayed, press the set button .

The display will then read  Thermostat Set Point High.





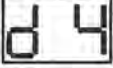









You can use the up or down arrow keys   to scroll to the next parameter
or press the alarm cancel button to exit .

VII. INTELA-TRAUL® (continued)

VII. l - SETTING THE DATE:

The date must be set in order for the data storage memory to correctly log events. Follow the instructions to enter the customer access code on page 9. When the control displays  Thermostat Set Point High, press the down arrow key  until the control display reads  Date. Press the set button . The display will show  (year). The right two numbers will be flashing. Press the arrow keys   to set the year. When the correct year is displayed, press the set button . The display will show  (month). The right two numbers will be flashing. Use the arrow keys   to set the month. When the correct month is displayed, press the set button . The display will show  (day). The right two numbers will be flashing. Press the arrow keys   to set the day. When the correct day is displayed, press the set button . The display will then read  Thermostat Set Point High. You can use the up or down arrow keys   to scroll to the next parameter, press the alarm cancel button to exit .

VII. m - SETTING DAYLIGHT SAVINGS TIME:



This parameter is preset at the factory to automatically adjust the 24-hour clock for Daylight Savings Time. Follow the instructions to enter the customer access code on page 9. When the control displays  Thermostat Set Point High, press the down arrow key  until the display reads  Daylight Savings Time. Press the set button . The display will show  Daylight Savings Time (Yes, automatically adjust for Daylight Savings Time). For "YES," press the set button , for "NO" press the up or down arrow key  . The display will read  Daylight Savings Time (no). Press the set button . The display will read  Thermostat Set Point High. You can press the the up or down arrow keys   to scroll to the next parameter or press the alarm cancel button to exit .

VII. INTELA-TRAUL® (continued)


VII. n - STARTING A MANUAL DEFROST CYCLE:

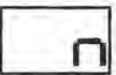
This parameter allows a service technician to start a defrost cycle at any time. This parameter will override any lockout settings.



Follow the instructions to enter the customer access code on page 9. When the control

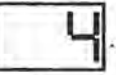
displays  Thermostat Set High, press the down arrow key  until the control


display reads  Start Manual Defrost.

Press the set button .

The display will show  (NO).


Press either arrow key   (YES).

The display will show .

Press the set button .

The display will then read  Thermostat Set Point High.

You can use the up or down arrow keys   to scroll to the next parameter


or press the alarm cancel button to exit .

Reach-In/Roll-In Models

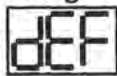


The defrost icon will be lit,

and the display will read

 when the unit is
in defrost.

DEFROST ICON

NOTE: Traulsen refrigerator units also have an off-cycle defrost once an hour, at which time the control will read . This defrost is temperature terminated and can last from 3 - 10 minutes (dEF will be displayed for 22-27 minutes).

VII. INTELA-TRAUL® (continued)

VII. 6 - SETTING THE DEFROST LOCKOUTS:

The defrost lockout parameters allow the customer to prevent the unit from going into a defrost cycle for two hours during a set timeframe. Customers can set up to four defrost lockout parameters. They are all programmed the same way. The parameters will be set for the time the lockout is to start. The controller automatically calculates 2 hours from that setting. The options are similar to the 24-hour clock settings and are in 30-minute increments. Each of the lockout parameters covers 6 hours of the 24-hour clock. Note: The 24-hour clock must be set for this feature to operate at the correct time of day. See "Setting the 24-Hour Clock" on page 12.

Sample:

OFF

020 = 2:00 a.m.

023 = 2:30 a.m.

030 = 3:00 a.m.

033 = 3:30 a.m.

040 = 4:00 a.m.

043 = 4:30 a.m.

050 = 5:00 a.m.

053 = 5:30 a.m.

060 = 6:00 a.m.

063 = 6:30 a.m.

070 = 7:00 a.m.

073 = 7:30 a.m.

080 = 8:00 a.m.

OFF

080 = 8:00 a.m.

083 = 8:30 a.m.

090 = 9:00 a.m.

093 = 9:30 a.m.

100 = 10:00 a.m.

103 = 10:30 a.m.

110 = 11:00 a.m.

113 = 11:30 a.m.

120 = 12:00 p.m.

123 = 12:30 p.m.

130 = 1:00 p.m.

133 = 1:30 p.m.

140 = 2:00 p.m.

OFF

140 = 2:00 p.m.

143 = 2:30 p.m.

150 = 3:00 p.m.

153 = 3:30 p.m.

160 = 4:00 p.m.

163 = 4:30 p.m.

170 = 5:00 p.m.

173 = 5:30 p.m.

180 = 6:00 p.m.

183 = 6:30 p.m.

190 = 7:00 p.m.

193 = 7:30 p.m.

200 = 8:00 p.m.

OFF

200 = 8:00 p.m.

203 = 8:30 p.m.

210 = 9:00 p.m.

213 = 9:30 p.m.

220 = 10:00 p.m.

223 = 10:30 p.m.

230 = 11:00 p.m.

233 = 11:30 p.m.

240* = 12:00 a.m.

243* = 12:30 a.m.

010 = 1:00 a.m.

013 = 1:30 a.m.

020 = 2:00 a.m.

* Denotes not available.

A lockout cannot be programmed to start at 12:00 a.m. or 12:30 a.m. due to conflicts with other internal programs. The defrost lockouts cannot be programmed to run back-to-back. For example, if dL1 is set to 080, then a defrost cycle would be locked out from 8:00 a.m. to 10:00 a.m. Because of the dL1 setting the dL2 parameter would not let the user choose a lockout start time before 10:30 a.m. All lockouts are preset at the factory to OFF.

Follow the instructions to enter the customer access code on page 9. When the control

displays Thermostat Set High, press the down arrow key until the control the

control display reads or . Press the set button .

The display will show Off. Press the arrow keys to set the start time.

When the correct time is displayed, press the set button .

The display will then read Thermostat Set Point High.

You can press the up or down arrow keys to scroll to the next parameter












or press the alarm cancel button to exit .

VII. INTELA-TRAUL® (continued)

VII. p - ADJUSTING THE DOOR PERIMETER HEATERS:

This parameter allows the customer to turn ON and OFF the anti-condensate door perimeter heaters. This parameter is set to the highest setting (100) at the factory so that the door heaters stay on continuously. If you choose to have the door heaters cycle on and off, lower this parameter to approximately 30. If condensation forms around the doors, increase the parameter until condensation stops. The exact setting will vary depending on ambient conditions. This feature is not available on undercounter models.












Follow the instructions to enter the customer access code on page 9. When the control displays

 Thermostat Set High, press the down arrow key  until the control display reads 
DewPoint Compensation Factor. Press the set button . Press the arrow keys   to
adjust the factor to your desired setting. When the display shows the factor you want press the set
button . The display will then read  Thermostat Set Point High. You can use the up or
down arrow keys   to scroll to the next parameter or press the alarm cancel button to exit
.

VII. q - ADJUSTING THE ROOM TEMPERATURE OFFSET:

The room temperature offset parameter allows a service technician or end user the ability to have the display show a temperature that is within three degrees of the actual temperature being read by the cabinet air sensor. This allows for continuity of reading between different temperature reading devices. (i.e.: thermistor Vs thermocouple Vs handheld thermometer) This parameter is preset at the factory to "0" or no offset.

Follow the instructions to enter the customer access code on page 9. When the control displays



 Thermostat Set High, press the down arrow key  until the control display reads 
Room Temperature Offset. Press the set button . Use the arrow keys   to adjust the
offset to your desired setting. When the display shows the offset you want press the set button .
The display will then read  Thermostat Set Point High. You can use the up or down arrow
keys   to scroll to the next parameter or press the alarm cancel button to exit .



VII. INTELA-TRAUL® (continued)





VII. r - SETTING THE AUDIBLE ALARM STYLE:

This parameter will allow the customer to turn on/off the audible alarm feature on the INTELA-TRAUL® control. The audible alarm is preset from the factory to OFF. The customer can choose between an audible alarm that sounds for 3 seconds then automatically turns off, or a continuous audible alarm that must be manually acknowledged. Regardless of this feature's setting, visual alarm text will display when conditions warrant.

To adjust this setting, follow the instructions to enter the customer access code on page 9. When the

control displays **SPH** Thermostat Set Point High, press the up arrow key  until the display reads **AAS** Audible Alarm Style. Press the set button . The display will read **OFF** OFF.



Use the arrow keys   to scroll between **bst** for the 3-Second Audible Alarm Burst or **Cnt** for Continuous Audible Alarm. When the display shows your choice of style, press the set

button . The display will then read **SPH** thermostat Set Point High. Use the arrow keys   to scroll to the next parameter or press the Alarm Cancel Button  to exit.

VII. s - VIEWING SENSOR TEMPERATURES:

These parameters allow a service technician or customer to view the temperature of all sensors within the unit. The temperatures cannot be adjusted.

Follow the instructions to enter the customer access code on page 9. When the control displays

Thermostat Set Point High **SPH**, press the DOWN arrow key  until the display reads Evaporator Coil Sensor **EL** or Discharge Line Sensor **dl** or press the SET button .

The display will read Thermostat Set Point High **SPH**.

Press the UP or DOWN arrow keys   to scroll through the parameters or press the ALARM CANCEL button  to exit.

VII. INTELA-TRAUL® (continued)



VII. t - HOT FOOD UNITS. ADJUSTING THE THERMOSTAT & TURNING THE UNIT OFF/ON:

This parameter sets the desired cabinet temperature. Please note that hot food units are delivered from the factory set to the OFF position.




Follow the instructions to enter the customer access code on page 9. When the control reads

SPH


Thermostat Set Point High, press the set button **SET**.



Use the arrow keys   to adjust the temperature to your desired setting. When the display shows the temperature you want press the set button **SET**.

SPH




Thermostat Set Point High. You can use the up or down   arrow keys to scroll to the next parameter or press the alarm cancel button  to exit.

VII. u - HOT FOOD UNITS. TURNING THE UNIT OFF/ON:

After the temperature has been set, the customer can continuously turn the unit OFF and then back ON to the same temperature. To turn the unit ON /OFF press the alarm cancel button , (please note that this feature is not available on versions of the control manufactured prior to September 2000), or if an alarm warning condition is present, use the alternative ON/OFF activation method.

To turn the unit ON/OFF using the alternative method, press both arrows   at the same time, the set temperature will remain in memory.

VII. u - HOT FOOD UNITS. TEMPERATURE ADJUSTMENT:

Press the **SET** button **SET** and the **UP ARROW** button  at the same time. The display will flash the current temperature setting or **OFF** (if the unit is turned off). Use the **UP**  or **DOWN ARROW**  buttons to adjust your desired temperature setting (temperature range is 120° thru 180° F, and OFF) then press the **SET** button **SET**. The display will go back to reading cabinet temperature. If **OFF** is selected, the display will then read **OFF**. **NOTE:** If you wish to change the set temperature at anytime follow this procedure.

These models also include a "One-Time Temperature Setting Adjustment" feature. Upon start-up, the unit will warm-up to the last temperature you had set for it, unless changed.

VIII. TROUBLE SHOOTING GUIDE

FIND YOUR PROBLEM HERE	REMEDY
1. Condensing unit fails to start.	<ul style="list-style-type: none"> a. Check if cord & plug has been disconnected. b. Check INTELA-TRAUL® temperature setting.
2. Condensing unit operates for prolonged periods or continuously.	<ul style="list-style-type: none"> a. Are doors closing properly? b. Dirty condenser or filter. Clean properly. c. Evaporator coil iced. Needs to defrost. See instructions for setting a manual defrost cycle on page 14. d. Shortage of refrigerant, call service.
3. Food compartment is too warm.	<ul style="list-style-type: none"> a. Check door(s) and gasket(s) for proper seal b. Perhaps a large quantity of warm food has recently been added or the door was kept open for a long period of time, in both cases, allow adequate time for the cabinet to recover its normal operating temperature. c. INTELA-TRAUL® setting too high, readjust per instructions on page 10.
4. Food compartment is too cold.	<ul style="list-style-type: none"> a. Perhaps a large quantity of very cold or frozen food has recently been added. Allow adequate time for the cabinet to recover its normal operating temperature. b. Adjust the INTELA-TRAUL® to a warmer setting, see page 11.
5. Condensation on the exterior surface.	<ul style="list-style-type: none"> a. Check door alignment and gaskets for proper seal. b. Condensation on the exterior surface of the unit is perfectly normal during periods of high humidity. However, to alleviate the condition, adjust the INTELA-TRAUL® "Dewpoint Compensation Factor," see page 16.
6. Compressor hums but does not start.	<ul style="list-style-type: none"> a. Call for service.

IX. WARRANTY INFORMATION

STANDARD DOMESTIC WARRANTY

TRAULSEN & CO., INC. warrants new equipment to the original purchaser, when installed within the United States against defective material and workmanship for one (1) year from the date of original installation. Under this warranty, TRAUlsen & CO., INC. will repair or replace, at its option, including service and labor, all parts found to be defective and subject to this warranty. The compressor part is warranted for an additional four (4) years. During this period TRAUlsen & CO., INC. will supply replacement compressor(s) if deemed defective, however, all installation, recharging and repair costs will remain the responsibility of the owner.

This warranty does not apply to damage resulting from fire, water, burglary, accident, abuse, misuse, transit, acts of God, attempted repairs, improper installation by unauthorized persons, and will not apply to food loss.

THERE ARE NO ORAL, STATUTORY OR IMPLIED WARRANTIES APPLICABLE TO TRAUlsen, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. TRAUlsen SHALL HAVE NO OBLIGATION OR LIABILITY FOR CONSEQUENTIAL OR SPECIAL DAMAGES, GROWING OUT OF OR WITH RESPECT TO THE EQUIPMENT OR ITS SALE, OPERATION OR USE, AND TRAUlsen NEITHER ASSUMES NOR AUTHORIZES ANYONE ELSE TO ASSUME FOR IT ANY OBLIGATION OR LIABILITY IN CONNECTION WITH THE EQUIPMENT OR ITS SALE, OPERATION OR USE OTHER THAN AS STATED HEREIN.

INTELA-TRAUL® CONTROL WARRANTY

TRAULSEN & CO., INC. (TRAULSEN), warrants to the original purchaser of the INTELA-TRAUL® control when installed as part of the Refrigeration/Hot Food Equipment manufactured and sold by TRAUlsen, to be free of defects in material and workmanship under normal service and use for a period of two (2) years from the date of installation. Under this warranty statement, TRAUlsen will repair or exchange at TRAUlsen's discretion, F.O.B. factory, any part of said control, which proves to be defective. Inspection by the TRAUlsen Service Department of parts claimed defective shall be final in determining warranty status. The warranty is to include repair or exchange of any defective In-Warranty control or part(s) of said control for:

Part(s) – Any TRAUlsen INTELA-TRAUL® supplied part(s) found to be defective.

Labor – The labor charges from a TRAUlsen Certified Service Agent to effect the repair or exchange of the defective part(s).

"Defective Part Return" – All claimed defective part(s) must be returned to TRAUlsen for defect validation within 30 days from the date of the repair. Failure to return all claimed defective part(s) to TRAUlsen will invalidate the warranty claim, this warranty statement, and forfeit payment for those repairs effected.

This warranty does not apply to said equipment or any part thereof which has been subject to misuse, damage in transit, accident, negligence, or alteration, and will not apply if said equipment is located outside The United States.

INTERNATIONAL COMMERCIAL WARRANTY

(for Canadian warranties see domestic US warranty)

TRAULSEN & CO., INC. warrants to the original purchaser the Refrigeration Equipment manufactured and sold by it to be free from defects in material and workmanship under normal use and service for a period of one (1) year from date of shipment. Under this warranty, TRAUlsen & CO., INC. will reimburse the purchaser for the replacement of any part of said equipment (excluding dryers & refrigerant gas) which then proves to be defective. This warranty is void if said equipment or any part thereof has been subject to misuse, damage in transit, accident, negligence or alteration.

TRAULSEN'S standard warranty does not apply to Export Sales. Rather, for a period of one (1) year from date of original installation not to exceed Fifteen (15) months from date of shipment from factory, TRAUlsen:

will replace, F.O.B. factory, any defective parts normally subject to warranty.

will not cover the cost of packing, freight or labor such costs being the sole responsibility of the dealer.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EITHER EXPRESSED OR IMPLIED AND CONSTITUTES TRAUlsen'S FULL OBLIGATION AND LIABILITY. WARRANTIES NOT AVAILABLE ON REMOTE MODELS.

X. OTHER

X. a - SERVICE INFORMATION:

Before calling for service, please check the following:

- Is the electrical cord plugged in?
- Is the fuse OK or circuit breaker on?
- Is the power switch "ON"?

If after checking the above items and the unit is still not operating properly, please contact an authorized Traulsen service agent. A complete list of authorized service agents was provided along with your Traulsen unit. If you cannot locate this, you may also obtain the name of a service agent from the Service/Contact page of our website: www.traulsen.com.

If service is not satisfactory, please contact our in-house service department at:

Traulsen
4401 Blue Mound Road
Fort Worth, TX 76106
(800) 825-8220

Traulsen & Co., Inc. reserves the right to change specifications or discontinue models without notice.

X. b - SPARE PARTS:

Spare or replacement parts may be obtained through a parts supplier or one of our authorized service agents. A complete list of authorized service agents accompanies this manual and is also posted on our company's official website @ www.traulsen.com.

X. c - WARRANTY REGISTRATION:

For your convenience, the warranties on your new Traulsen unit may be registered with us by one of two methods. Completing the enclosed warranty card (shipped with the unit).

XI. PARTS LIST

PART	PART #	DESCRIPTION
Bulb, Fluorescent	337-27690-00	Replacement bulb for fluorescent light models
Bulb, Incandescent	378-29776-00	Replacement bulb for incandescent light models
Bulb Cover	337-30858-00	Replacement bulb cover for incandescent light models
Caster, 6" High	344-13140-01	Optional caster for all reach-in models
Caster, 4" High W/O Brake	SMO-28627-00	Optional lower height caster
Caster, 4" High W/Brake	SMO-28628-00	Optional lower height caster
Caster Bolt (4 req'd per caster)	351-25542-00	Bolt for above
Door Handle, Stainless Steel	344-37690-00	Replacement handle for solid door units
Door Lock, Sliding Glass	346-60005-00	Jewelers type door lock for sliding glass door model
Hinge Cam	344-28488-00	Replacement hinge cam
Hinge Cover	344-28486-00	Replacement hinge cover
Hinge, Spring Assist	SER-29021-03	Alternative hinge, spring assist
Hinge Assembly W/Stop Feature	SER-40677-02	Alternative hinge, stop feature
Hinge Assembly	SER-28583-00	Replacement hinge assembly
Key, Master	346-29467-00	Replacement key for solid door units
Leg, 4" High Adjustable	344-29558-00	Replacement or optional leg
Leg, 6" High Adjustable	344-13168-01	Replacement leg
Shelf Pin	344-24759-00	Replacement shelf pin
Shelf Clip	344-08982-00	Replacement shelf clip for pilasters
Tray Slide, #4 Chrome Rod Type	340-04842-00	Tray slide for rim support of 18" x 26" pan
Tray Slide, Universal	719-07805-00	Tray slide for 18" x 26", 14" x 18" or 12" x 20" pan
Tray Slide, #1	719-20236-00	Tray slide for 18" x 26" or 14" x 18" pan

XII. INDEX

A		R	
Alarms	6	Remote Installation	3
Audible Alarm Styles	10, 17	Return Authorization	2
B		Roll-In Models	3
C		Room Temperature Offset	16
Cleaning	5, 6	S	
Casters	2	Sealant	3
Condensate Evaporator	3	Serial Tag	1
Cord & Plug	3	Shelf Pins	2, 6
Compressor Hold Down Provisions	4	Shelves	2, 6
Condenser Clean	7	Smart Recovery	6
Clearance	4	Smart Defrost	6
Customer Access Code	9	Strip Heaters	5
Customer Service Parameters	10	I	
D		Thermostat Set Point High	10
Daylight Savings Time	13	Thermostat Set Point Low	11
Defrost	4	Threshold Ramp	3
Defrost Lockouts	6, 15	U	
Data Storage	6	U-Trap	3
E		V	
F		Vinyl, Protective Covering	2
G		W	
Gaskets	5	Warranty	20
H		Warranty, Registration	21
Hinge	5	Water Resistant Housing	4
I		Wiring Diagram	6
Internal Time Clock	6	X	
INTELA-TRAUL	4, 5, 4-19	Y	
J		Z	
K			
L			
Legs	2		
Light Bulb, 40 Watt	6		
Light Cover	6		
Louver Assembly	5		
M			
Manual Defrost Cycle	14		
N			
O			
P			
Power Supply	4		

HOURS OF OPERATION:

Monday thru Friday 7:30 am - 4:30 pm CST



Quality Refrigeration

Traulsen

4401 Blue Mound Road Fort Worth, TX 76106

Phone: (800) 825-8220 Fax-Svce: (817) 740-6757

Website: www.traulsen.com

SERVO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3187

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

SEE ITEM # 2

ITEM NUMBER- 3 QUANTITY- 001

DESCRIPTION- REFRIGERATOR, REACH IN

MANUFACTURER- TRAUlsen/PRIDE

MODEL NUMBER- AHT-232 WUT-FHS

SERVICES

ELECTRIC-	120	VOLTS	1	PHASE	CYCLE	
		KW	(MOTORS)	1/2	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

TRAULSEN REACH-IN REFRIGERATOR, MODEL # AHT-232-WUT-FHS WITH APPROXIMATELY 48 CUBIC FEET OF CAPACITY. INTELA-TRAUL MICRO-PROCESSOR CONTROLS. 1/2 HP AND RATED 4200 BTU AT 90 DEGREE AMBIENT AND 20 DEGREE EVAPORATOR TEMPERATURE. EVAPORATOR & CONDENSING UNIT COMPLETELY COVERED. STAINLESS STEEL EXTERIOR FRONT, DOORS AND DOOR LINERS. EPOXY COATED CORROSION RESISTANT COPPER HOT GAS LINE. BALANCE ALUMINUM INCLUDING INTERIOR. FOAM INSULATION MEETING CFC REGULATIONS. 120 VOLT, 1 PHASE. NON-CORROSIVE CONDENSATE PAN. HOT GAS LINE USED TO EVAPORATE CONDENSATION. 134A REFRIGERANT. FULL HEIGHT SOLID DOORS WITH CYLINDER LOCKS, HINGED RIGHT. DOOR GASKETS REMOVABLE WITHOUT TOOLS. GUARANTEED FOR LIFE CAM LIFT HINGES. GUARANTEED FOR LIFE HORIZONTAL WORK FLOW DOOR HANDLE. DOOR STOP TO PREVENT DOOR SWINGING PAST 90 DEGREE POSITION. STAINLESS STEEL THERMAL BARRIER AROUND PERIMETER OF DOOR HEATERS EIGHT (8) STANDARD CHROME PLATED WIRE SHELVES. COMPRESSOR COVERED BY MANUFACTURER'S FACTORY WARRANTY FOR FIVE (5) YEARS PLUS A FULL TWO (2) YEAR PARTS AND LABOR. FOUR (4) 5" DIAMETER POLYURETHANE SWIVEL CASTERS, FRONT TWO (2) WITH POSI-

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 2

ITEM NUMBER- 3 QUANTITY- 001

DESCRIPTION- REFRIGERATOR, REACH IN

MANUFACTURER- TRAUlsen/PRIDE

MODEL NUMBER- AHT-232 WUT-FHS

SERVICES

ELECTRIC-	120	VOLTS	1	PHASE	CYCLE
		KW	(MOTORS)	1/2	HP
					AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

LOCK BRAKES. CORDSET ATTACHED.

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 4 QUANTITY- ⁰⁰²001
DESCRIPTION- FOUR BURNER RANGE/EXIST/RELOCATE
MANUFACTURER- SERVCO - INSTALLATION
MODEL NUMBER-
SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 6 QUANTITY- 001

DESCRIPTION- EXHAUST HOOD

MANUFACTURER- CAPTIVE-AIRE SYSTEMS,

MODEL NUMBER- 4530ND

SERVICES

ELECTRIC-	120	VOLTS	1	PHASE	CYCLE
		KW	(MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

CAPTIVE AIR EXHAUST HOOD MODEL #4530ND WITH LENGTH/WIDTH AS SHOWN ON PLAN X 2'-6" HIGH. TYPE I, EXHAUST ONLY DESIGN. WALL MOUNTED AT 7'-0" ABOVE FLOOR. FIRST 12" ON PLAN AS INDICATED FOR ITEM #7, FIRE SUPPRESSION SYSTEM. 120 V/1 PHASE. WITHIN ENCLOSURE FOR THE FIRE SUPPRESSION SYSTEM, FULL HEIGHT 18 GAUGE STAINLESS STEEL WELDED HAT CHANNEL BASKETS TO RECEIVE THE FIRE SUPPRESSION CONTROL BOX AND LIQUID AGENT TANK. ACCESS TO THE FIRE SYSTEM SHALL BE BY ONE (1) PAIR OF HINGED DOORS LIFT-OFF ACCESS PANELS WILL NOT BE ACCEPTABLE. INTERIOR CAPTURE AREA FREE OF ANY SIDES. LISTING BY UL, CLASSIFIED AND HOOD ASSEMBLY FOR RESTAURANT COOKING APPLIANCE AND COMPLYING WITH THE REQUIREMENTS OF NFPA BULLETIN #96 , NSF AND THE LOCAL AUTHORITY HAVING JURISDICTION. 18 GAUGE TYPE 304 #4 FINISH STAINLESS STEEL THROUGHOUT. LIGHTER GAUGES, ALTERNATE MATERIALS OTHER THAN SPECIFIED, 400 SERIES STAINLESS STEEL AND NON-LIQUID TIGHT WELDS WILL NOT BE ACCEPTABLE. INTERIOR OF HOOD FITTED WITH 16" LONG STAINLESS STEEL U.L. CLASSIFIED BAFFLE TYPE FILTERS. ALL MOUNTED IN A SLANTED STAINLESS STEEL FRAME, RUNNING FULL

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 2

ITEM NUMBER- 6 QUANTITY- 001

DESCRIPTION- EXHAUST HOOD

MANUFACTURER- CAPTIVE-AIRE SYSTEMS,

MODEL NUMBER- 4530ND

SERVICES

ELECTRIC-	120	VOLTS	1	PHASE	CYCLE
		KW	(MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

LENGTH OF HOOD. BELOW FRAME A REMOVABLE
PITCHED GUTTER WITH REMOVABLE STAINLESS
STEEL CUP LOCATED BENEATH GUTTER.
LOCATION OF CUP WILL BE WHERE IT IS MOST
ACCESSIBLE FOR EASY REMOVABLE. EXHAUST
COLLAR AS INDICATED ON PLANS. TWO (2)
VAPOR PROOF U. L. LISTED LIGHT FIXTURES
WIRED TO COMMON RECESSED FLUSH FACE
MOUNTED SWITCH IN PANEL. ALL WIRING TO
BE OUTSIDE THE GREASE AREA OF THE HOOD.
FIXTURE SHALL COMPLY WITH THE LATEST
NATIONAL ELECTRICAL CODE. FIRE SUPPRES-
SION SYSTEM AND/OR EXHAUST HOOD PROVIDED
WITH BOTH AUDIO ALARM AND STROBE ALERT,
INSTALLED BY FOOD SERVICE EQUIPMENT
SUPPLIER. FIVE (5) GANG SWITCH WITH
INDICATOR LIGHTS FOR FANS AND LIGHTS
MOUNTED IN END WITH FIRE SUPPRESSION
SYSTEM. 18 GAUGE STAINLESS STEEL 1-1/2"
ANGLE TRIM ALONG BOTTOM AND SIDES.
APPROXIMATELY 1'-0" HIGH 18 GAUGE STAIN-
LESS STEEL ANGLE TRIM TO CEILING. PANELS
TO OVERLAP TOP OF HOOD APPROXIMATELY 1"
AND EXTEND UP TO FINISHED CEILING.
PANELS TO CLIP ONTO CONTINUOUS ANGLE AS
SPECIFIED BELOW. BEHIND PANELS RESTING
ON HOOD A 1" X 1" X 18 GAUGE GALVANIZED
CONTINUOUS ANGLE. AT CEILING A 1" X 1" X
20 GAUGE STAINLESS STEEL CONTINUOUS ANGLE

Installation, Operation, and Maintenance of Commercial Kitchen Hoods

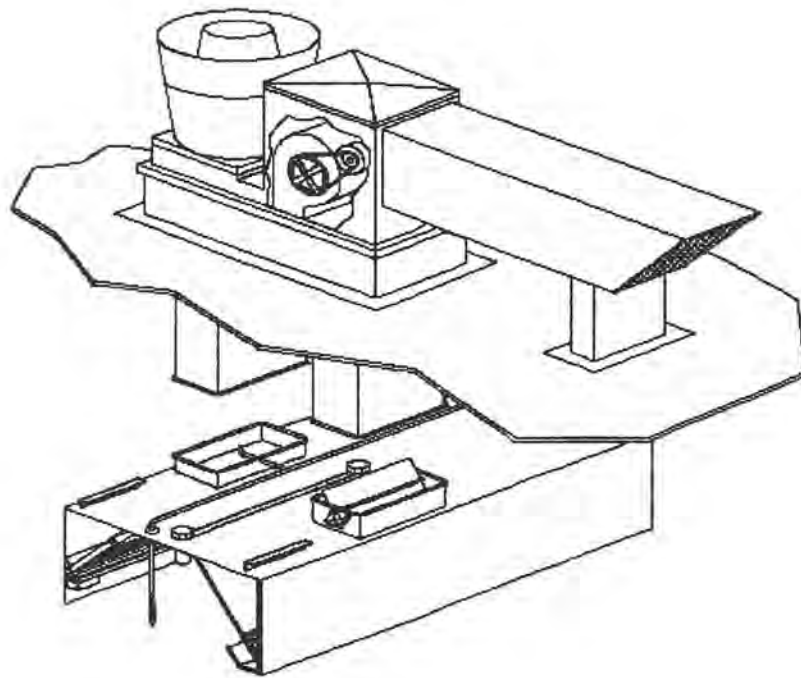


TABLE OF CONTENTS

GENERAL INFORMATION
INSTALLING THE HOOD
INSTALLING CONNECTING HOODS
INSTALLING DROP DOWN PLENUM
INSTALLING THE ENCLOSURE PANELS(WRAPPER)
INSTALLING THE ROOF TOP PACKAGE UNIT (Combined exhaust and make-up air)
INSTALLING THE MAKE-UP AIR UNIT
INSTALLING THE EXHAUST FAN UNIT
INSTALLING DUCTWORK
CLEARANCES AND CODES
WIRING THE SYSTEM
PERFORMANCE EVALUATION OF THE SYSTEM
EQUIPMENT LIST
MAINTENANCE AND OPERATION GUIDE
TROUBLESHOOTING
LIMITED WARRANTY

The manufacturer reserves the right to modify the design, materials and/or specifications as a result of code requirements or product enhancements resulting from the Company's ongoing research and development.

General Information

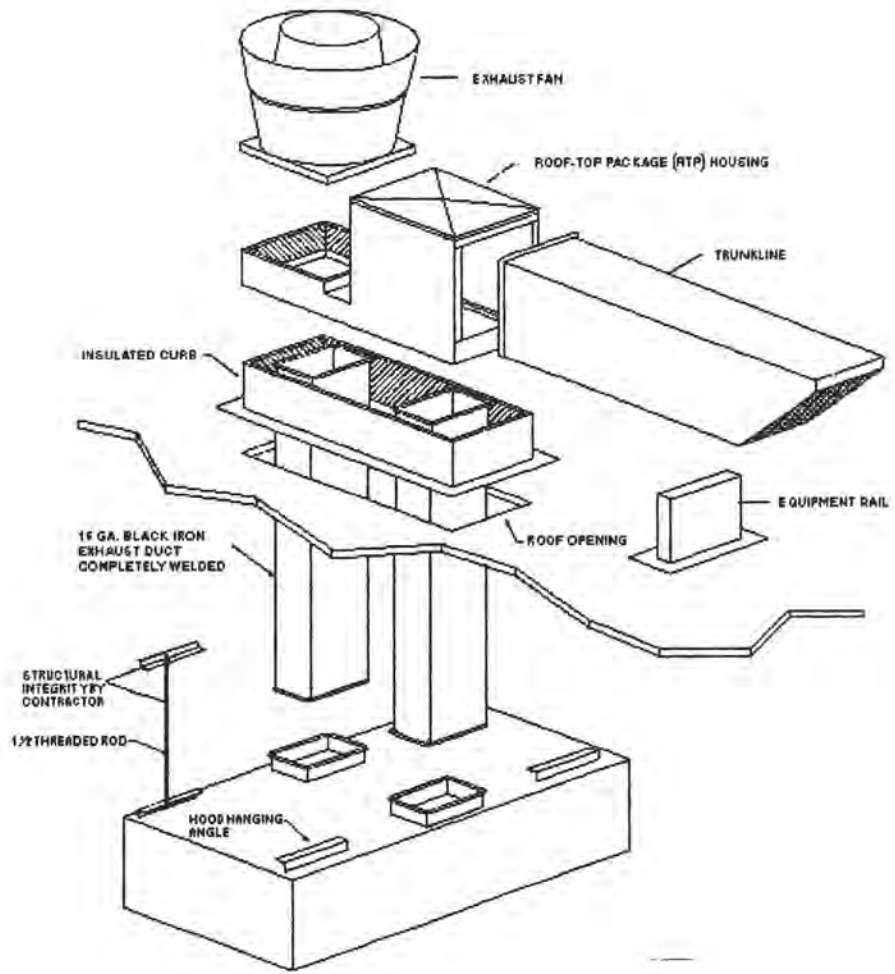
Prior to installing the stainless steel ventilation hood, the installing contractor should thoroughly review the plans and specifications of the project. The contractor should determine the exact location of the cooking hood and it should be determined if adequate room is available to install all ductwork with proper clearances from combustible material.

It is also imperative that the roof top package or curbs be installed in such a way as to minimize any offsetting in the exhaust duct system. All overhead beams or angles must be structurally strong enough to support the weight of the hood system. It is often necessary to strengthen existing structural beams, as they are not designed to carry the weight of a stainless steel hood.

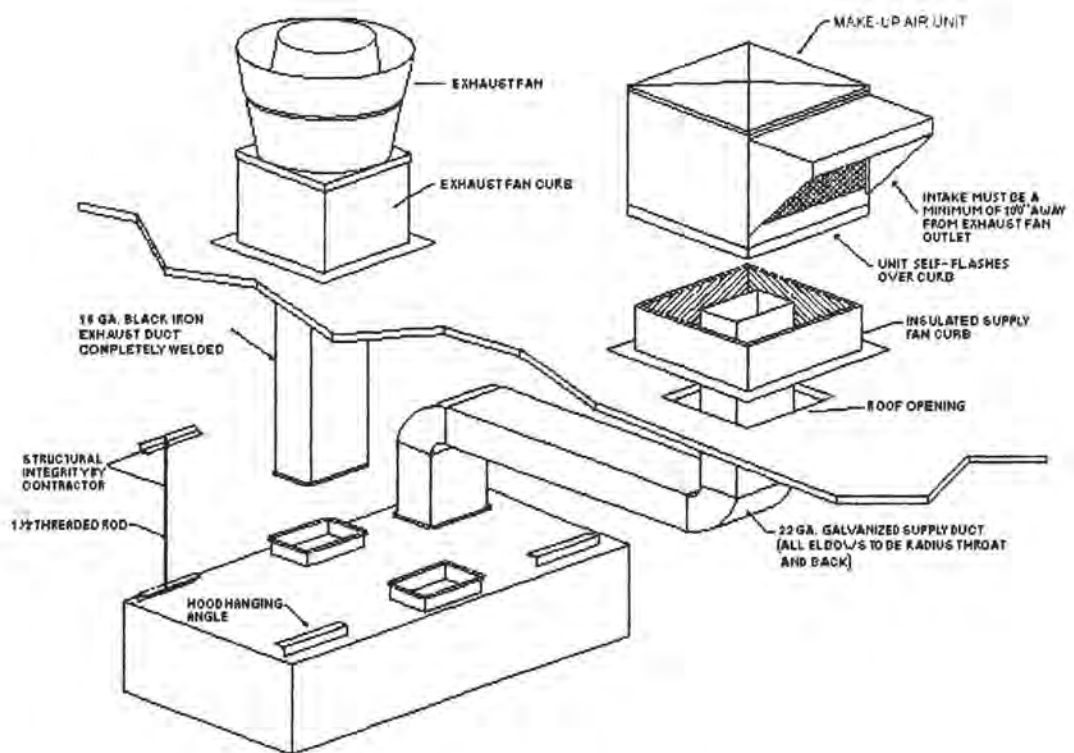
NFPA 96, BOCA, the Southern Building Code and local authorities having jurisdiction call for minimum clearances between the cooking hood, exhaust ducts and building materials which are combustible. The normal requirement between the hood, duct and combustible materials is an 18" clearance. However, this clearance can be lowered based on NFPA 96 Appendix A, BOCA or UMC Codes. It is important that you check with local authorities having jurisdiction to make sure the method of installation is suitable and satisfactory with their requirements.

A minimum of four 8" long mounting angles or two 8" long and full length mounting angle, depending on hood type, are provided with each hood. Larger hoods will have additional brackets. (The submittal drawings indicate the location of these brackets to enable the contractor to make preliminary plans for hanging the hoods.) All hoods are to be hung with 1/2" all-thread rod. Refer to the following pages for recommended hanging heights.

It is extremely important that the hood be hung level, with the supply and exhaust risers on the hood located directly beneath the openings in the roof. It is advisable to finalize the location using a plumb-bob. The following pages show exploded views of the hood with a Roof Top Package unit and the hood with separate fans.



The Hood With Roof Top Package Unit



The Hood With Separate Fans

Canopy Hood - Installing the Hood

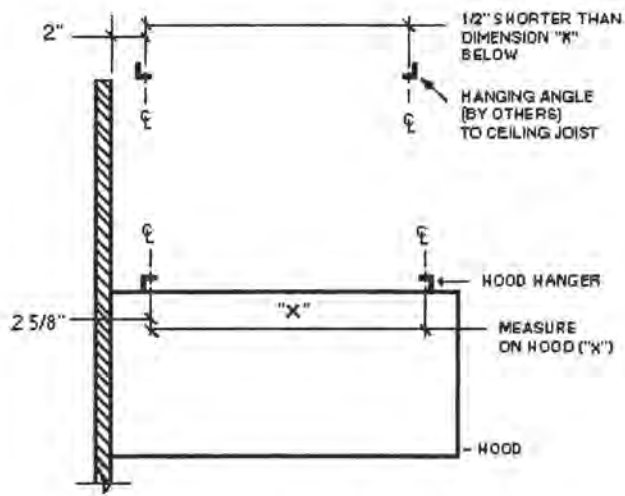
The following is a step-by-step procedure for installation of the ventilation hood.

1. Uncrate the hood, being very careful not to dent or scratch the outer surface. Report any damage to the delivering freight carrier and file a claim if appropriate. Check the nameplate on the equipment to make certain it meets the specifications provided by the architect/engineer. (If discrepancies occur, notify manufacturer immediately.) Refer to the installation drawing for typical details of the ventilation system prior to hanging hood.
2. Position hood on floor in its approximate final position.
3. Determine if modification to roof structure is necessary to accommodate both the hood weight and hood hanging system.

To approximate hood weights, use the guidelines outlined in the:

Hood Weight Index

4. Use 1/2" threaded rod to hang hoods. Drill 9/16" holes in the supporting structure to line up with the welded-on angle mounting brackets on the hood. (The structural integrity of the structural support system is the responsibility of the contractor and the structural engineer.) The hole spacing in the angle should line up with the angle on top of the hood. Refer to the sketch "Side View".
5. If hood has a back plenum, install it now. See the INSTALLING DROP DOWN PLENUM section and refer to Drop Down Plenum Installation instructions attached to the product.
6. The hood should be hung so that the bottom of the hood is 6"6" from the finished floor, unless otherwise specified by local authorities having jurisdiction. At this point, proceed to weld exhaust duct to hood while on floor, if possible. With the hood well protected against possible scratching, lift the hood into position using high lifts or equipment jacks. When the hood is elevated to the proper height, install 1/2" threaded rod between each mounting bracket on the hood and the modified support. Secure rods with heavy duty nuts and appropriately sized fender washers. Refer to sketch "Side View".
7. If hood has enclosure panels, install them now. See the INSTALLING THE ENCLOSURE PANELS (WRAPPER) section for Installation Instructions and refer to instructions attached to product.
8. The entire exhaust duct system must be continuously welded, liquid tight. The duct must be welded to the hood exhaust collar and the roof curb cap must be welded to the exhaust duct. (Ductwork installation 'By Others'.)
9. Threaded rods should be 1/2" closer to the back wall at the top hanger so as to pull the hood against the wall. Make sure the hood is level.
10. Install light bulbs (supplied by others), light globes, and grease filters in the hood.
11. Install grease cups in the studs provided.
12. Use a stainless steel polish such as "Sheila Shine" to clean the hood of dust or dirt acquired in transit.
13. It is recommended that a protective plastic coating be placed over the hood until construction is complete, so as to avoid any damage to this equipment.
14. IF HOODS ARE TO BE HUNG BACK TO BACK IN AN ISLAND CONFIGURATION, REFER TO THE SECTION "INSTALLING CONNECTING HOODS".



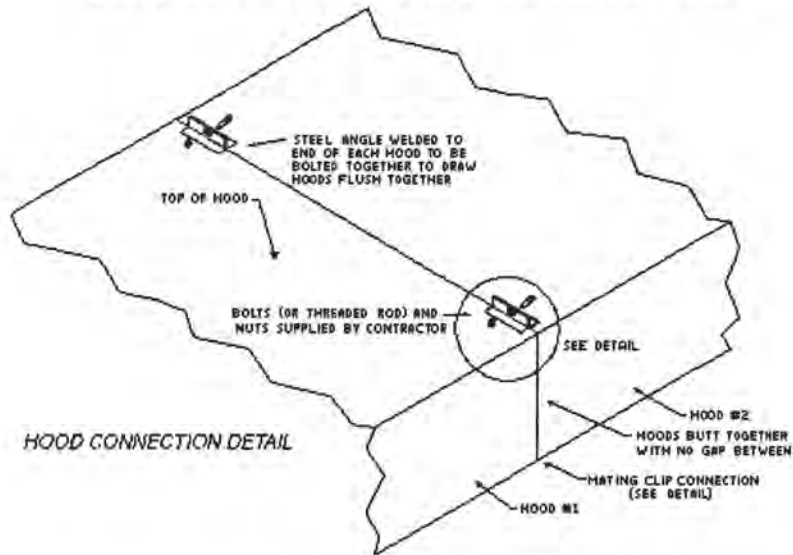
SIDE VIEW

Installation Instructions for Connecting Hoods

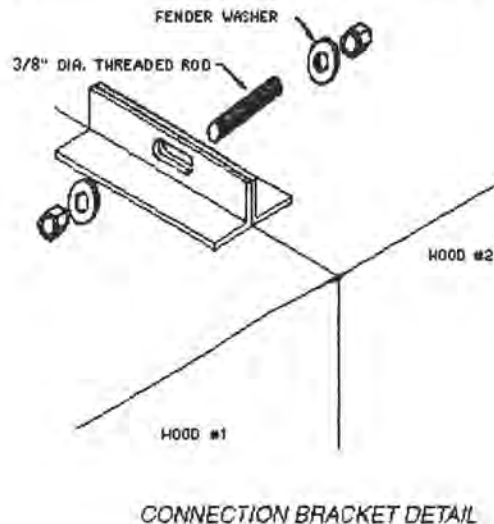
INSTRUCTIONS

- A. Hang hoods, adjusting tension on hanging rods to position hoods so they fit flush with each other (see figure 5).
- B. Bolt the tops of the hoods together by sliding a threaded rod through the mounting angle slots and holes and fastening it into position by using nuts and washers as shown in figure 2.
- C. Install end to end mating clips and back to back mating clips. Run a bead of caulk along the seam to be covered and slip the mating clip into position as shown in figures 3 & 4.
- D. The end product should resemble figure 1.

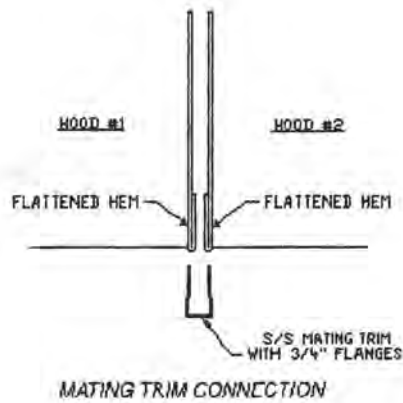
Figure 1. End to End or Back to Back Hood Connection Detail



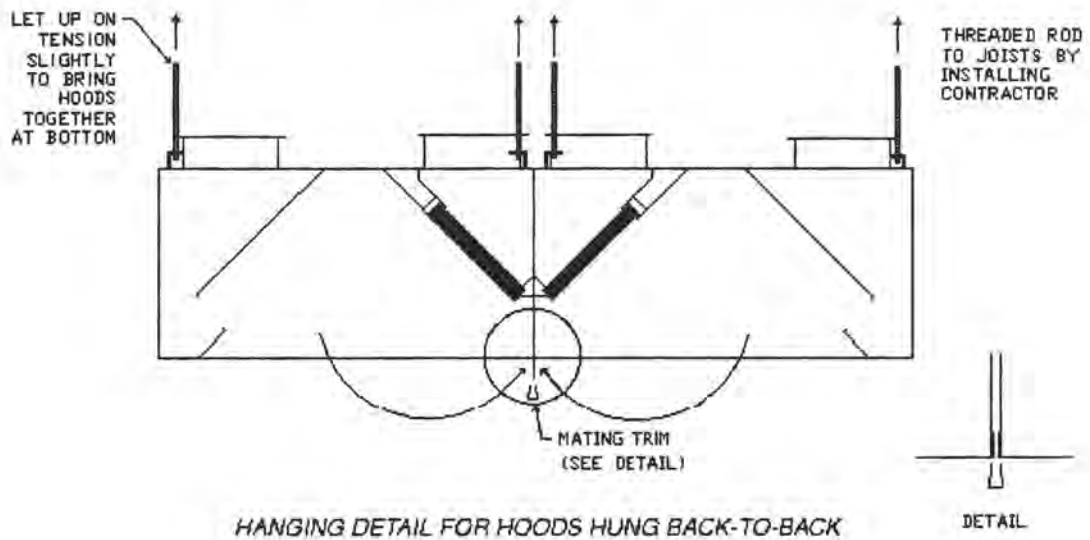
2. Exploded View of Connecting Angles on Top of Hood



3. End to End Connecting Hoods: Mating Trim Detail

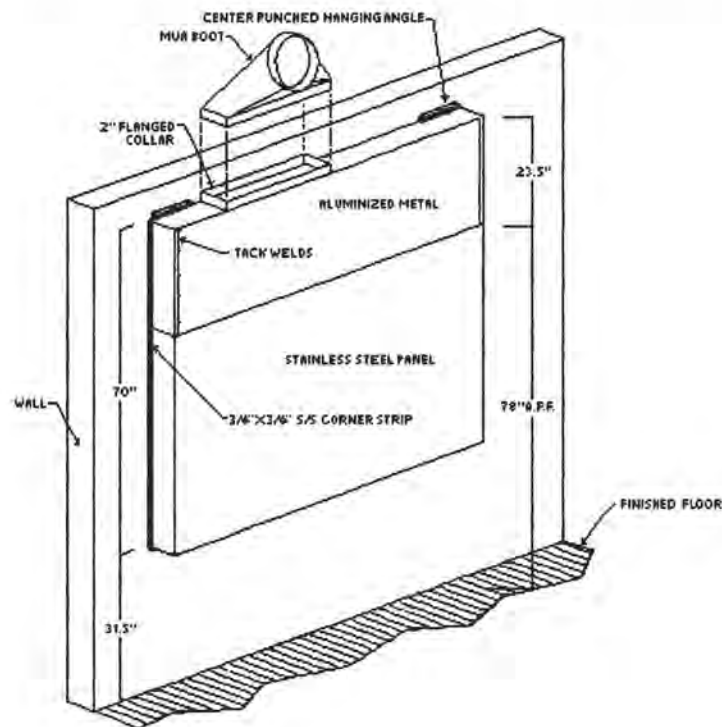


4. Back to Back Connecting Hoods: Mating Trim Detail



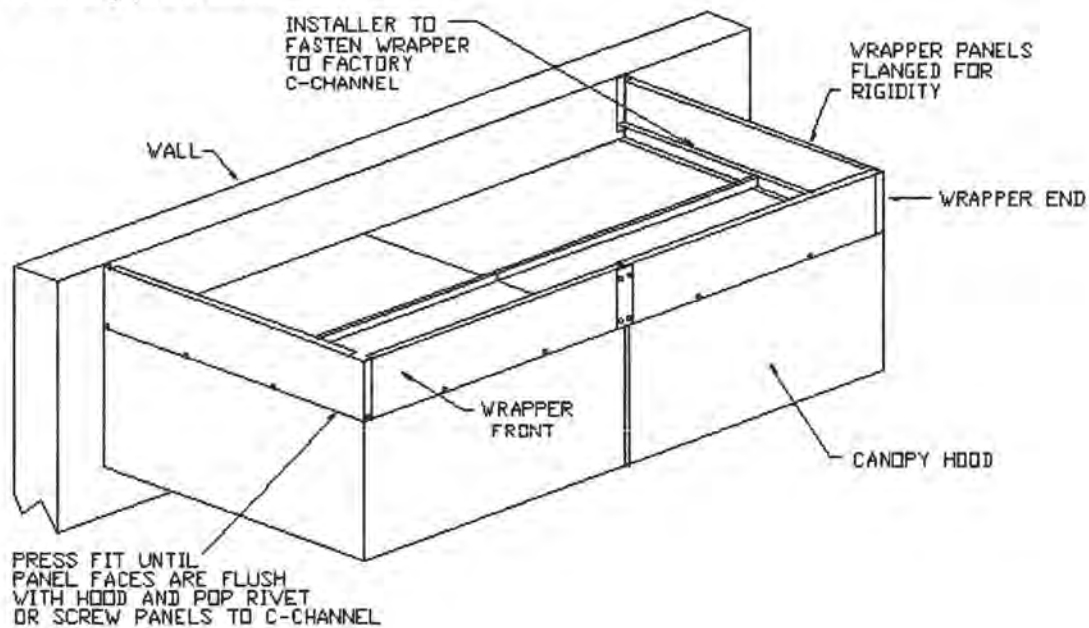
Drop Down Plenum Installation Instructions

1. Locate the assembly and unpack from the crate.
2. If the MUA risers are to be field cut, cut the risers in as desired. (Note: The manufacturer installs a 2" flange for a MUA riser. This flange is intended to slip inside a MUA boot that is supplied by the installer.)
3. Locate the wall and ceiling joists that will support the assembly.
4. Install the threaded rod and angle that will be used to hang the assembly from the ceiling joists.
5. Move the assembly into position as indicated by the markings on the product. Note the location of the 78" A.F.F. critical hanging height marking. This point should be level with the bottom back edge of the hood when it is hung later.
6. Install the threaded rod into the hood hanging angles and use heavy-duty nuts to secure the connection.
7. Caulk the seams between the wall and the drop down plenum assembly.



Installing the Enclosure Panels (Wrappers) On Canopy-Type Hoods

1. Unwrap the wrapper panels from the shipping container.
2. Locate "L" brackets if supplied. Position and fasten brackets parallel to corner of hood on the wall. Brackets should be offset at least 1/16" in from edge of hood in order for wrapper face to mount flush with the hood (Fig. 1,2)
3. Locate one of the side wrapper panels and position it on the hood so that the 3/8" flange on the bottom of panel slips underneath the C-channel on top of the hood. (Fig. 1)
Note: A notch will have to be cut on the wrapper flange using shears (tin snips) where interference occurs. (Fig. 3)
4. Press fit panel into place until wrapper face is flush with hood face. Screw or pop-rivet wrapper to the C-channel and "L" bracket. (Fig. 1)
5. Locate front wrapper panel. Position its' lower 3/8" flange under C-channel of hood and slide panel into position so that the end of front panel is behind the 90 degree bend of side panel. (Fig. 4) Once into place, press fit the lower flange of the front panel into C-channel in order to have wrapper face flush with front of hood. Screw or pop-rivet bottom of front panel to the C-channel.
6. Drill appropriate holes and rivet front to end panel. (Fig. 5)
7. If multiple panels are used (i.e. hood is side to side or back to back to another), a stainless trim will be provided to attach multiple panels together. Attach the panels by slipping them behind the stainless trim and fastening with screws or rivets. (Fig. 5)
Note: Trim length will have to be cut to fit. In most instances, trim should extend from bottom of hood to top of wrapper panel. (Fig. 6)
8. Locate the other side panel. Repeat steps 2,3,4. Pop rivet as previously done in step 5. Note: In most instances where hood is located against a side wall, fasten the front wrapper panel to the "L" bracket. A second side panel will not be shipped. Pop rivet or screw front wrapper panel to bracket. (Fig. 7)
9. Caulk all gaps and seams.



COMPLETED WRAPPER ASSEMBLY

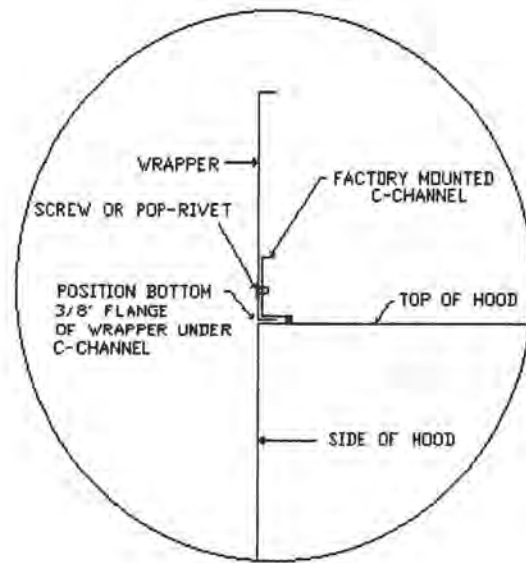


FIG. 1 WRAPPER DETAIL

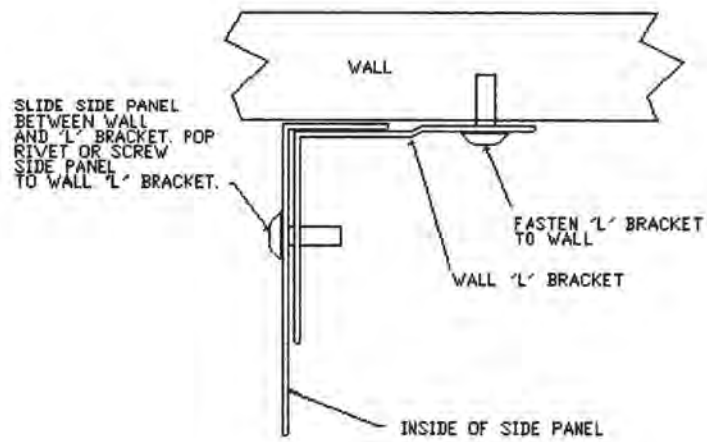


FIG. 2 WALL ANGLE

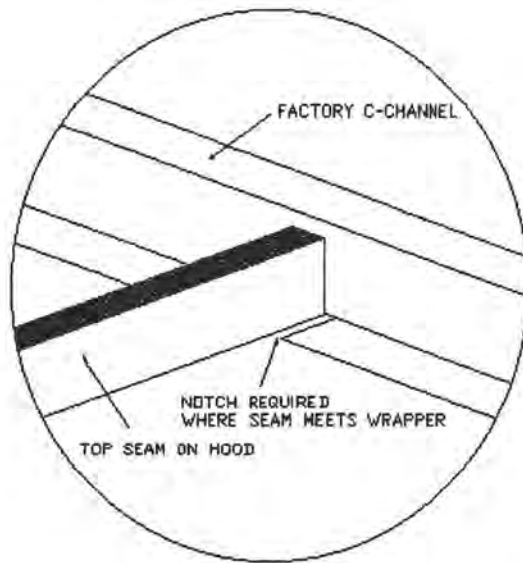


FIG. 3 TOP HOOD SEAM DETAIL

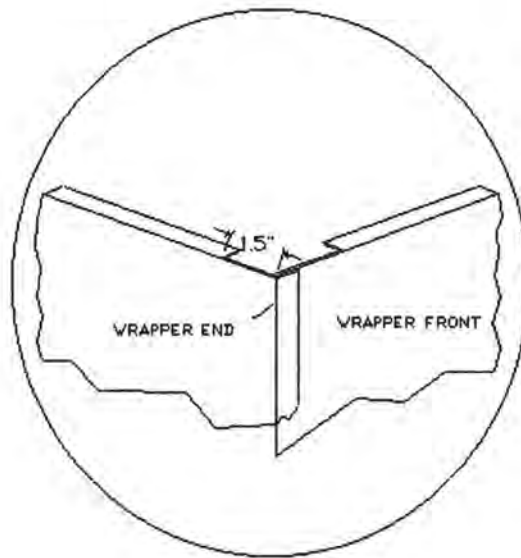


FIG. 4 CORNER DETAIL

PLACE FRONT PANEL
UNDER 90 DEGREE BEND
OF SIDE PANEL AND SCREW OR
POP-RIVET INTO POSITION

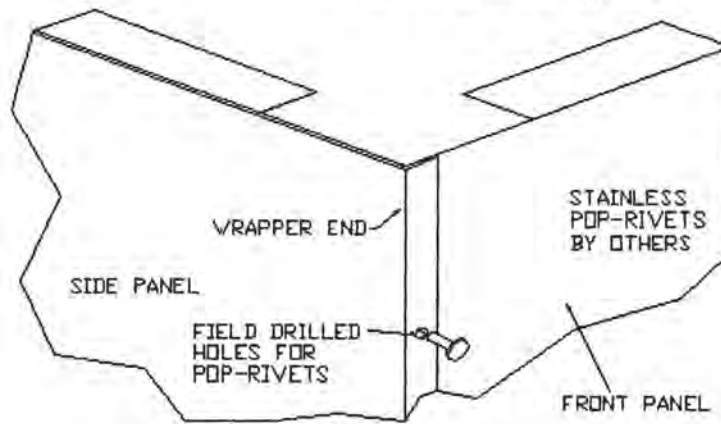


FIG.5 FRONT CORNER ASSEMBLY

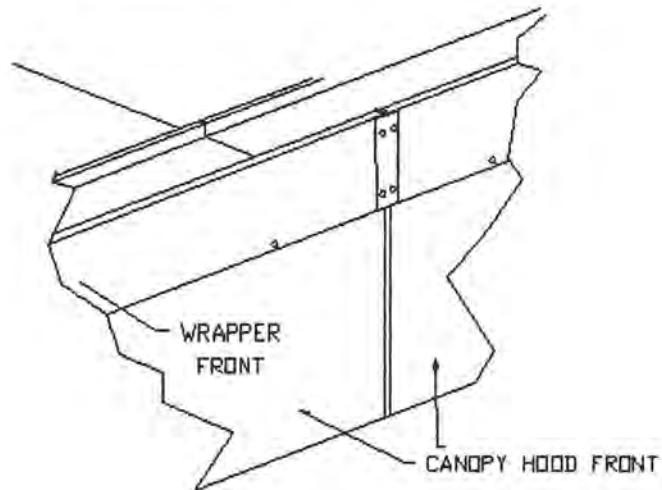


FIG.6 FRONT WRAPPER JOINT ASSEMBLY

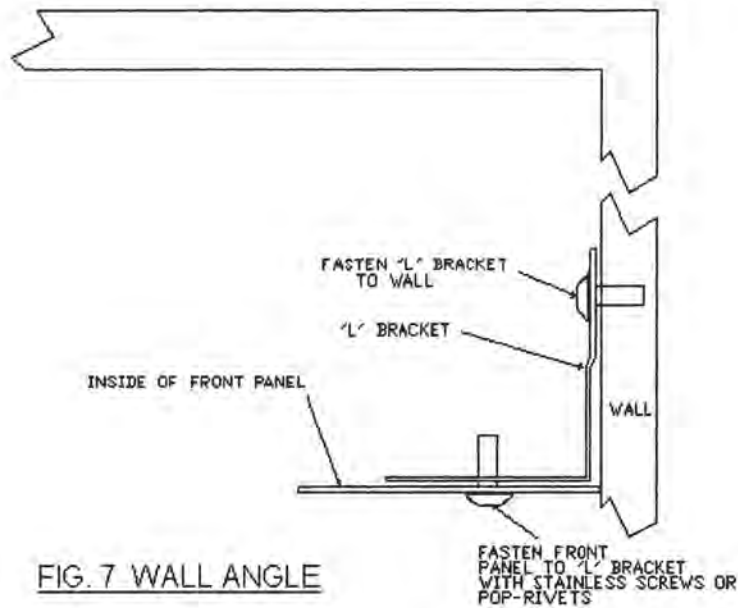


FIG. 7 WALL ANGLE

FOR SINGLE HOODS EXCEEDING 16 FEET

FOR HOODS WITH SIDE WALL AND STANDOFF OPTION:

1. Complete steps 1 through 4 of the standard instructions.
2. Locate standoff panel. Slip its' lower 3/8" flange under factory C-channel. Front face of panel should be even with front of hood. Fasten panel to wall and C-channel.
3. Locate front panel of wrapper assembly. Slip its' lower 3/8" flange under factory C-channel. Slide panel end behind the 90 degree bend of side panel. (Fig. 4) Once in position, make sure wrapper face and hood face are flush. Screw or rivet front panel to C-channel and standoff panel (Fig. 8)
4. Locate a corner gusset and install under top corner of the wrapper where 90 degree bend meets the front panel. (Fig. 5)
5. Caulk all gaps and seams.

FOR 16 FOOT HOODS WITH ATTACHED FIRE CABINET:

1. Complete steps 1 through 7 of standard instructions.
2. Locate fire cabinet wrapper panel. Repeat steps 2,3,4 for this panel. Make sure that 1 inch offset flange of fire cabinet slides behind front panel. A corner gusset will not be necessary for this application. Pop rivet or screw fire cabinet panel to front panel, C-channel, and "L" bracket. (Fig. 9)
3. Caulk all gaps and seams.

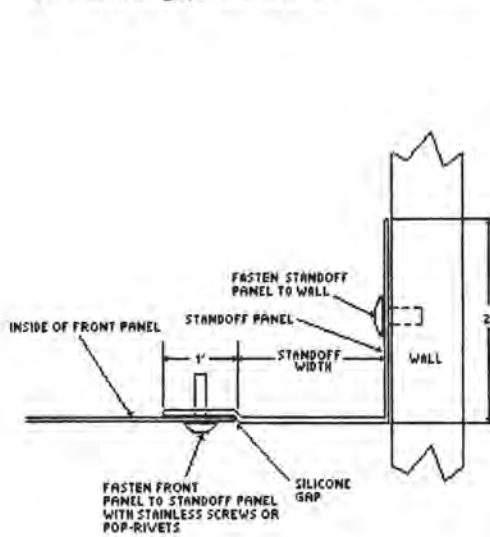


FIG. 8 STANDOFF PANEL

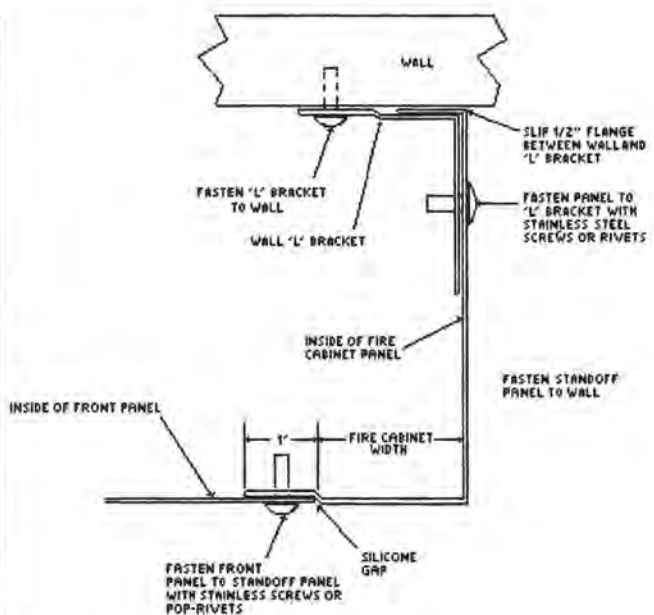


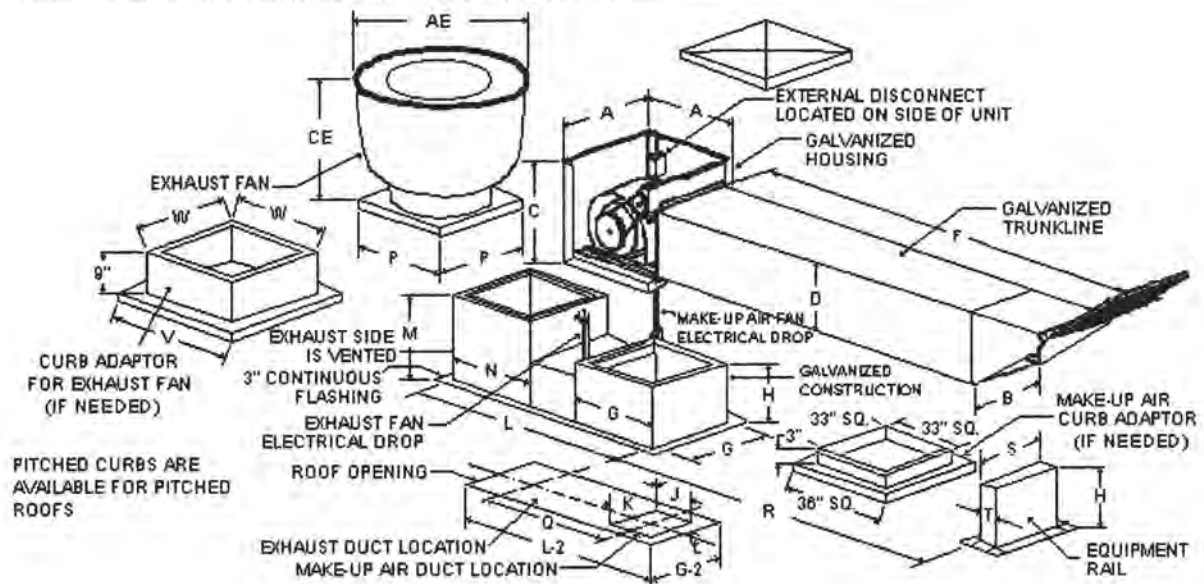
FIG. 9 FIRE CABINET PANEL

Installing the Roof Top Package Unit (Combined Exhaust/Supply Air Unit)

If a combined exhaust/make-up air unit (RTP) is supplied with the job, proceed as follows:

1. Refer to components drawing in the "General Information" section.
2. Determine the location of the hood in the building from the plans and job specs.
3. Draw an outline of the hood on the floor exactly where it will be positioned.
4. Determine and mark the center line of the main exhaust duct where it will penetrate the roof deck. (This point may or may not be the same as the exhaust riser on the hood since a pantleg duct or offset duct may have to be used.)
5. Extend the exact center of the exhaust duct straight up to the roof, using a plumb bob. Punch a hole through the roof deck at this point. This is the exhaust center.
6. Re-check your measurements to be sure the hole will be cut properly.
7. Locate the punched hole on the roof. Draw center lines on the roof the same as the center lines of the main exhaust duct and determine the proper roof opening size from the model specific documentation at the job site.
8. Mark the opening on the roof and be sure that the exhaust center line drawn on the roof lines up with the exhaust center line of the curb. Cut the roof opening.
9. Place the curb over the opening and flash it onto the roof deck.
10. Place the unit onto the curb, being sure that the exhaust fan section is over the exhaust duct center line.
11. Place the equipment rail on the roof at a distance of 57-1/2" from the edge of the curb to the make-up air intake side of the unit.
12. Flash the rail onto the roof deck.
13. Secure the intake air trunkline (with the filter) to the unit with screws. Caulk the joint.
14. Bring power to the unit from the switches through the flex drop. (Refer to "Wiring the System" section.)

The drawing below shows a typical rooftop package installation.



For specific dimensional information, please refer to the model specific documentation at the job site.

Installing the Make-Up Air Unit

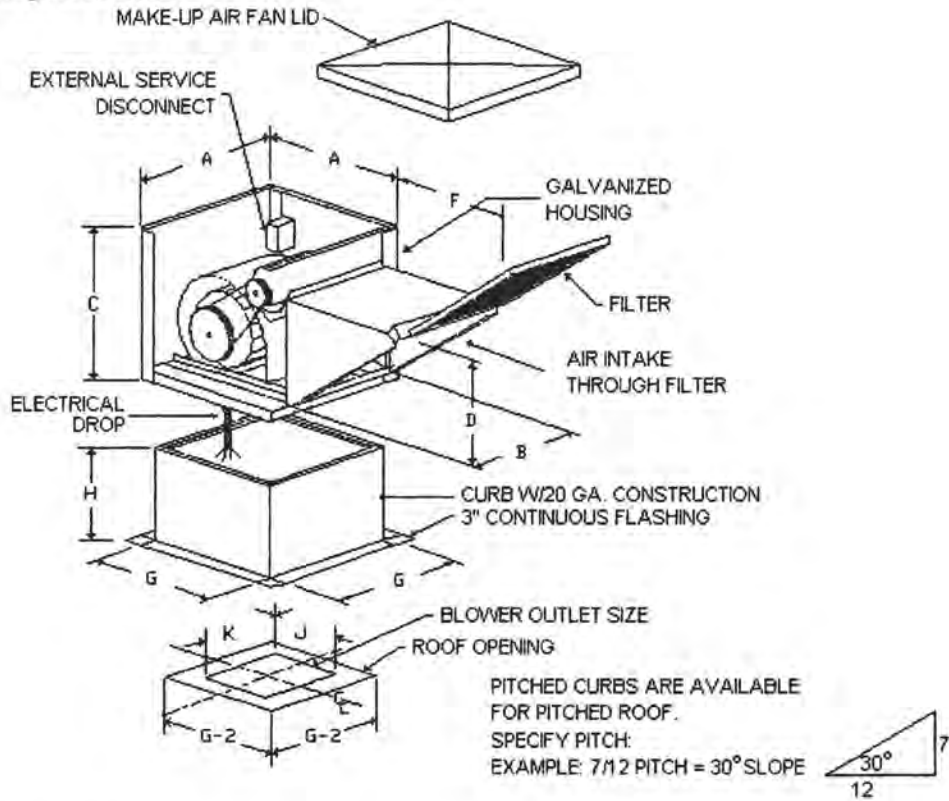
If a Make-Up Air Unit is supplied with the job, proceed as follows:

1. Refer to components drawing in the "General Information" section.
2. Determine the location of the hood in the building from the plans and job specs.
3. Draw an outline of the hood on the floor exactly where it will be positioned.
4. Determine and mark the center line of the main supply duct where it will penetrate the roof deck. (This point may or may not be the same as the supply riser on the hood since code requires the make-up air intake to be positioned at least 10' from the exhaust outlet.)
5. Extend the exact center of the supply duct straight up to the roof, using a plumb bob. Punch a hole through the roof deck at this point. This is the make-up air center.
6. Re-check your measurements to be sure the hole will be cut properly.
7. Locate the punched hole on the roof. Draw center lines on the roof the same as the center lines of the main make-up air duct and determine the proper roof opening size from the model specific documentation at the job site.
8. Mark the opening on the roof and be sure that the make-up air center line drawn on the roof lines up with the make-up air center line of the curb. Cut the roof opening.
9. Place the curb over the opening and flash it onto the roof deck.
10. Place the unit onto the curb and secure with self-tapping screws.
11. Bring power to the unit.

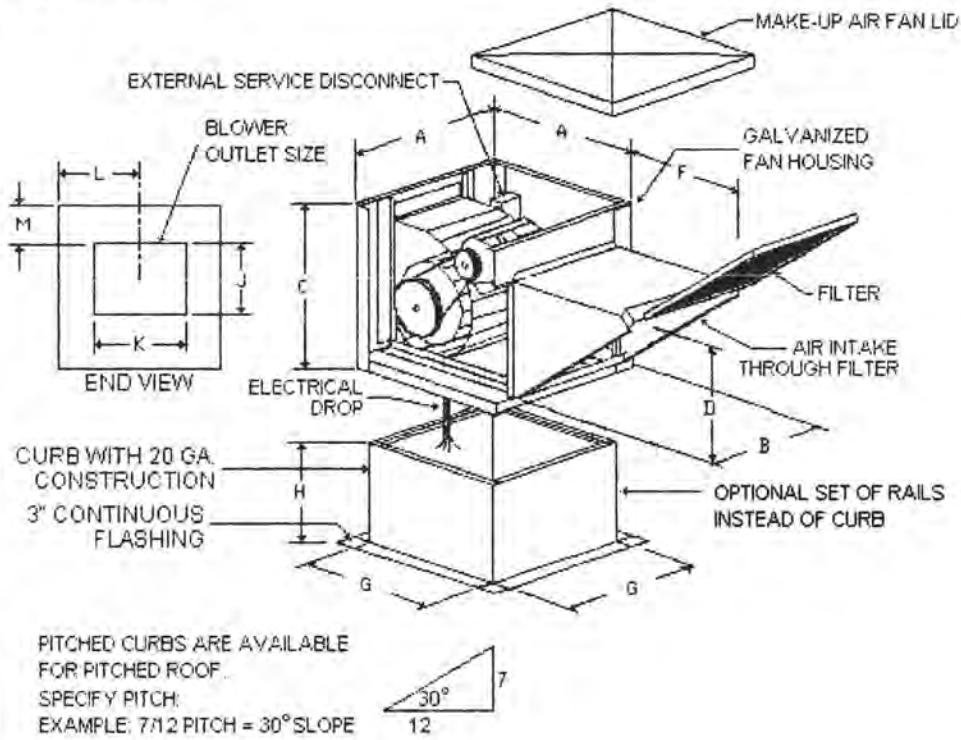
Below are exploded drawings which show typical installations of a make-up air unit.

For specific dimensional information, please refer to the model specific documentation at the job site.

Down Discharge Installation



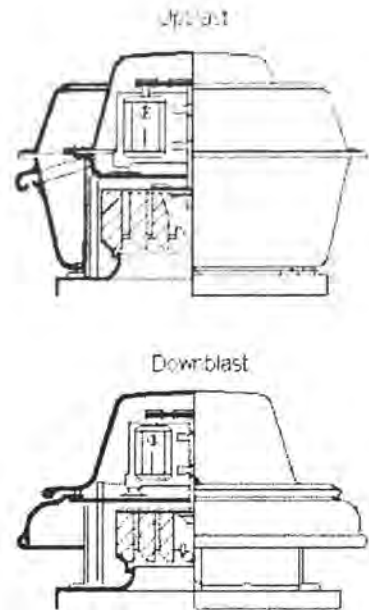
Side Discharge Installation



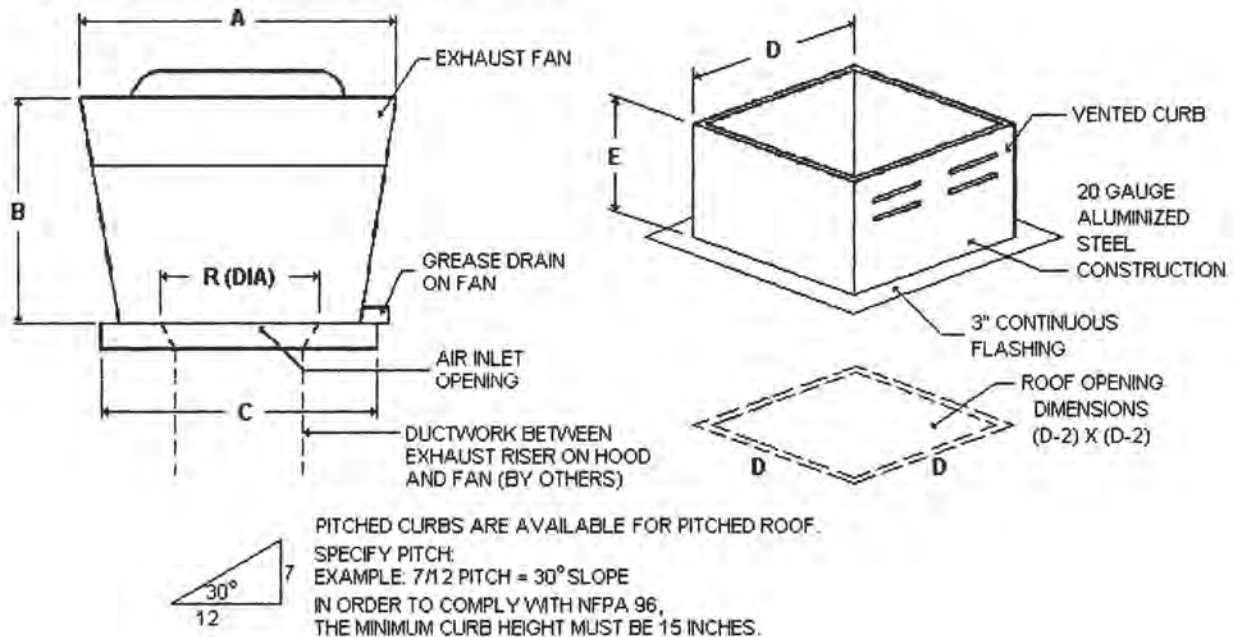
Installing the Exhaust Fan

If an Exhaust Fan is supplied with the job, proceed as follows:

1. Refer to drawing in the "General Information" section.
2. Determine the location of the hood in the building from the plans and job specs.
3. Draw an outline of the hood on the floor exactly where it will be positioned.
4. Determine and mark the center line of the main exhaust duct where it will penetrate the roof deck.
5. Extend the exact center of the exhaust duct straight up to the roof, using a plumb bob. Punch a hole through the roof deck at this point. This is the exhaust center.
6. Re-check your measurements to be sure the hole will be cut properly.
7. Locate the punched hole on the roof. Draw center lines on the roof the same as the center lines of the exhaust duct and determine the proper roof opening size from the model specific documentation at the job site.
8. Mark the opening on the roof and be sure that the exhaust center line drawn on the roof lines up with the center line of the curb. Cut the roof opening.
9. Place the curb over the opening and flash it onto the roof deck.
10. Place the unit onto the curb and secure with self-tapping screws.
11. Bring power to the unit.



The drawing below shows a typical exhaust fan installation.



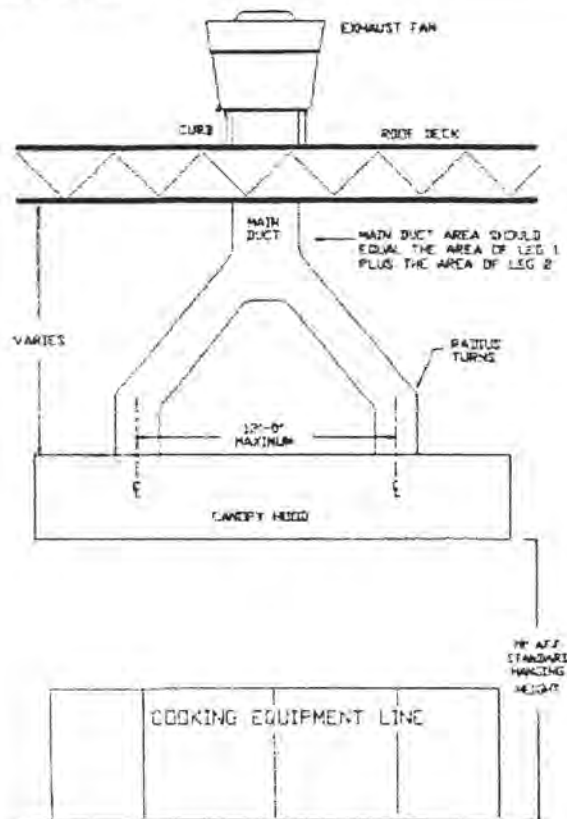
For specific dimensional information, please refer to the model specific documentation at the job site.

Installing Ductwork: Guidelines

The following information serves as a guideline only. Ductwork should be installed in accordance with local codes and restrictions. IT IS THE RESPONSIBILITY OF THE INSTALLER TO CHECK LOCAL CODES BEFORE RUNNING DUCT.

1. All exhaust ductwork must be installed in the most direct manner possible.
2. Exhaust duct must be made of 16 gauge steel or 18 gauge stainless steel.
3. Per NFPA-96-Chapter 3, all exhaust duct seams and joints must have a continuous liquid tight external weld.
4. EXHAUST RISERS on the hood have been sized to achieve the velocity of 1500-2200 FPM (NFPA-96) based on the CFM required for the hood. Please be sure to maintain the area of each riser when connecting duct, offsets or transitions to it.
5. Branches should enter at gradual expansions and at an angle of 30 degrees or less (preferred) to 45 degrees if necessary. Avoid "T" intersections.
6. When a "PANTLEG DUCT" is required to bring two ducts into one exhaust fan, please observe the following:
 - a. Use ONLY radius back and radius throat elbows. (2 to 2.5 diameter center line radius is recommended)
 - b. Maintain the distance between the center line of exhaust ducts at a maximum of 12' apart.
 - c. The main duct going to the exhaust fan must be the sum of the area of the separate legs.
7. MAKE-UP AIR RISERS are sized around 800-1200 FPM. Maintain this area when installing ducts.
8. DO NOT use "flexible" type duct for make-up air duct, as it has higher pressure losses caused by the friction of the irregular inside duct surface. Only the rigid type duct installed in accordance with SMACNA/HVAC Duct Construction Standards will be acceptable.
9. IMPORTANT: When a fusible link is installed in the make-up air damper at the hood collar, an access door must be cut into the make-up air duct by the installer.

Installing the Pantleg Ductwork



Clearances

The normal requirement states that a hood and associated ductwork must have an 18" clearance from combustible materials. Since this is too great in most installations, BOCA, NFPA and the Uniform Mechanical Code have produced approved methods of protecting exhaust ducts from surrounding combustibles to reduce this clearance to 3". Please observe the method approved by local authorities governing your area.

BOCA

SECTION M-1101.0 - REDUCED CLEARANCES

M-1101.1 Labeled reduction: The required clearance to combustibles may be reduced by methods that have been tested and bear the label of an approved agency.

M-1101.2 Reduction table: The required clearance to combustibles may be reduced when protected in accordance with one of the methods specified in Table M-1101.2. The reduced clearance distances in the table shall be measured from the device to the face of the protection.

Table M-1 101.2 - REDUCED CLEARANCE TO COMBUSTIBLES

Reduced clearance protection*	Reduced clearance based on required clearance to combustibles (inches)**			
	36	18	9	6
1/8-inch unpainted aluminum plate spaced 1 inch off the wall	3	3	3	3
1/8-inch painted aluminum plate spaced 1 inch off the wall	28	9	3	3
Unpainted galvanized sheet metal Manufacturer's Standard Gage No. 28 mounted on 1/2-inch inorganic insulating board attached directly to the wall	3	3	3	3
Painted galvanized sheet metal Manufacturer's Standard Gage No.28 spaced 1 inch off the wall	24	6	3	3
2 layers of painted galvanized sheet metal Manufacturer's Standard Gage No. 28 having a 1-inch air space between layer, spaced 1 inch off the wall	3	3	3	3
1/4-inch inorganic insulating board having painted galvanized sheet metal Manufacturer's Standard Gage No. 28 attached on both sides spaced 1 inch off the wall	3	3	3	3
1/4-inch inorganic insulating board spaced 1 inch off the wall	30	9	3	3
2 layers of painted galvanized sheet metal Manufacturer's Standard Gage No. 24 having 1 inch of fiberglass insulation between layers spaced 1 inch off the wall	3	3	3	3
3-1/2-inch thick wall space 1 inch off the wall	18	5	3	0

Note: * The spacers shall be noncombustible

Note: ** 1 inch - 25.4mm

Uniform Mechanical Code
TABLE NO. 5-B - CLEARANCES, INCHES, WITH SPECIFIED FORMS OF PROTECTION,****

TYPE OF PROTECTION Applied to the Combustible Material Unless Otherwise Specified and Covering All Surfaces Within the Distance Specified as the Required Clearance With No Protection (Thicknesses Are Minimum)	WHERE THE STANDARD CLEARANCE IN TABLE NO. 5-A WITH NO PROTECTION IS:											
	36 inches			18 inches			9 inches			6 inches		
	Above	Sides & Rear	Chimney or Vent Connector	Above	Sides & Rear	Chimney or Vent Connector	Above	Sides & Rear	Chimney or Vent Connector	Above	Sides & Rear	Chimney or Vent Connector
a) 1/4" insulating millboard spaced out 1"****	30	18	30	15	9	12	9	6	6	3	2	3
b) 0.013" (No. 28 manufacturer's standard gage) steel sheet on 1/4" insulating millboard	24	18	24	23	9	12	9	6	4	3	2	2
c) 0.013" (No. 28 manufacturer's standard gage) steel sheet spaced out 1"****	18	12	18	9	6	9	6	4	4	2	2	2
d) 0.013" (No. 28 manufacturer's standard gage) steel sheet on 1/8" insulating millboard spaced out 1"****	18	12	18	9	6	9	6	4	4	2	2	2
e) 1/2" insulating cement covering on heating appliance	18	12	36	9	6	18	6	4	9	2	1	6
f) 1/4" insulating millboard on 1" mineral fiber bats reinforced with wire mesh or equivalent	18	12	18	6	6	6	4	4	4	2	2	2
g) 0.027 (No. 22 manufacturer's standard gage) steel sheet on 1" mineral fiber bats reinforced with wire or equivalent	18	12	12	4	3	3	2	2	2	2	2	2

*For appliances complying with Section 504(b) and (c)

**Except for the protection described in (3), all clearances shall be measured from the outer surface of the appliance to the combustible material, disregarding any intervening protection applied to the combustible material

***Spaces shall be on noncombustible material

NOTE: Insulating millboard is a factory made product formed of noncombustible materials, normally fibers, and having a thermal conductivity of 1 Btu-inch per square foot per degree F, or less

NFPA 96

Appendix A: *This Appendix is not a part of the requirements of this NFPA document, but it is included for information purposes only.*

A-1 Where 18 in. (457.2 mm) clearance is required to unprotected combustible material, the clearance may be reduced if the combustible material is protected by an engineered construction system acceptable to the authority having jurisdiction, or by the use of materials or products listed for protection purposes, or by the use of materials listed below:

Type of Protection

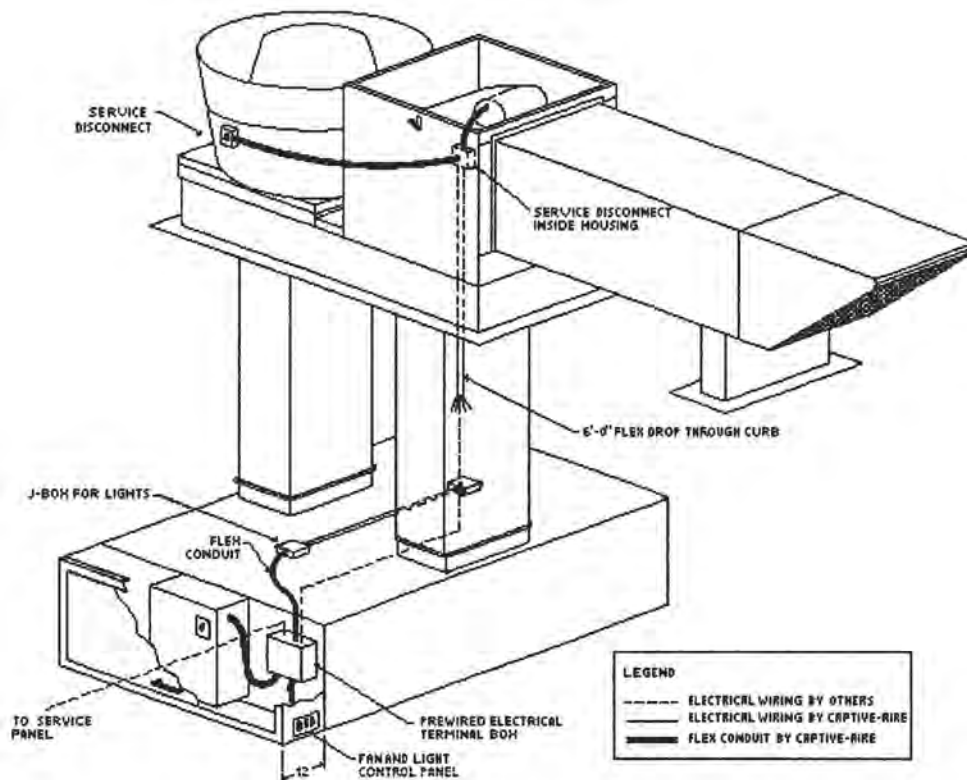
1. 0.013-in. (.33mm) (28 gage) sheet metal spaced out 1 in. (25.4 mm) on noncombustible spacers. **Clearance:** 9 inches (228.6 mm)
2. 0.027 (.69 mm) (22 gage) sheet metal on 1 in. (25.4 mm) mineral wool bats reinforced with wire mesh or equivalent spaced out 1 in. (25.4 mm) on noncombustible spacers **Clearance:** 3 inches (76.2 mm)

A-2 Materials and products listed for the purpose of reducing clearance to combustibles shall be installed in accordance with the condition of the listing and the manufacturer's instruction.

Wiring the System

Field Completion of Wiring:

1. If a CONTROL PANEL is furnished:
Follow the field wiring instructions included with the package.
2. If a CONTROL PANEL is not furnished:
Complete the wiring in accordance with the project specifications and the national and local electrical codes.
3. If power and/or control wiring is furnished with the ROOF TOP UNIT:
Extend to the junction box on top of the hood and connect to like numbers or power supply as indicated in the field wiring instructions.
4. When sizing main breakers: Refer to the nominal full load amps listed on the motor plates.



GUIDELINES BEFORE YOU BEGIN:

1. A hood with multiple make-up air risers should be balanced according to the cooking load beneath it. For example, if a hood with multiple make-up air risers has a charbroiler on the left end and several ovens on the right end, the hood should be balanced at a 50% to 60% internal make-up air ratio on the left and a 65% to 70% internal make-up air ratio on the right. This will achieve the most efficient contaminant capture with maximum make-up air.
2. Grilles discharging air from the face of the hood may sometimes interfere with contaminant capture. If smoke seems to be drawn out of the hood due to air flow out of these grilles, check the following:
 - a. Air velocities out the grilles: Velocities should be close to specified values.
 - b. Direction of the grilles: Experimentally change the direction of the grilles to redirect the air.
 - c. Amount of make-up air flow: Lower the amount flowing through the grilles.
3. When fan pulleys are adjusted, belts should then be re-checked for correct tension and an amperage reading should be taken on the motor to make certain it is not overloaded.
4. The prime objective of balancing is to insure that each hood will capture all the contaminants produced by the equipment it covers without causing undesirable conditions in the kitchen (i.e., excessive negative pressure, excessive quantities of hot or cold air in the kitchen, etc.). Normally, an internal make-up air ratio of 70% is the best that is obtainable. For hoods covering charbroilers and other heavy equipment, a 50% to 60% make-up air ratio is the best that is obtainable. If a hood is specified for 350 CFM per foot and will not capture at 60% make-up air then it is normally better to lower the exhaust CFM and reset the make-up air for the same net air loss rather than to try to increase the exhaust only. In other words, the hoods are more effective at low exhaust/low supply ratios than at high exhaust/high supply ratios even though the net air loss would be the same in both cases.
5. A performance evaluation of the system can be performed only if all the following items have been completed:
 - a. All fans operational and rotations visually verified by observation of the arrows stamped on them.
 - b. All filters in place.
 - c. Equipment under the hood in place and operational.
 - d. HVAC units in place and operational.
6. If problems occur, refer to the Troubleshooting Section of this manual.

EXTERNAL FACTORS WHICH MAY AFFECT YOUR HOOD PERFORMANCE:

1. HVAC units are generally specified to supply 25% outside air (OA) to the room ventilation. If RTU's are not supplying the proper amount of OA to the building, negative pressure will exist. Negative pressure can compete with the hood's capture ability and can create drafts in the building that affect the hood's performance.
2. HVAC return grilles located close to a hood can cause performance problems. The return grille competes with the hood to capture the air in the room. For example, a return grille for a 10-ton HVAC unit can draw anywhere from 3000 to 4000 CFM. This is equivalent to the exhaust of a 10' to 13' canopy hood. As a result, a return air grille located within 6' of a hood can have a serious effect on that hood's capture ability.
3. HVAC diffusers located near a hood can create flows in the room that detract from the hood's ability to capture. If the HVAC diffuser bounces air off the front of the hood or directs air along the hood and past the end, the air flow created can draw smoke and contaminants out of the hood.

CALCULATING MAKE-UP AIR CFM

1. Compute the open area of the supply plenum of the hood. This area must be calculated at the same plane that velocity readings are taken. Area can be calculated using the following formula:

$$\text{Area (ft}^2\text{)} = \text{Length (ft)} \times \text{Width (ft)}$$

If both the length and width are measured in inches, use the following formula:

$$\text{Area (ft}^2\text{)} = \text{Length (in)} \times \text{Width (in)} / 144$$

2. Record velocity of air through supply openings from left to right on raw data sheet.
8 readings per grille
1 reading per foot of slot
3. Compute and record average velocity through supply openings.
4. Compute and record CFM through supply openings. CFM = Free area x average velocity.
5. Compute total CFM through all supply openings for each hood.

CALCULATING EXHAUST AIR CFM

1. Record filter sizes of each hood on raw data sheet.
2. Compute free area of filters.
Example:
 $16 \times 16 = 14 \times 14 = 1.36 \text{ ft}^2$
 $10 \times 20 = 8 \times 18 = 1.00 \text{ ft}^2$
 $12 \times 16 = 10 \times 14 = 0.97 \text{ ft}^2$
3. Record velocity of exhaust gases through filters starting top left to right (5 reading/filter).
4. Find average velocity through each filter.
5. Compute CFM through each filter. $\text{CFM} = \text{Free area} \times \text{average velocity}$.
6. Total exhaust CFM for each hood.
7. Multiply total exhaust CFM x 0.78. (This is the K Factor necessary when using the EDRA velometer.)

CONCLUSION:

1. Compare specified data to the data recorded. Adjust exhaust as necessary using adjustable pulley on fan. Adjust supply as necessary using dampers on supply risers and adjustable pulley on supply fan.
2. After setting hoods to specified data, the room parameters should be checked.
3. If room parameters are not acceptable yet, the hood can be modified to improve them without decreasing hood performance. This is an acceptable condition.
4. Use a smoke bomb to verify that the hood captures adequately. This can be your final verification.

Complete Equipment List for Performance Evaluations

- Closed End Wrenches (9/16, 1/2, 7/16, 3/8, 5/16, 1/4)
- Socket Set & Ratchet (9/16, 1/2, 7/16, 3/8, 5/16, 1/4)
- Extension for Ratchet
- Cheater Bar
- Screwdrivers (Phillips & Standard, Short & Long)
- Adjustable Wrenches (Large & Small)
- 5/32" 9" Long Allen Wrench
- Multi-key Hex Set (Standard Assortment)
- Tape Measure, Hammers (Hard & Soft)
- 2-Channel Locks
- Vise-Grip Pliers (Medium Size)
- Velometer (or similar unit) (Edra 5LV or Davis LCA6000 recommended)
- Manometer (or similar unit) (Dwyer Magnehelic Model #2000-00 recommended)
- Work Gloves
- 6' Step Ladder
- 20' Extension Ladder
- Tachometer (Mechanical)
- Amprobe (Volt & Amp Meter)

Optional Equipment

- Wire Cutters
- Wire Strippers
- Wire Crimper
- Needle-Nose Pliers (Curved & Straight)
- Hacksaw & Blades
- Drill & Bits (1/8, 5/32, 3/16, 3/8, etc.)
- Rivet Gun & Rivets (1/8, 5/32, 3/16, Long & Short)
- Pulley Puller
- Metal Shears
- Duct Tape
- Caulk Gun & Silicone (Hi-Temp)
- Wire Connections
- Wire Nuts (Assorted)
- Wire (Red, White, Blue, Black, Green)
- Flex Conduit (Standard & Liquidtight)
- Romex Connector
- 90' Liquid - Tite Conduit Connectors
- Nuts & Bolts (For Motors, Switchboxes, Sheetmetal)
- Insulation
- 3-Wire SJ Cord
- 4-Wire SJ Cord
- Starter
- Spare Motor & Belt
 - Example: 115/230, 1 Phase (1/2, 1, 1 1/2 hp)
 - 220/440, 3 Phase (1/2, 1, 1 1/2, 2 hp)
 - 4L230-4L320 (Every 10)
 - 4L320-4L720 (Every 20)
- Knockouts (1/2", 3/4", 1")
- Unishear
- Grinder & Redwheel
- Sheila-Shine

Maintenance Guide

ROOF TOP PACKAGE SYSTEM, MAKE-UP AIR AND EXHAUST FANS

1. Air intake filters should be cleaned monthly or more often if conditions dictate.
2. Check all belts for slippage and tighten if necessary.
3. Perform cleaning on the exhaust fan interior and wheel as required to prevent accumulation of grease that could lead to a fire hazard.
4. At least every six months, all electrical connections should be inspected and checked for tightness.
5. Oil and/or grease all motors and bearings every six months or as conditions dictate.
6. If supplied with job, check and empty grease collection cup on outside of exhaust fan.

CLEANING AND MAINTENANCE OF STAINLESS STEEL HOODS

1. Carefully wipe away gritty substances clinging to stainless steel surfaces to avoid scratching.
2. Dilute 1/2 cup of laundry detergent (E.G. Tide, Surf) with 1 gallon warm water.
3. Soak a cloth in the water detergent solution. Wring out excess.
4. Rub the cloth in the direction of the grain.
5. Wipe stainless steel with cloth soaked in warm water to remove all traces of the cleansing agent.
6. Wipe stainless steel dry with a clean cloth.
7. Reapply stainless steel polish (E.G. Sheilla Shine).
8. Empty and clean grease drain and cups.
9. Filters should be cleaned in a dishwasher or soak sink periodically.

CAUTION

DO NOT use iron wool (Brillo Pads), scrappers, or spatulas to clean hood!

DO NOT use the following substances on or around the hood!

1. Chlorine or chlorine based substances.
2. Acids (E.G. acetic, hydrochloric, sulfuric).
3. Chloride based substances (E.G. mercuric chloride, ferric chloride).

Vapors of the above substances can corrode stainless steel!

Operation of Hood

- Before turning on cooking equipment, make sure that the make-up air and exhaust fans are on. Leave fans on at least 30 minutes after cooking equipment is shut off. Clean hood daily with non-abrasive cleaners. Remove filters and run through dishwasher daily.
- **Semi-Annually:** Fire system must be inspected by local, qualified fire system distributor.

Troubleshooting

NO MAKE-UP AIR

1. Are the make-up air dampers open?
 - a. Will the damper blade move freely?
 - b. Does the ductwork block the blade?
2. Is the make-up air fan running?
 - a. 208/3 phase fans have reset switches on their starters.
 - b. Check the circuit breaker panel.
 - c. Check the disconnect switch on the fan.
 - d. Check belt on fan.
3. Check the ductwork for:
 - a. Flex duct in make-up air ductwork.
 - b. Excessive number of elbows.
 - c. Leaks.
4. Check make-up air fan unit filters for cleanliness.
5. Is the fan running in the right direction?
 - a. Check the rotation arrow on the fan.
 - b. 3 phase motors reverse direction by interchanging any 2 leads.
 - c. 1 phase motors have wiring instructions printed on the motor.
6. Fire system - If the fire system has not been armed, the microswitch may be keeping the make-up air fan "off". A Fire System Distributor must arm the unit before the fan will work.

NO EXHAUST

1. Is the exhaust fan running?
 - a. 208/3 phase fans have reset switches on their starters.
 - b. Check the circuit breaker panel.
 - c. Check the disconnect switch on the fan.
 - d. Check belt on fan.
2. Is the fan running backwards?
 - a. Check the rotation arrow stamped on the fan.
 - b. 3 phase motors reverse direction by interchanging 2 leads.
 - c. 1 phase motors have wiring instructions printed on the motor.
3. Is the correct fan over the correct hood?
4. Check the ductwork for:
 - a. Squared elbows.
 - b. Excessive number of elbows.
 - c. Leaks.
5. Are the filters damaged?
 - a. Dirty.
 - b. Bent.
 - c. Missing.

MOTOR CYCLES ON AND OFF

1. Check amperage, make sure it is below the FLA rating.
2. Flue gas equipment under backshelf hoods with short exhaust ducts can cause exhaust fans to cycle due to automatic thermally protected motors. Change to manual reset switch motor with class B insulation.
3. If fan is near a heat source on the roof, i.e., refrigerator compressor, motor may cycle.
4. Motor may be wired for 115V/1 phase instead of 208V/1 phase and vice versa. This will also cause the fan to cycle.
5. Circuit breaker may be undersized and tripping out.

Limited Warranty

**Exclusive One-Year
Kitchen Ventilation System Limited Warranty**

Warranty

The kitchen ventilation equipment is warranted for a period of one year from the date of shipment against defects in workmanship and materials, provided all equipment has been installed in accordance with the installation instructions provided with each ventilation package.

The Supplier will repair or replace any part which, in its opinion, is defective and has not been tampered with or subjected to misuse, abuse, or exposed to highly corrosive conditions.

Conditions

The owner is required to provide regular maintenance service on the fire control system at 6-month intervals conducted by a qualified distributor, expense of which to be paid by owner.

THE SUPPLIER MUST BE NOTIFIED OF THE ALLEGED EQUIPMENT DEFECT WITHIN 48 HOURS AFTER IT HAS BEEN DISCOVERED. ANY WORK DONE WITHOUT PRIOR AUTHORIZATION FROM SUPPLIER WILL NOT BE PAID FOR.

Exclusions

The Supplier is not responsible for normal maintenance such as changing of belts, replacement of filters, cleaning and oiling, lubrication of the system and moving parts.

The Supplier does not guarantee the fire control system will extinguish a fire. The fire control system is a premanufactured product that must be installed in accordance with the manufacturer's specifications. This warranty is made for the sole use and benefit of the owner and is not assignable or transferable in any manner whatsoever, except by written consent of Supplier.

The Supplier is not responsible for consequential damages to injured persons or damaged property caused by fire or the inability of the fire control system to discharge.

DISCLAIMER OF LIABILITY AND LIMITATION OF DAMAGES

The above warranty is the only one given by the Supplier concerning this system and applies only to its systems that have been installed and maintained in accordance with all the directions and requirements provided by it. WE SPECIFICALLY DISCLAIM ANY OTHER WARRANTIES, EXPRESS OR IMPLIED INCLUDING WARRANTIES OF FITNESS FOR PURPOSE AND MERCHANTABILITY. THE SUPPLIER SHALL NOT, UNDER ANY CIRCUMSTANCES, BE LIABLE FOR COLLATERAL, CONSEQUENTIAL, OR SPECIAL DAMAGES TO PROPERTY. The Supplier does not assume or authorize any other person to assume any additional liability in connection with the sale of its systems.

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 7 QUANTITY- 001

DESCRIPTION- FIRE SUPPRESSION SYSTEM

MANUFACTURER- CAPTIVE-AIRE SYSTEMS,

MODEL NUMBER- ANSUL R-102

SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS
STEAM PRESSURE-	TYPE OF GAS-		

ACCESSORIES, ATTACHMENTS, OR REMARKS

CAPTIVE-AIRE TO PROVIDE ANSUL R-102 FIRE SUPPRESSION SYSTEM. PRE-ENGINEERED FIRE SUPPRESSION SYS. INCLUDING LIQUID AGENT SURFACE, DUCT, PLENUM PROTECTION, INTER-CONNECTING PIPING, CABLE RUNS BETWEEN NOZZLES, FUSIBLE LINKS, MANUAL RELEASE, STAINLESS STEEL LIQUID AGENT TANK WITH NON-MAGNETIC TYPE STAINLESS STEEL CABINET. INSTALLATION OF REMOTE MANUAL RELEASE STATION AS DIRECTED BY LOCAL AUTHORITIES AND/OR AS INDICATED ON PLANS TANKS INSTALLED IN END OF ITEM #6, EXHAUST HOOD. ALL PIPING RUNNING ABOVE TOP OF EXHAUST HOOD WITH VERTICAL DROPS ONLY AT POINT OF SURFACE PROTECTION. ALL PIPING AND FITTINGS WHERE EXPOSED WHETHER WITHIN HOOD OR NOT AND ABOVE COOKING EQUIPMENT SHALL BE STAINLESS STEEL JACKETED. HORIZONTAL PIPING WITHIN CAPTURE AREA WILL NOT BE ACCEPTABLE UNLESS A DOUBLE NINETY PIPING ARRANGEMENT IS REQUIRED AT BOTTOM OF APPLIANCE DROP ANY HORIZONTAL PIPING INSTALLED INCORRECTLY OR NOT IN ACCORD WITH SPECIFICATIONS WILL BE REMOVED AND ALL UNNECESSARY HOLES CREATED BY THE HORIZONTAL PIPING WILL BE PLUG WELDED AND POLISHED TO ORIGINAL FINISH. CHROME PLATED GREASE FITTINGS WILL ONLY BE INSTALLED AT THE

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 2

ITEM NUMBER- 7 QUANTITY- 001

DESCRIPTION- FIRE SUPPRESSION SYSTEM

MANUFACTURER- CAPTIVE-AIRE SYSTEMS,

MODEL NUMBER- ANSUL R-102

SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

VERTICAL DROPS AND NOT AT AN OPENING
CREATED BY THE HORIZONTAL PIPING. ALL
PIPING LEADING FROM THE SYSTEM TO REMOTE
STATION(S) SHALL BE CONCEALED. ANY
PIPING THAT MAY BE EXPOSED WILL BE
STAINLESS STEEL JACKETED INCLUDING THE
OCTAGON BOX CONTAINING THE PULL
MECHANISM. SNAP ACTION OR MICRO-SWITCH
WITH FORM C DRY CONTACTS AND TWO (2)
DOUBLE POLE, DOUBLE THROW SWITCHES AT
SUPPRESSION CABINET FOR POWER SHUTOFF OF
ELECTRICALLY HEATED COOKING EQUIPMENT.
THE DRY CONTACTS ARE TO BE PROVIDED TO
ALLOW SYSTEM TO BE WIRED INTO BUILDING
ALARM SYSTEM. POWER SHUT-DOWN DEVICES
AND INTERWIRING OF SAME BY ELECTRICAL
CONTRACTOR. SYSTEM AND PRE-PIPING
COMPLYING WITH ALL APPLICABLE SECTIONS
OF NFPA #17A AND #96 AND U.L. -300 TEST-
ING PROGRAM AND INSTALLATION IN FULL
COMPLIANCE WITH THE REQUIREMENTS OF THE
LOCAL AUTHORITY HAVING JURISDICTION.
FIRE SUPPRESSION SYSTEM AND/OR EXHAUST
HOOD PROVIDED WITH BOTH AUDIO ALARM AND
STROBE ALERT, INSTALLED BY FOOD SERVICE
EQUIPMENT SUPPLIER. SYSTEM TO MEET
FACTORY MUTUAL AND NSF STANDARDS. ALL
JOBSITE WORK PERFORMED BY OR UNDER THE
SUPERVISION OF A QUALIFIED FACTORY
AUTHORIZED DEALER. INSTALLATION TO

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 3

ITEM NUMBER- 7 QUANTITY- 001

DESCRIPTION- FIRE SUPPRESSION SYSTEM

MANUFACTURER- CAPTIVE-AIRE SYSTEMS.

MODEL NUMBER- ANSUL R-102

SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

INCLUDE TESTING, PERMITS, CERTIFICATION
FORM AND PROVIDED APPLICABLE PORTIONS
TO AUTHORITIES HAVING JURISDICTION
INCLUDING BUT NOT LIMITED TO OWNER,
INSURANCE SERVICES OFFICES, AND FIRE
MARSHALL.

The National Fire Protection Association (NFPA) recommends that employees be instructed in personal safety and the operation of the system. Ansul provides this owner's guide with each Restaurant Fire Suppression System.

This owner's guide has been provided to help you understand....

-how your restaurant system works
-your responsibilities for maintenance
-what to do in case of fire

This owner's guide is not intended to cover all requirements detailed in the Installation, Operation, Recharge, Inspection, and Maintenance Manual, Part No. 418087. This guide is solely for the use of the end-user to become more knowledgeable with the fire suppression system and the steps necessary in the event of a fire.

Should the end-user want to find out more information concerning the Ansul Restaurant Fire Suppression System, your authorized Ansul distributor can furnish a detailed Installation, Operation, Recharge, Inspection, and Maintenance Manual.

YOUR ROLE IN FIRE PROTECTION

Your Ansul Fire Suppression System is of the highest quality. It has been carefully engineered to be reliable, manufactured to exacting standards, proven by over 30 years of service, and custom designed to protect your particular hazard.

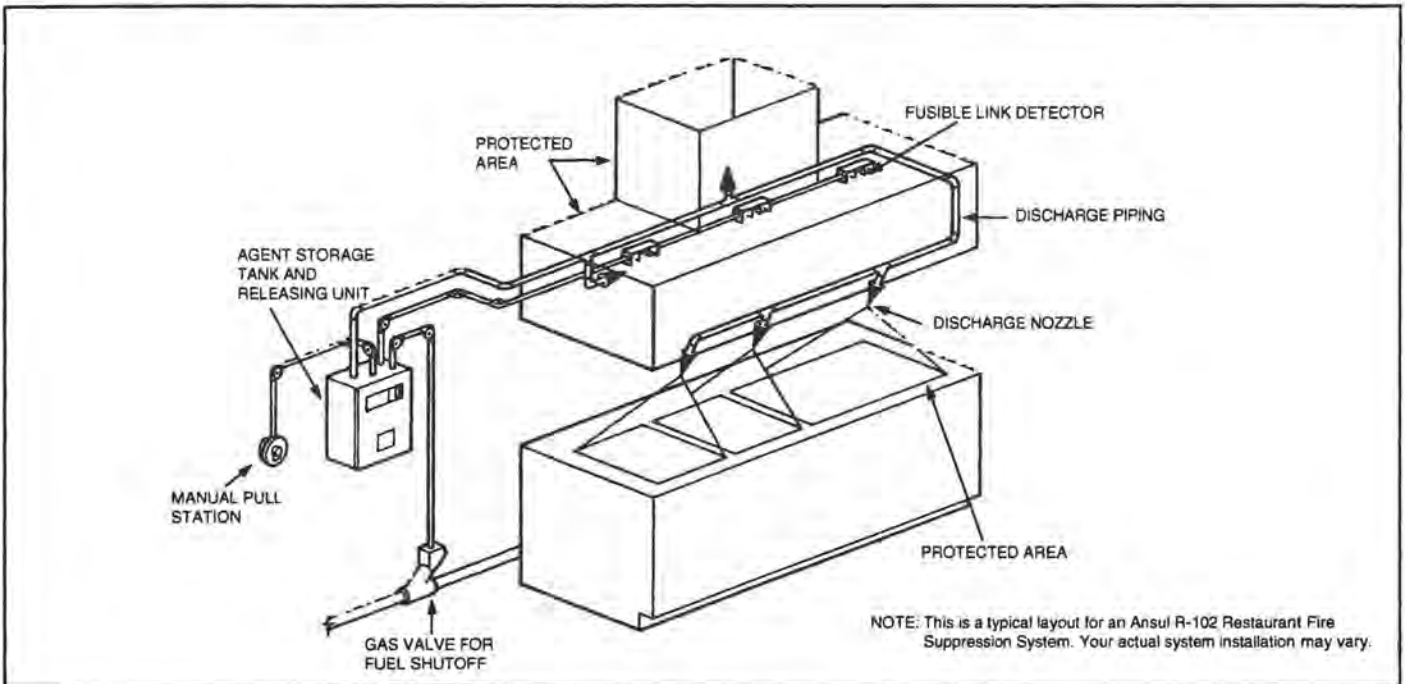
If properly maintained, your system should provide years of protection. However, the primary objective of this guide is to provide enough basic information to help you to prevent a disastrous fire. By observing some fundamental rules, you can greatly reduce the risk of serious fire damage.

1. Keep all kitchen equipment free of grease build-up.
2. Never use flammable solvents or cleaners. Flammable residues could be left in the hazard area.
3. Operate your exhaust system whenever the appliance is pre-heating, heating, cooking or cooling. This helps to prevent excessive heat build-up which could actuate the system.
4. Never operate filter-equipped exhaust systems without the filters in place. Excessive grease may build-up in the hood and duct system. Use only U.L. listed filters.
5. Never restrict air intake passages; this can reduce the efficiency of your exhaust system.
6. Operate all UL tested grease extractors by the manufacturer's instructions to ensure effective grease removal from the hood and duct system.
7. Never tamper with the system components (i.e., detectors, nozzles, agent storage container(s) or releasing unit(s)).

8. Before you revise your kitchen equipment layout or make changes which affect the basic configuration of the protected area, contact your trained, authorized Ansul distributor for a system update evaluation. The system is made up of components tested within limitations contained in the detailed installation manual. The system designer must be consulted whenever changes are planned for the system or area of protection.
9. Do not allow anyone except an authorized Ansul distributor to perform maintenance on your Ansul system. Maintenance to your system must be performed semi-annually. It is essential that the system be maintained properly.
10. Post operating instructions in an obvious place in the kitchen and make sure your employees know what to do in case of fire.
11. Make certain that hand portable extinguishers are properly placed and compatible with the restaurant system. An authorized Ansul distributor can assist your needs.

OWNER'S GUIDE

RESTAURANT FIRE SUPPRESSION SYSTEM



003441

HOW THE ANSUL R-102 SYSTEM OPERATES

1. A fire starts in the protected area....
2. Heat sensitive fusible link detectors activate the system.
3. Appliance energy sources are automatically shut off by accessory equipment appropriate for the type of fuel used by your cooking equipment.
4. The fire extinguishing agent is discharged into the plenum and duct and onto the cooking appliances.
5. The agent and the hot grease mix to form a foam. This temporarily seals combustible vapors, helping to inhibit re-ignition. This seal must not be disturbed.

INSPECTING YOUR R-102 SYSTEM

Your Ansul R-102 system should be inspected at least monthly. **Should you discover any irregularities, contact an authorized Ansul distributor immediately.**

1. Never use corrosive cleaning solutions on the fusible links or cables. Check to make certain there is no corrosion to any of the detection system components. Certain high alkaline cleaners could cause corrosion.
2. Ensure that metal fusible links are replaced at least annually. Deterioration of these links could cause the system to be actuated or to malfunction in case of a fire.
3. Make certain the releasing unit has not been tampered with, and that visual inspection seals are not broken or missing.

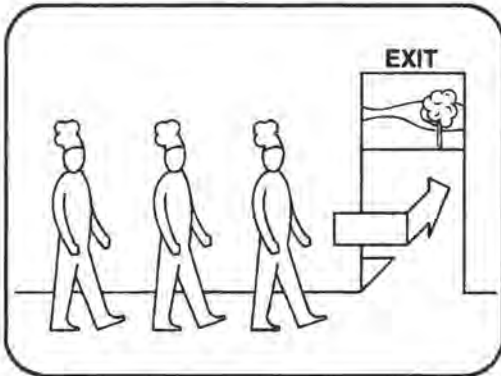
4. At daily intervals check your system for loose pipes and missing or grease covered nozzle caps. Make certain nozzle caps are in place over the ends of each nozzle. Temporarily remove cap, check to make certain it is not brittle, and snap back on nozzle.
5. Check each metal blow-off cap and make certain the cap can be turned freely on the nozzle.
6. Periodically check your visual indicator on the releasing unit to make certain the system is cocked.
7. Have your system inspected by an authorized Ansul distributor at a maximum of 6 month intervals and immediately after major hood and duct cleaning. Often fusible links are wired shut during the cleaning process to prevent accidental activation. This will prevent the system from operating automatically. It's also possible that your system might have been disconnected, damaged, or has accumulated excessive deposits of grease causing your system to become inoperative.
8. Check that the manual pull station is not obstructed, has not been tampered with, and is ready for operation.
9. Make certain that each tank and releasing unit is mounted in an area with a temperature range of 32 °F to 130 °F (0 °C to 54 °C).
10. Make certain the agent storage tank is not in an area in which the temperature can exceed 130 °F (54 °C) or can be heated to a temperature exceeding 130 °F (54 °C) due to conductivity through heated discharge piping.

OWNER'S GUIDE

RESTAURANT FIRE SUPPRESSION SYSTEM

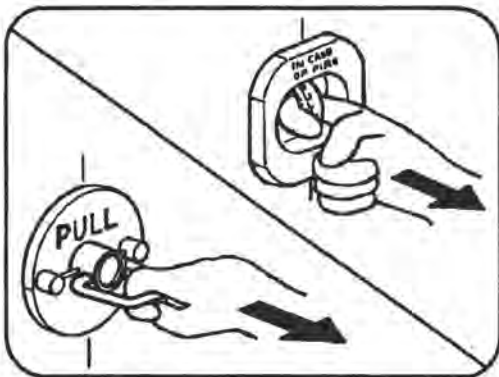
IN THE EVENT OF FIRE IN THE PROTECTED AREA

1. Evacuate others from the premises. In a loud, clear voice say: "WE HAVE A FIRE—PLEASE LEAVE THE BUILDING CAREFULLY, BUT QUICKLY."



001633

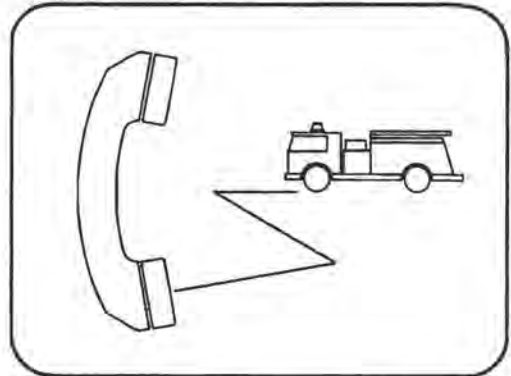
2. If the automatic actuation has not yet taken place, operate the system manually as follows:
 - Pull handle or pull ring straight out on manual pull station with enough force to actuate the fire suppression system.



001634

Once the fire suppression system is actuated, equipment to shut off the fuel supply to the cooking appliances will operate.

3. Call the local fire department.

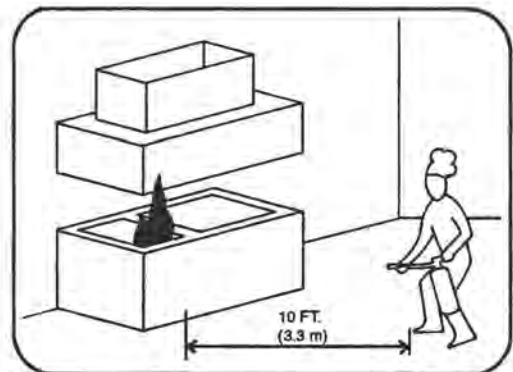


001635


4. Stand by with the appropriate hand portable fire extinguisher.

If you need to use it:

- a. Pull pin
- b. Stand back 10 feet
- c. Aim at base of fire, squeeze handle and sweep side to side



001636

 CAUTION

Do not attempt to extinguish a grease fire with a hand portable fire extinguisher before the Fire Suppression System has been manually or automatically actuated.

OWNER'S GUIDE

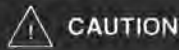
RESTAURANT FIRE SUPPRESSION SYSTEM

BEFORE RESUMING BUSINESS

1. Immediately after discharge, call your authorized Ansul distributor to inspect and recharge your Fire Suppression System.
2. Have your Ansul distributor determine the cause of the system actuation.
3. Area must be cleaned up within 24 hours after discharge using warm water and cleaning detergents.

CLEANUP PROCEDURES

Although there is no unusual cleanup procedure of ANSULEX or ANSULEX LpH agents, due to the alkaline nature of these agents, they should be cleaned from kitchen surfaces within 24 hours after system discharge. The reaction from the wet chemical agent on cooking grease or oil produces a foamy bi-product that can be wiped up with a cloth or sponge. The following procedures should be followed:



CAUTION

Before attempting any cleanup, make certain that all fuel sources to the equipment to be cleaned have been shut off. Make certain that the exhaust hood and all appliance electrical controls have been de-energized to avoid any chance of electrical shock resulting from the cleaning process or from electrically conductive alkaline liquid agent and/or its residue.

Make certain all surfaces to be cleaned have cooled down to room temperature.

Do not use water to clean any appliances that contain hot grease or cooking oils. Doing so may result in violent steaming and/or spattering.

1. The agent is non-toxic; however, food product and cooking grease/oil that has come in contact with the agent will no longer be suitable for human consumption and should be discarded.
2. Sponge as much of the agent as possible using sponges or clean rags. Dispose of these sponges or rags in a local sanitary land fill site in accordance to local authorities.

Note: Wear rubber gloves during cleanup as sensitive skin may become irritated. If the ANSULEX agent or its residue comes in contact with skin or eyes, flush thoroughly with clean water.

3. Using hot, soapy water and either a clean cloth or sponge, wipe away all foamy residue and thoroughly scrub all surfaces that have come in contact with the agent. Note: Wear rubber gloves during cleanup as sensitive skin may become irritated. If the ANSULEX agent or its residue comes in contact with skin or eyes, flush thoroughly with clean water.
4. After thoroughly cleaning all affected surfaces, adequately rinse and allow to completely dry before re-energizing the equipment.

WARRANTY

A. Ansul Products

Except as indicated in B below, your R-102 System is warranted to you as the original purchaser for five years from date of delivery against defects in workmanship and material. Ansul Incorporated ("ANSUL") will replace or repair any metal part which, in its opinion, is defective and has not been tampered with or subjected to misuse, abuse or exposed to highly corrosive conditions.

B. Purchased Products

The following items which are not manufactured but purchased by ANSUL are warranted against defects resulting from the manufacturer's fabrication, process or parts for one year from the date of purchase: detectors, electric manual pull station, time delay relays, thermostats, solenoids, switches, fuel shut-off valves, and pressure relief valves. Evaluation of each reportedly defective relay, valve, etc., returned to ANSUL will be made by the original manufacturer or an agent thereof and their judgment shall be final.

- C. Except as provided in A and B, there are no warranties, express or implied made by ANSUL, concerning this system. There are no implied warranties of FITNESS FOR PURPOSE OR MERCHANTABILITY. ANSUL shall have no liability for consequential, special or similar damages.

For repairs, parts and service of the Ansul System, contact your local Ansul representative, or Ansul Incorporated, Marinette, Wisconsin 54143-2542; 800-TO-ANSUL (862-6785).

ANSUL and ANSULEX are registered trademarks.

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 8 QUANTITY- 001

DESCRIPTION- EXHAUST FAN NIC/BY MC

MANUFACTURER-

MODEL NUMBER-

SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
KW (MOTORS)	HP	AMPS	

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 9 QUANTITY- 001
DESCRIPTION- MAKE UP AIR UNIT NIC/BY MC
MANUFACTURER--
MODEL NUMBER--
SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 10 QUANTITY- 001

DESCRIPTION- WALL CABINET

MANUFACTURER- SERVCO - FABRICATION

MODEL NUMBER-

SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)		AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

**NO OPERATION AND
MAINTENANCE MANUAL AVAILABLE**

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 11 QUANTITY- 001

**NO OPERATION AND
MAINTENANCE MANUAL AVAILABLE**

DESCRIPTION- POT SINK/PREP COUNTER

MANUFACTURER- SERVCO - FABRICATION

MODEL NUMBER-

SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)		AMPS

STEAM PRESSURE-	TYPE OF GAS-
-----------------	--------------

ACCESSORIES, ATTACHMENTS, OR REMARKS

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 12 QUANTITY- 001

**NO OPERATION AND
MAINTENANCE MANUAL AVAILABLE**

DESCRIPTION- HAND SINK

MANUFACTURER- UNIVERSAL STAINLESS/PRIDE

MODEL NUMBER- HSE-21

SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

UNIVERSAL STAINLESS HAND SINK MODEL #
HSE-21. WITH SKIRTING. STAINLESS STEEL
WITH ALL CORNERS COVERED. 1-1/2" CRUMB
CUP TYPE DRAIN. CHROME PLATED TAILPIECE
AND "P" TRAP. DELETE FAUCET, PROVIDE 4"
O. C. FAUCET HOLES FOR A FISHER #80691
SPLASH MOUNTED FAUCET. 14 GAUGE STAIN-
LESS STEEL WALL BRACKET MOUNTED TO EACH
SIDE AT 2'-6" ABOVE FLOOR.

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 13 QUANTITY- 001
DESCRIPTION- DISPENSER-TOWEL/SOAP/NIC/BY OWNER
MANUFACTURER-
MODEL NUMBER-
SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
KW	(MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3187

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 14 QUANTITY- 001

**NO OPERATION AND
MAINTENANCE MANUAL AVAILABLE**

DESCRIPTION- WORK TABLE

MANUFACTURER- SERVCO - FABRICATION

MODEL NUMBER-

SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 15 QUANTITY- 001

NO OPERATION AND
MAINTENANCE MANUAL AVAILABLE

DESCRIPTION- WALL SHELF

MANUFACTURER- SERVCO - FABRICATION

MODEL NUMBER-

SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
KW	(MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 16 QUANTITY- 001

DESCRIPTION- COLD FOOD STATION NIC/FUTURE

MANUFACTURER-

MODEL NUMBER-

SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 17 QUANTITY- 001
DESCRIPTION- HOT FOOD STATION NIC/FUTURE
MANUFACTURER-
MODEL NUMBER-
SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 18 QUANTITY- 001

DESCRIPTION- ROLLING DOOR NIC/BY ARCH.

MANUFACTURER-

MODEL NUMBER-

SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 19 QUANTITY- 001

DESCRIPTION- STAINLESS STEEL SILL

MANUFACTURER- SERVCO - FABRICATION

MODEL NUMBER-

SERVICES

ELECTRIC-

VOLTS

PHASE

CYCLE

KW (MOTORS)

HP

AMPS

STEAM PRESSURE-

TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

**NO OPERATION AND
MAINTENANCE MANUAL AVAILABLE**

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 20 QUANTITY- 001

DESCRIPTION- HOT FOOD CABINET, NIC

MANUFACTURER-

MODEL NUMBER-

SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 21 QUANTITY- 001

NO OPERATION AND
MAINTENANCE MANUAL AVAILABLE

DESCRIPTION- DISH CART

MANUFACTURER- SERVO LIFT EASTERN CORP.

MODEL NUMBER- D122-25

SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SERVO LIFT DISH CART, MODEL #D122-25 WITH STAINLESS STEEL EXTERIOR, ENCLOSED WITH STAINLESS STEEL HINGED DOORS, DUAL-SIDED TWO (2) COATED DISH DIVIDERS, ONE (1) EACH SIDE. POLYURETHANE CASTERS WITH POSI-LOCK BRAKES AND ROTARY BUMPERS.

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 22 QUANTITY- 001

NO OPERATION AND
MAINTENANCE MANUAL AVAILABLE

DESCRIPTION- WORKTABLE W/SINK

MANUFACTURER- SERVCO - FABRICATION

MODEL NUMBER-

SERVICES

ELECTRIC-

VOLTS

PHASE

CYCLE

KW

(MOTORS)

HP

AMPS

STEAM PRESSURE-

TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SERVO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 23 QUANTITY- 001

DESCRIPTION- UNDERCOUNTER DISHMACHINE

MANUFACTURER- HOBART CORPORATION

MODEL NUMBER- LXIH-4

SERVICES

ELECTRIC- 120 VOLTS 1 PHASE CYCLE
7.5 KW (MOTORS) 3/4 HP AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

HOBART UNDERCOUNTER DISHMACHINE MODEL #
LXIH-4 WITH BOOSTER HEATER. FOUR (4) PEG
TYPE RACKS AND TWO (2) FLAT RACKS. LED
DISPLAY OF CYCLES AND TEMPERATURES.
SOLID STATE MICRO-COMPUTER CONTROLS OF
WATER TEMPERATURE, TANK HEAT AND MOTOR
PROTECTION. STAINLESS STEEL INTERIOR,
STAINLESS STEEL INTERIOR, STAINLESS
STEEL PUMP AND IMPELLER. AUTOMATIC FILL.
RINSE AID PUMP. 7.5 KW ELECTRIC TANK
HEAT. 3/4 HP MOTOR. STAINLESS STEEL
FRONT AND SIDE PANELS. 120/208/1 PHASE.

INSTRUCTIONS



LXi SERIES DISHWASHER

LXi SERIES DISHWASHER

MODELS

<i>LXiC</i>	<i>ML-130016</i>
<i>LXiH</i>	<i>ML-130017</i>
<i>LXiGC</i>	<i>ML-130018</i>
<i>LXiGH</i>	<i>ML-130019</i>



701 S. RIDGE AVENUE
TROY, OHIO 45374-0001

937.332.3000

www.hobartcorp.com

FORM 34779 Rev. A (Feb. 2003)

TABLE OF CONTENTS

GENERAL	4
INSTALLATION	5
Unpacking	5
Location	5
Leveling	5
Water Requirements	5
Plumbing Connections	6
Electrical Connection	7
Electrical Data	7
Detergent and Rinse Aid	8
Operator Programming Mode	9
Chemical Sanitizer (LXiC and LXiG)	12
OPERATION	12
Before First Use	12
Controls	12
Operating the LXi Dishwasher	13
Diagnostic Messages	14
Wash/Rinse Cycle Times (LXi)	14
Wash/Rinse Cycle Times (LXiG)	14
Preparation	15
Do's and Don'ts For Your New Hobart Dishwasher	16
CLEANING	17
Priming Chemical Pumps	18
MAINTENANCE	19
Deliming	19
Lubrication	19
TROUBLESHOOTING	20

Installation, Operation and Care of LXi SERIES DISHWASHERS

SAVE THESE INSTRUCTIONS



GENERAL

The LXi Series dishwashers are fully automatic, front-loading dishwashing machines that are equipped with a $\frac{3}{4}$ horsepower electric motor.

All LXi Series dishwashers shut down automatically 4 hours after last use to conserve energy.

All LXiH and LXiGH dishwashers include *Sense-a-Temp*[™] to insure proper hot water temperature during rinse.

Standard equipment includes two 20" x 20" racks, electronic controls, pumped drain, fill hose and drain hose.

MODEL	DESCRIPTION
LXiC	Fresh water rinse; low-temperature, chemical-sanitizing models for use with 5.25% or 8.40% sodium hypochlorite solution (bleach) as the sanitizing agent.
LXiH	Fresh water rinse with a built-in 70°F rise booster heater. This allows an incoming water temperature of 110°F.

INSTALLATION

UNPACKING

Immediately after unpacking the dishwasher, check for possible shipping damage. If this machine is found to be damaged, save packaging material and contact the carrier within 15 days of delivery.

LOCATION

Prior to installation, verify that the electrical supply agrees with the specifications on the machine data plate, which is located on the front of the dishwasher.

Steam generated from normal operation may escape from the door. Wood, laminates, veneers, etc. are unsuitable materials for use in areas exposed to dishwasher steam and detergents. Stainless steel or other moisture-resistant shields are recommended for surfaces adjacent to LXi sides and top.

LEVELING

The machine must be level to operate properly. Place the dishwasher in its operating location. Level the machine before any connections are made. Using a carpenter's level placed diagonally on the rack tracks, level the machine front to back and side to side by threading the adjustable feet in or out. After leveling the machine, cover the exposed threads of the adjustable feet with black rubber tubing supplied. (See separate instructions furnished with machine.)

WATER REQUIREMENTS

Proper water quality can improve warewashing performance by reducing spotting, lowering chemical supply costs, enhancing effectiveness of labor and extending equipment life. Local water conditions vary from one location to another. The recommended proper water treatment for effective and efficient use of this equipment will also vary depending on the local water conditions. Ask your municipal water supplier for details about local water specifics prior to installation.

Recommended water hardness is 4 - 6 grains of hardness per gallon. Chlorides must not exceed 50 parts per million. Water hardness above 6 grains per gallon should be treated by a water conditioner (water softener or in-line treatment). Water hardness below 4 grains per gallon also requires water treatment to reduce potential corrosion. Water treatment has been shown to reduce costs associated with machine cleaning, reduce deliming of the dishwasher, reduce detergent usage and reduce corrosion of metallic surfaces in the booster water heater and dishwasher.

Sediment, silica, chlorides or other dissolved solids may lead to a recommendation for particulate filtration or reverse osmosis treatment.

If an inspection of the dishwasher or booster heater reveals lime buildup after the equipment has been in service, in-line treatment should be considered and, if recommended, should be installed and used as directed. Contact your local Hobart Service Office for specific recommendations.

Water Supply

A water hammer arrestor (meeting ASSE-1010 Standard or equivalent) should be installed (supplied by others) in the common water supply line at the service connection.

Water must be proper hardness. Higher hardness may cause excessive formation of lime scale.

The plumber who connects this machine is responsible for making certain that water lines are THOROUGHLY FLUSHED OUT BEFORE connecting to the dishwasher. This "flush-out" is necessary to remove all foreign matter, such as chips (resulting from cutting or threading of pipes) pipe joint compound from the lines; or, if soldered fittings are used, bits of solder or cuttings from the tubing. Debris, if not removed, may lodge in the dishwasher's plumbing components and render them inoperative. Manual valves or solenoid valves fouled by foreign matter and any expenses resulting from this fouling, are NOT the responsibility of the manufacturer.

Water supply requirements are as follows:

MODEL	TEMPERATURE	FLOWING PRESSURE
LXiC	140°F Minimum	15 to 25 psi
LXiH	110°F Minimum	15 to 25 psi

If flowing pressure exceeds 25 psi, a pressure reducing-valve (not supplied) must be installed in the supply line.

CAUTION: The water pressure regulator must have a relief bypass. Failure to use the proper type of pressure regulator may result in damage to the unit.

If flowing pressure is less than 15 psi, improper machine operation may result.

A manual shutoff valve (not supplied) should be installed upstream of the fill hose to accommodate servicing the machine.

It is recommended that a line strainer (not supplied) be installed in the supply line between the manual shutoff valve (not supplied) and the connection point on the machine. Make plumbing connections with 1/2" minimum copper piping OD (3/4" recommended), with a 3/4" male garden hose fitting (not supplied). See installation diagrams, pages 10-11.

NOTE: Iron in the water supply can cause staining. An iron filter is recommended for iron concentration greater than 0.1 part per million. High chloride levels in the water supply can cause pitting. A chloride removal system is required if levels exceed 50 parts per million.

PLUMBING CONNECTIONS

WARNING: PLUMBING CONNECTIONS MUST COMPLY WITH APPLICABLE SANITARY, SAFETY AND PLUMBING CODES.

Drain

A drain hose is provided with a 3/4" pipe connection adapter. This should be securely plumbed into the sink drain. Use care not to kink hose. See installation diagrams in this manual. Drain must have a minimum flow capacity of 10 gallons per minute.

ELECTRICAL CONNECTION

WARNING: ELECTRICAL AND GROUNDING CONNECTIONS MUST COMPLY WITH THE APPLICABLE PORTIONS OF THE NATIONAL ELECTRICAL CODE AND/OR OTHER LOCAL ELECTRICAL CODES.

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

ELECTRICAL DATA

Complied in accordance with the National Electrical Code NFPA-70, latest addition.

NOTE: For supply connections, use copper wire only rated at 90°C minimum.

Model	Volts/Hertz/Phase	Minimum Supply Circuit Conductor Ampacity	Maximum Protective Device Ampacity
LXiC LXiGC	120/60/1	20	20
	208-240/60/1		
	120/208-240(3W)/60/1*		
LXiH LXiGH	208/240/60/1	50	50
	120/208-240(3W)/60/1*		
	208-240/60/3	35	35
	380-400/60/3	25	25
	480/60/3	20	20
LXiH	220-240/50/1	50	50

*The (3W) systems require three power wires that include a current carrying neutral. An additional fourth wire must be provided for machine ground.

Depending on the voltage available at your electrical service, set the voltage selection switch, located in control drawer underneath service ground, to 208 or 240 volts.

Refer to the data plate on the door handle of the machine and the label inside the control drawer at the power connection for proper selection.

Use stranded copper wire suitable for at least 90°C.

Connection Method

1. Remove the cover plate at the upper right in the back of the machine (Fig. 1). A hole for 1" trade size conduit is supplied in the cover plate.



Fig. 1

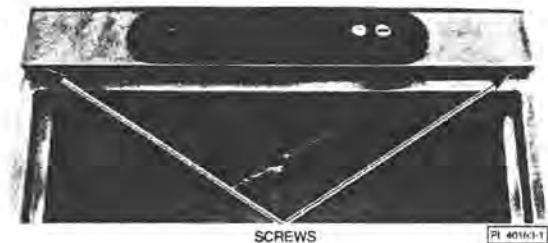


Fig. 2

2. Remove the two screws (Fig. 2) securing the controls drawer and open it fully.
3. Install 1" trade conduit and fitting to the cover plate. A 90 degree fitting is recommended.
4. Feed wires over top of tank to individual strain reliefs at rear of drawer. At least 32" and not more than 36" of the required wire size must extend from the end of the conduit fitting.
5. Reinstall the cover plate (three screws, Fig. 1).
6. For all wires, run one wire through each individual strain relief. (Four strain reliefs are provided.) Make electrical connections according to wiring diagram supplied with the machine and secure wires to the machine service connection. Keep excess wire in the drawer to a minimum.
7. Tighten the set screw on the strain relief(s) until they bottom out (on the shoulder of the body).
8. Close the control drawer and replace the screws.

DETERGENT AND RINSE AID

Use only commercial-grade detergents recommended by your chemical professional. Do not use detergents formulated for residential dishwashers.

The detergent and rinse aid pump "ON" times are factory-set. If adjustments are required, contact your local Hobart Service Office.

Place the detergent and rinse aid containers (which are obtained from an independent supplier) in a location where the delivery tubes will reach them.

Remove the detergent bottle cap and put the *red* delivery tube in the detergent container.

Remove the rinse aid bottle cap and place the *blue* delivery tube in the rinse aid container.

Be sure to push the delivery tube standpipes completely to the bottom of each container. Check to make sure there are no obstructions or kinks in the delivery tubes.

OPERATOR PROGRAMMING MODE

The Operator Programming mode allows changes to be made from factory settings to the chemical pumps operation. This includes the Detergent and Rinse Aid pumps, but does not apply to the Sanitizer pump on the LXiC and LXiGC models. The Detergent and/or Rinse Aid pumps can be turned off by entering this programming mode. Disabling this feature will eliminate the alarm activation if no chemical is sensed and turn the chemical pumps off. Machines not equipped with Hobart chemical pumps do not have this programming mode.

1. To begin the process start with the machine off.
2. First press the ON key, then **immediately** press and hold the OFF key to enter the user programming mode. While the OFF key is being pressed the display will begin counting from "11" going up to "99". Hold the OFF key until the counting ends and "WASH" and "Pr" is displayed on the LED panel (Fig. 3). This indicates you are now in the programming mode. (The OFF key must be pressed prior to the count reaching "44".)



Fig. 3

NOTE: If the "WASH" and "Pr" icons do not appear and the machine is equipped with the chemical pumps, turn the unit off and try steps 1 through 3 again.

3. Press the WASH key to advance into the programming mode.

NOTE: The machine will shut off in 15 seconds if either the WASH key or the OFF key are not pressed. To regain access to this mode follow steps 1 through 3.

4. The "DETERGENT" icon will now display either "On" or "OF" (Figs. 4 and 5). Pressing the WASH key in either the Detergent or Rinse Aid mode changes the selection from "On" to "OF". When the desired change is made press the OFF key to advance to the next mode.



Fig. 4



Fig. 5

NOTE: "On" indicates the Detergent or Rinse Aid pump will run and be sensed. "OF" indicates the Detergent or Rinse Aid pump is disabled, meaning it will not run or be sensed.

5. Pressing the OFF key advances to the Rinse Aid mode showing "On" or "OF". Press the WASH key to change to desired setting.
6. When desired changes are completed allow the machine to turn itself off. It will do this automatically after 15 seconds if no keys are depressed. The machine has saved changes and is ready for use.

WARNING:

REQUIRED FLOWING WATER PRESSURE TO THE DISHWASHER IS 20 ± 5 PSIG. IF PRESSURES HIGHER THAN 25 PSIG ARE PRESENT, A PRESSURE REGULATING VALVE MUST BE INSTALLED IN THE WATER LINE TO THE DISHWASHER (BY OTHERS).

IMPORTANT: THE SODIUM HYPOCHLORITE (LIQUID BLEACH) CONTAINER SHOULD BE PLACED NO HIGHER THAN 10" ABOVE FLOOR.

IF BLEACH CONTAINER IS TO BE PLACED IN CABINET ADJACENT TO MACHINE, A 1/8" DIA HOLE IS REQUIRED IN THE CABINET TO RUN BLEACH SUPPLY LINE.

USE ONLY 5, 25 OR 45 SODIUM HYPOCHLORITE (LIQUID BLEACH) AS SANITIZING CHEMICAL TO INSURE PROPER OPERATION OF DISHWASHER.

DO NOT PRE-HEAT SETTING AGENT AND SODIUM HYPOCHLORITE (LIQUID BLEACH). CERTAIN MATERIALS INCLUDING SILVER PLATE, ALUMINUM AND PEXES ARE ATTACKED BY SODIUM HYPOCHLORITE (LIQUID BLEACH). SEE INSTRUCTIONAL MANUAL.

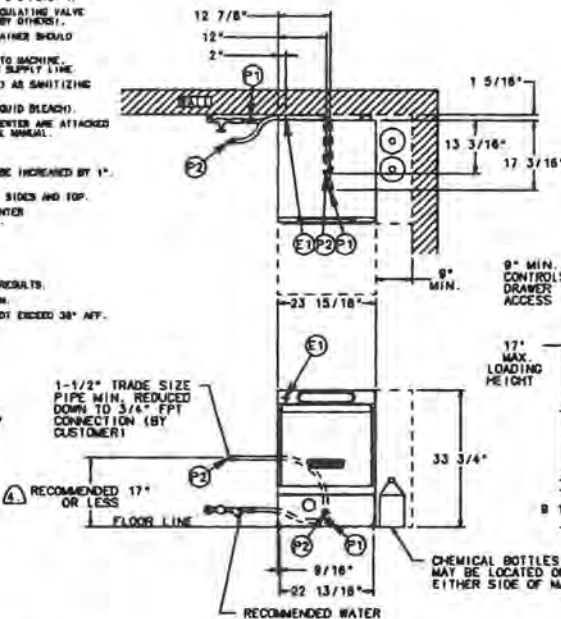
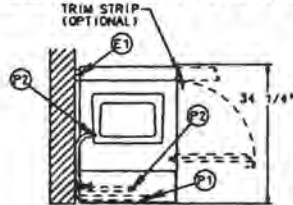
NOTES:

1. ALL VERTICAL MACHINE DIMENSIONS TAKEN FROM FLOOR MAY BE INCREASED BY 1".
2. MOIST AIR ESCAPES FROM THE DOOR.
3. USE ONLY MOISTURE RESISTANT MATERIALS ADJACENT TO LXI SIDES AND TOP.
4. A VENT HOOD IS NOT RECOMMENDED ABOVE THE LXI UNDERCOUNTER DISHWASHER SINCE IT DOES NOT PRODUCE EXCESSIVE VAPOR.

PLUMBING NOTES:

1. WATER MAINS PRESSURE (MEETING ASSE-1018 STANDARD OR EQUIVALENT) TO BE SUPPLIED (BY OTHERS) TO COMMON WATER SUPPLY LINE A) SERVICE CONNECTION.
2. RECOMMENDED WATER HARDNESS TO BE 4-8 GRAINS FOR BEST RESULTS.
3. MINIMUM WATER CONDUCTIVITY REQUIRED - 36 MICRO-HARDNESS.

⚠ IF DRAIN HOSE IS LOOPED ABOVE A SINK, THE LOOP MUST NOT EXCEED 36" AFF.



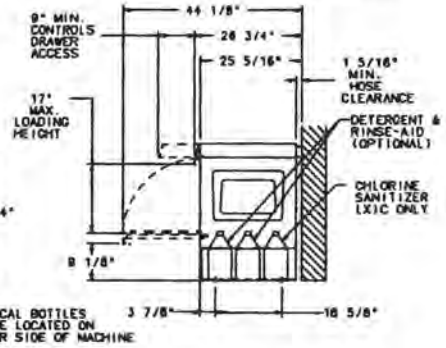
CONNECTION INFORMATION
(AFF = ABOVE FINISHED FLOOR)

LEGEND

- E1 ELECTRICAL CONNECTION: 1-3/8" DIA. HOLE FOR 1" TRADE SIZE CONDUIT; 31-3/4" AFF.
- P1 SINGLE FILL AND RINSE CONNECTION: 3/4" FEMALE GARDEN HOSE FITTING ON 8" LONG HOSE SUPPLIED WITH MACHINE; 33" F WATER MIN. FOR LXIC & LXIH; 1-1/2" AFF.
- P2 DRAIN CONNECTION: 3/4" NPT FITTING WITH 8" LONG HOSE SUPPLIED WITH MACHINE; 5-9/16" AFF.

WARNING

ELECTRICAL AND GROUNDING CONNECTIONS MUST COMPLY WITH THE APPLICABLE PORTIONS OF THE NATIONAL ELECTRICAL CODE AND/OR OTHER LOCAL ELECTRICAL CODES. PLUMBING CONNECTIONS MUST COMPLY WITH APPLICABLE SANITARY, SAFETY AND PLUMBING CODES. DRAIN AND FILL LINE CONFIGURATIONS VARY, SOME METHODS ARE SHOWN ON THIS DRAWING.



MACHINE TYPE & SPECIFICATION	RATED AMPS	MIN SUPPLY WIRE CAPACITY	SEE PROTECTIVE DEVICE
LXIC (128/88/1) USE 80°C STRANDED COPPER WIRE ONLY.	15.4	30	20
LXIC (128/108/88/108/111) USE 80°C STRANDED COPPER WIRE ONLY.	13.8	30	24
LXIC (128-108/88/1) USE 80°C STRANDED COPPER WIRE ONLY.	13.6	30	20
LXIH (128/108/88/111) USE 80°C STRANDED COPPER WIRE ONLY.	37.7	50	30
LXIH (128-108/88/1) USE 80°C STRANDED COPPER WIRE ONLY.	37.7	50	30
LXIH (128-108/88/1) USE 80°C STRANDED COPPER WIRE ONLY.	38.1	50	34
LXIH (128-108/88/2) USE 80°C STRANDED COPPER WIRE ONLY.	28.5	40	40
LXIH (128-108/88/2) USE 80°C STRANDED COPPER WIRE ONLY.	14.8	30	20
LXIH (128-108/88/2) USE 80°C STRANDED COPPER WIRE ONLY.	17.1	35	28

* THIS SYSTEM REQUIRES THREE POWER WIRES WHICH INCLUDES A CURRENT CARRYING NEUTRAL, AN ADDITIONAL FOURTH WIRE MUST BE PROVIDED FOR MACHINE GROUND.

MODELS:
LXIC, LXIH
892882

ACCESSORY CORD KIT AVAILABLE FOR ALL MACHINES

SHIPPING WEIGHTS	LXIC	LXIH
NET WEIGHT OF MACHINE	190 LBS	210 LBS
DOMESTIC SHIPPING WEIGHT	235 LBS	255 LBS

INSTALLATION DIAGRAM (LXIC & LXIH)

WARNING

REQUIRES FLOWING WATER PRESSURE TO THE GLASSWASHER IS 20 ± 5 PSIG. IF PRESSURES HIGHER THAN 25 PSIG ARE PRESENT, A PRESSURE REGULATING VALVE MUST BE INSTALLED IN THE WATER LINE TO THE GLASSWASHER (BY OTHERS).

IMPORTANT: THE SODIUM HYPOCHLORITE (LIQUID BLEACH) CONTAINER SHOULD BE PLACED NO HIGHER THAN 18" ABOVE FLOOR.

IF BLEACH CONTAINER IS TO BE PLACED IN CABINET ADJACENT TO GLASSWASHER, A 1/2" DIA HOLE IS REQUIRED IN THE CABINET TO RUN BLEACH SUPPLY LINE.

USE ONLY 5.25 OR 9.45 SODIUM HYPOCHLORITE (LIQUID BLEACH) AS SANITIZING CHEMICAL TO INSURE PROPER OPERATION OF DISHWASHER.

DO NOT PRE-MIX SODIUM HYPOCHLORITE (LIQUID BLEACH).

CERTAIN MATERIALS INCLUDING SILVER PLATE, ALUMINUM AND PEXTER ARE ATTACKED BY SODIUM HYPOCHLORITE (LIQUID BLEACH). SEE INSTRUCTION MANUAL.

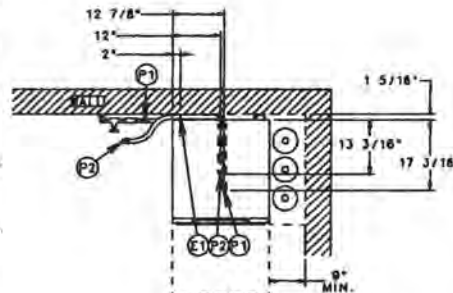
NOTES:

1. ALL VERTICAL MACHINE DIMENSIONS TAKEN FROM FLOOR MAY BE INCREASED BY 1".
2. NOISE AIR ESCAPES FROM THE DOOR. USE ONLY NOISE RESISTANT MATERIALS ADJACENT TO LXIG DISHES AND TOP.
3. A VENT HOLE IS NOT RECOMMENDED ABOVE THE LXIG UNDCOUNTER GLASSWASHER SINCE IT DOES NOT PRODUCE EXCESSIVE VAPORS.

PLUMBING NOTES:

1. WATER HARDNESS (MEETING ASSE-1018 STANDARD OR EQUIVALENT) TO BE SUPPLIED (BY OTHERS) IN COMMON WATER SUPPLY LINE AT SERVICE CONNECTION.
2. RECOMMENDED WATER HARDNESS TO BE 4-8 GRAINS FOR BEST RESULTS.
3. MINIMUM WATER CONDUCTIVITY REQUIRED - 38 MICRO-HARD/CM.

⚠ IF DRAIN HOSE IS LOOPED ABOVE A SINK, THE LOOP MUST NOT EXCEED 38" AFF.



CONNECTION INFORMATION
(AFF = ABOVE FINISHED FLOOR)

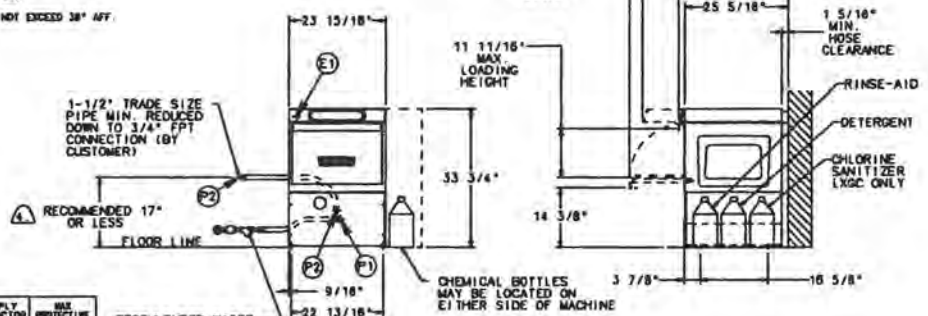
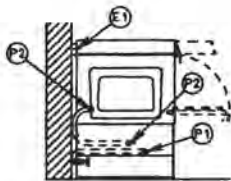
LEGEND

- E1 ELECTRICAL CONNECTION: 1-3/8" DIA. HOLE FOR 1" TRADE SIZE CONDUIT; 31-3/4" AFF.
- P1 SINGLE FILL AND RINSE CONNECTION: 3/4" FEMALE GARDEN HOSE FITTING ON 3" LONG HOSE SUPPLIED WITH MACHINE; 14 3/8" WATER MIN. FOR LXIGC & LXIGH; 1-1/2" AFF.
- P2 DRAIN CONNECTION: 3/2" NPT FITTING WITH 9" LONG HOSE SUPPLIED WITH MACHINE; 5-8/16" AFF.

WARNING

ELECTRICAL AND GROUNDING CONNECTIONS MUST COMPLY WITH THE APPLICABLE PORTIONS OF THE NATIONAL ELECTRICAL CODE AND/OR OTHER LOCAL ELECTRICAL CODES.

PLUMBING CONNECTIONS MUST COMPLY WITH APPLICABLE SANITARY SAFETY AND PLUMBING CODES. DRINK AND FILL THE DISHWASHERS VARY SOME METHODS ARE SHOWN ON THIS DRAWING.



MACHINE TYPE & SPECIFICATION	RATED AMPS	MIN SUPPLY CRY CONDUCTION CAPACITY	MIN PROTECTIVE DEVICE
LXIGC (1150/80/1) USE 80°C STRANDED COPPER WIRE ONLY.	15.4	20	20
LXIGC (1150/250-240/30/10/11) USE 80°C STRANDED COPPER WIRE ONLY.	15.4	20	20
LXIGH (1100-140/80/1) USE 80°C STRANDED COPPER WIRE ONLY.	15.8	20	20
LXIGH (1150/200-240/30/10/11) USE 80°C STRANDED COPPER WIRE ONLY.	17.7	30	30
LXIGH (1200-140/80/1) USE 80°C STRANDED COPPER WIRE ONLY.	17.7	30	30
LXIGH (1200-240/80/1) USE 80°C STRANDED COPPER WIRE ONLY.	20.6	40	40
LXIGH (1400/80/1) USE 80°C STRANDED COPPER WIRE ONLY.	14.8	20	20
LXIGH (1380-400/80/1) USE 80°C STRANDED COPPER WIRE ONLY.	17.1	25	25

RECOMMENDED WATER SERVICE ROUGH-IN 1/2" 1/2" TRADE SIZE PIPE MIN. W/SHUTOFF VALVE, LINE STRAINER & 3/4" MALE GARDEN HOSE FITTING (BY CUSTOMER).

* THIS SYSTEM REQUIRES THREE POWER WIRES WHICH INCLUDES A CURRENT CARRYING NEUTRAL, AN ADDITIONAL FOURTH WIRE MUST BE PROVIDED FOR MACHINE GROUND.

ACCESSORY CORD KIT AVAILABLE FOR ALL MACHINES

MODELS:
LXIGC, LXIGH
892801

SHIPPING WEIGHTS	LXIGC	LXIGH
NET WEIGHT OF MACHINE	194 LBS	214 LBS
DOMESTIC SHIPPING WEIGHT	239 LBS	259 LBS

INSTALLATION DIAGRAM (LXIGC & LXIGH)

CHEMICAL SANITIZER (LXiC AND LXIGC)

CAUTION: Items such as pewter, aluminum and silver will be attacked by sodium hypochlorite (bleach). Therefore, chemical-sanitizing dishwashers should not be used to wash such items.

On model LXiC only, the chemical sanitizer pump is factory-set for use with 5.25% sodium hypochlorite solution. If 8.40% sodium hypochlorite solution is to be used, contact your local Hobart Service Office.

Place a 1-gallon bottle of 5.25% or 8.40% sodium hypochlorite solution (bleach) in a suitable location no higher than 10 inches off the floor. Do not pre-mix sanitizing solution with water or any other liquid.

WARNING: NEVER PREMIX A WETTING AGENT WITH THE SANITIZING SOLUTION. MIXING MAY CAUSE HAZARDOUS GAS TO FORM.

Remove the sanitizer bottle cap and place the *white* delivery tube in the sanitizer container. Be sure to push the delivery tube standpipe completely to the bottom of the container. Check to make sure there are no obstructions or kinks in the delivery tube.

The LXi Series Dishwasher has an auto-prime cycle. (See Operating the LXi Dishwasher.)

Frequently check your sanitizer bottle to make sure there is a sufficient chemical supply.

OPERATION

CAUTION: Items such as pewter, aluminum and silver will be attacked by sodium hypochlorite (bleach). Therefore, chemical-sanitizing dishwashers should not be used to wash such items.

If your dishwasher is a chemical-sanitizing model, frequently check the sanitizer bottle to make sure there is a sufficient chemical supply.

BEFORE FIRST USE

This machine must be cleaned after installation and before being put into operation. (See Cleaning.)

CONTROLS



Fig. 6

OPERATING THE LXi DISHWASHER

DO THIS	DISPLAY SHOWS	REMARKS
Press ON.	Model number.	Dishwasher performs self-check. This takes 5-10 seconds.
	FILL lit and sump temperature displayed when machine is filling. Fill <i>flashes</i> when booster is preheating on model LXiH. This preheat could take up to 8 minutes.	Dishwasher fills with water. When filled, pump turns on for 10 seconds. If door is opened during fill cycle, fill will stop. After door is closed, the process continues where it stopped. If WASH is pressed during a fill cycle, a wash cycle will begin at end of fill cycle. If beeper sounds and machine will not fill, turn circuit breaker off, then on, and try again. If problem persists, contact your local Hobart Service Office.
	During fill, sump temperature is displayed.	When filled, machine will maintain an idle state. Heat is maintained in both booster and/or sump.
Open door; slide rack of dishes into dishwasher and add detergent. Close door.	Sump temperature.	If your Model LXi Series is equipped with the optional detergent pump, detergent will be added automatically during wash cycle.
Press WASH.	WASH lit; sump temperature displayed during wash cycle.	Machine initiates a wash and rinse cycle. If door is opened during wash cycle, cycle will restart from beginning when door is closed.
	RINSE lit; rinse temperature displayed during rinse cycle.	If door is opened during rinse or drain cycle, cycle will continue at point where door was opened upon closing door. If OFF is pressed during cycle, machine will drain and shut down.
When cycle is complete, reload machine for next wash/rinse cycle; or, if not in use, machine will maintain idle mode.	Sump temperature.	Machine will drain and shut down if the programmed idle shutdown time is reached.
At the end of day, press OFF.	If water is present in the sump, "Pd" is displayed then the display shuts down.	When OFF key is pressed, machine will drain and shut down.

DIAGNOSTIC MESSAGES

In the event of a problem with a temperature probe, the display will flash P1, P2 or P3 every second. The respective heaters will shut down. Other functions will continue to operate normally. Contact your local Hobart Service Office.

Drain and fill error messages are displayed as E0, E1, E2, E3, E4, E5, E6 or E7. In all cases, the dishwasher will terminate current cycle operations, turn off all heat sources and display the message until the OFF button is pressed. (A power drain will not occur when turned off.) (See Troubleshooting.) If problem persists, contact your local Hobart Service Office.

If the control detects that the water level probe is becoming less sensitive, CL and Pr are displayed in the control window. Clean all three water level probes. (See Cleaning.)

WASH/RINSE CYCLE TIMES (LXi)

Wash 85 Sec.**

Drain* 10 Sec. Max.

Dwell 4 Sec.

Rinse 10 Sec.

Dwell 6 Sec.

* Drains off about 1 gallon of water.

** Maximum wash time varies, depending on operation voltage and incoming water temperature for 70°F rise.

WASH/RINSE CYCLE TIMES (LXiG)

Wash 56 Sec.**

Drain 10 Sec. Max.

Dwell 4 Sec.

Rinse 10 Sec.

Dwell 6 Sec.

** Maximum wash time varies, depending on operation voltage and incoming water temperature for 70°F rise.

PREPARATION

Make sure the coarse (Fig. 7) and fine (Fig. 8) strainers are in place and free of debris. Check both wash arms and rinse arms to make sure they spin freely and are not clogged.

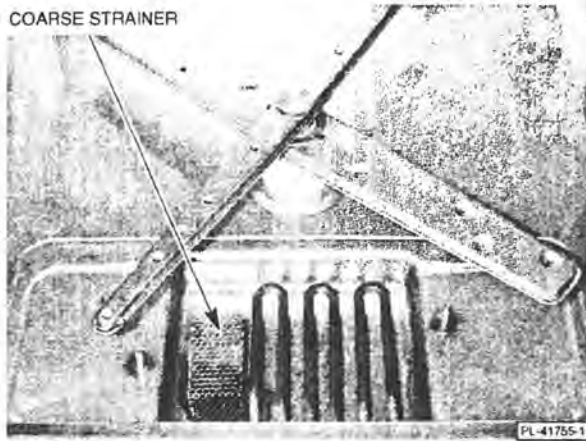


Fig. 7



Fig. 8

Dishes must be scraped and/or rinsed to remove food particles and other debris. Never use steel wool on ware to be loaded into the dishwasher. Place dishes in a rack. Do not stack dishes on top of each other as water must have free access to all sides of every dish. Stand plates edgewise in a peg-type rack (Fig. 9). Cups, glasses and bowls should lay upside down in an open or compartment-type rack (Fig. 9). Silverware and other small pieces should lay loosely on the bottom of a flat-bottom rack. See Operator Card (supplied) for other loading patterns. Do not allow foreign objects to enter the unit, especially metallic contaminants such as staples and paper clips.

Check to see if any detergent, rinse aid or sanitizer chemicals need to be replenished. Use only commercial-type detergents, as prescribed by your chemical professional.

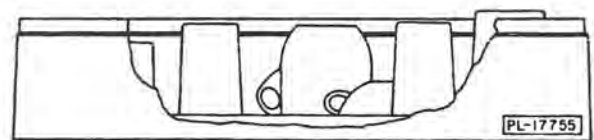
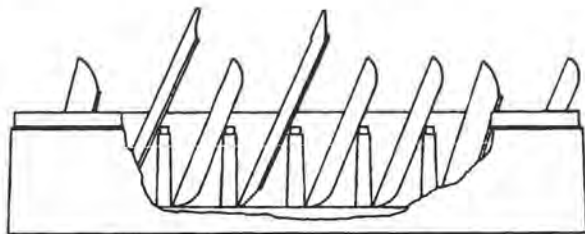


Fig. 9

DO'S AND DON'TS FOR YOUR NEW HOBART DISHWASHER

DO assure proper water hardness.

DO prescrape dishes thoroughly.

DO use only detergents recommended by your chemical professional.

DO, at the end of the day, thoroughly cleanse the machine, rinse and dry. (Leave door open.)

DO closely follow your chemical professional's prescribed deliming schedule.

DO use only products formulated to be safe on stainless steel.

DO NOT oversoften water. (Recommended water hardness is no less than 4 grains per gallon.)

DO NOT use detergents formulated for residential dishwashers.

DO NOT allow food soil to accumulate on the tank bottom.

DO NOT exceed chemical manufacturer's recommended concentrations for detergent, sanitizer, rinse aid or lime scale remover.

DO NOT use steel wool to clean ware or warewasher surface.

DO NOT allow foreign objects to enter the unit, especially metallic contaminants.

NOTE: Failure to follow use, care and maintenance instructions may void your Hobart warewasher warranty.

CLEANING

This machine must be cleaned at least once each working day. Use only products formulated to be safe on stainless steel.

1. Press OFF. The machine will drain. When the display is no longer lit, open the door and remove any debris from the bottom of the tank. Do not allow food soil to accumulate on the tank bottom.
2. Remove the lower rinse arm by unscrewing the knurled knob (Fig. 10). Remove the lower wash arm by pulling the arm off the shaft. Remove the upper rinse and wash arms in the same manner. Remove the coarse and fine strainers. (See Figs. 7 and 8). Thoroughly clean these items in a sink. Remove debris from wash/rinse arm nozzles.

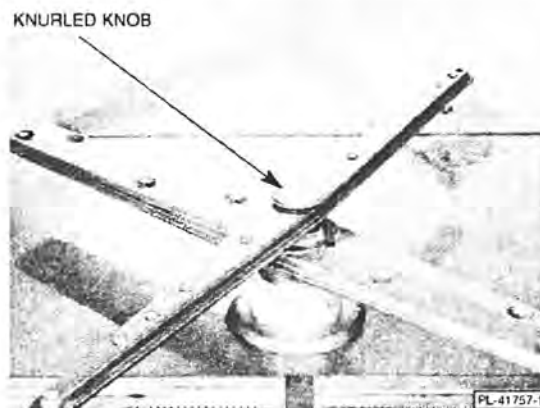


Fig. 10

3. With a damp cloth, wipe the interior of the machine, the water level probes (Fig. 11) and the water level probe (Fig. 12) under the fine strainer. DO NOT use steel wool. Wipe the exterior of the machine. When cleaning the inside of the door, be sure to wipe the lip at the bottom of the door. Remove any remaining debris with a mild cleanser formulated for stainless steel and a soft cloth or brush.



Fig. 11

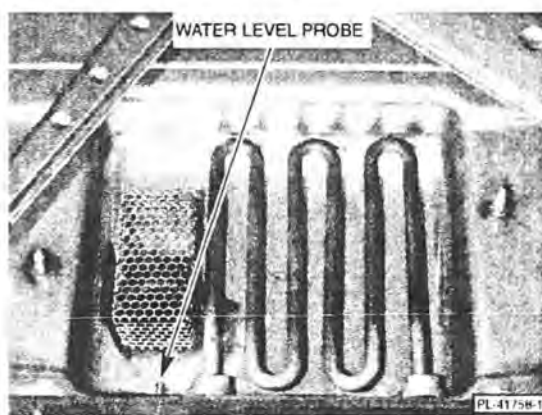


Fig. 12

4. Replace the coarse and fine strainers. Reinstall the lower wash arm by pushing it down on the shaft and then place the lower rinse arm on the shaft and tighten the knurled knob. Spin arms to make sure they spin freely. Repeat this procedure with the upper wash and rinse arms.
5. Use a soft, damp cloth or sponge and mild cleanser to clean the control keypad and display. DO NOT use abrasive or harsh cleaners or scouring pads.
6. Leave the door ajar overnight to allow the interior to air out and dry.

PRIMING CHEMICAL PUMPS

When a chemical becomes empty, the priming operation starts automatically the next time the machine is turned on or a wash cycle is started. This feature is only supported on machines with the chemical sense board installed and where CHEMICAL SENSING is enabled. Note that the initial prime time for all pumps (Detergent, Rinse Agent and Sanitizer) is 60 seconds during which time the chemical icon will flash. If the chemical is not sensed within 60 seconds, the chemical icon will remain lit and the control will beep for about 5 seconds. After the chemical is sensed, the indicator in the display turns off; and the pump continues to prime for 20 seconds to allow the chemicals to reach the machine. If all three chemicals are empty, the sanitizer will prime first followed by detergent and rinse aid. Only one chemical pump will run at a time.

If chemicals are not sensed after three consecutive priming operations, the wrench is displayed along with the empty chemical icon and priming is cancelled. The next time a wash cycle is started, the control will flash the wrench and empty chemical icon as well as beep. This is to prevent the priming operation in case the chemical sensors have malfunctioned. Verify that the chemical bottles are not empty. If they are not empty, the chemical sensor or pumps have malfunctioned; contact your local Hobart Service Office.

The priming operation can be reset by either:

- Pressing the WASH key a second time while the wrench and empty chemical icon is flashing.
- By turning the dishwasher off, then back on.

NOTE: If the use of chemical pumps is not desired, refer to the Operator Programming Mode section.

MAINTENANCE

DELIMING

WARNING: DELIMING SOLUTION, RINSE AGENTS OR ANY OTHER KIND OF ACID MUST NOT COME IN CONTACT WITH BLEACH OR RINSE SOLUTION CONTAINING BLEACH USED IN CHEMICAL-SANITIZING MACHINES. MIXING MAY CAUSE HAZARDOUS GAS TO FORM. THIS ENTIRE PROCEDURE MUST BE FOLLOWED STEP BY STEP FOR SAFE AND SATISFACTORY RESULTS.

CAUTION: Do not allow the deliming agent to remain in the machine longer than recommended by the deliming agent manufacturer.

DELIME THE DISHWASHER ON A REGULAR BASIS AS REQUIRED. The regularity will depend on mineral content of the supply water. Deliming should be done when you can see clear signs of lime deposits (a white, chalky substance) on the inside walls and on the wash arms. LXi models are equipped with an automatic delime cycle reminder. It is recommended that deliming be done when DELIME flashes.

If deliming is necessary, a deliming agent (such as Lime Away or LSR) should be used for best results.

After the preprogrammed number of cycles has expired, which is factory-set for 1500 cycles, the control will indicate the delime request by displaying DELIME. Machine operation will continue as usual. To remove the DELIME icon, you must either enter a delime cycle or reprogram the number of cycles to terminate the DELIME indication. (If the dishwasher needs to be reprogrammed, contact your local Hobart authorized service office.)

1. Remove rack from machine. Close door.
2. Press OFF to power down the dishwasher.
3. Press and hold WASH (DELIME) while pressing ON. The display will show DELIME during the fill cycle.
4. After the fill cycle, the control will prompt you to add delimer by flashing ADD and DELIME. Open the door and add deliming agent. (Carefully follow supplier's instructions.) The sump holds approximately 3 gallons of water.
5. After delimer has been added, close the door. Press the WASH (DELIME) key again to continue the cycle. The machine will enter the wash mode for 5 minutes, then will begin two rinse and drain operations. The DELIME symbol will flash in the display.

NOTE: DO NOT interrupt the cycle. Should the process be interrupted, restart delime procedure from the beginning.

6. After the deliming operation is completed, power to the control will be turned off.
7. Inspect the interior of the machine for lime deposits. If necessary, repeat steps 3 through 7.

LUBRICATION

The pump motor has permanently sealed bearings and requires no lubrication.

TROUBLESHOOTING

This section outlines various symptoms and possible causes that may be encountered in the event of abnormal machine operation. If symptoms persist after possible causes have been checked, service may be required.

Symptom	Possible Causes
No machine operation (no display).	<ol style="list-style-type: none"> 1. Machine OFF - turn machine ON. 2. Blown fuse or circuit breaker off at power supply. 3. Cord not plugged in (corded models only)
No machine operation (with display).	<ol style="list-style-type: none"> 1. Display: "dr" "oP" - open and close door. If problem persists, contact your local Hobart Service Office. 2. See "Machine won't fill or won't fill high enough."
Dishes not clean.	<ol style="list-style-type: none"> 1. Strainers clogged causing inadequate water supply to pump - clean according to instructions. (See Cleaning.) 2. Obstruction in wash arm(s) or wash arms will not turn - clean according to instructions. (See Cleaning.) 3. Wash or rinse arms will not turn - check that they spin. 4. Detergent dispenser may be clogged. 5. Soil quantity - scrape dishes before cycle. 6. Improper rack loading - see Preparation in this manual. 7. Low water - check water pressure. 8. Water temperature too low - note wash temperature on display during WASH; should be above 120°F for chemical-sanitizing machines and above 150°F for other machines. 9. Incoming water supply turned off.
Spotting of silverware, glasses or dishes.	<ol style="list-style-type: none"> 1. Improperly loaded racks. 2. Water temperature too low. 3. Improper type or concentration of detergent - contact your local detergent representative. 4. Hard water - install a water softener; use a rinse agent. 5. Insufficient fill - check water pressure.
Chemicals not feeding.	<ol style="list-style-type: none"> 1. Low on chemicals - check levels. 2. Air leak at feeder hose connections - check for snugness. 3. Tubes kinked - check for smooth bends.
Food soils remain in dishwasher.	Follow daily cleaning instructions. (See Cleaning.)

Symptom	Possible Causes
Unexpected results on dishes.	<ol style="list-style-type: none"> 1. Etching - usually caused by any combination of high temperatures, soft water, soft glass or high alkaline washing solutions. 2. Tarnishing - avoid washing silver, silver plates and pewter in chemical-sanitizing machines. 3. Pitting - stainless steel may pit with lengthy contact of foods containing salt, fruit juices, vinegar, etc. Wash immediately. 4. Black or gray marks - may have been rubbed with aluminum. 5. Brown stains - may be due to high iron content in water supply. 6. Chipping - improper loading or ware is too delicate. 7. Fading of china patterns - usually due to high water temperature and strong detergent. Check that china is dishwasher compatible. 8. Wooden ware damage - avoid washing in dishwasher. 9. Rust on cast iron - seasoning is lost in dishwasher. Avoid dishwasher cleaning. 10. Plastic ware distortion - high temperatures. Check plastic ware's instructions.
Low-temperature readings.	<ol style="list-style-type: none"> 1. Low water supply temperature - make sure it meets the recommended limits. 2. Rapid cycle use - if incoming water temperature is low and cycle use rate is high, the hot water supply may be insufficient to meet the demand. 3. Heavy ware load cools wash water - do not overload racks. 4. Booster heater or sump heater set low - contact your local Hobart Service Office.
Machine will not fill or will not fill high enough. (Display shows E0, E2, E3 or E4. Machine will not run).	<ol style="list-style-type: none"> 1. Low water pressure - check for clogged hose strainer; ensure the site water pressure meets minimum flow pressures. 2. Make sure probes are clean. (See Cleaning.) 3. No water pressure - main water supply valves may not be working. 4. Drain valve open - turn machine OFF to drain machine, then ON. Repeat twice (This assists in clearing any drain valve obstructions.) Wait for machine to reach READY mode and press WASH. Slowly open door several seconds later and note water level. Close door; 30 seconds later, open door slowly and check that water level is the same as it was. If not, repeat the OFF-ON procedure. If problem persists, contact your local Hobart Service Office. 5. Delime machine.
Dishwasher makes noises after it drains when it is turned off.	Drain valve - this is normal; the drain valve operates several times to ensure it remains clear of obstructions.

Symptom	Possible Causes
Machine fills too high or leaks from door. (Display shows CL/Pr.)	<ol style="list-style-type: none"> 1. Machine not level - see LEVELING in this manual. 2. Fill solenoid valve leaking - turn the dishwasher OFF; if water continues to come in, contact your local Hobart Service Office. 3. Clean water level probes. (See Cleaning.)
Machine will not drain. (Display shows E5).	<ol style="list-style-type: none"> 1. Drain pipes restricted - check dishwasher drain line for kinks; ensure proper drain rate is allowed from plumbing. 2. Turn machine OFF. Wait several seconds and then turn back ON. Repeat this procedure twice if necessary. If problem persists, contact your local Hobart Service Office.
Some water occasionally drips out of rinse arms (H dishwashers only).	This is normal due to expansion of water being heated in the booster tank.
Machine displays E6.	Contact your local Hobart Service Office.
Machine lights up wrench and flashes P1, P2 or P3.	Contact your local Hobart Service Office.
Machine lights up wrench and chemical icon.	Refer to Priming Chemical Pumps.

NOTES

NOTES

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH
ITEM PAGE#

ITEM NUMBER- 24 QUANTITY- 001

DESCRIPTION- DISPOSER

MANUFACTURER- SALVAJOR COMPANY/PRIDE

MODEL NUMBER- 200-CA-ARSS

SERVICES

ELECTRIC-	208	VOLTS	1	PHASE		CYCLE
		KW	(MOTORS)		HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SALVAJOR DISPOSER MODEL#200-CA-ARSS WITH
15" DIAMETER CONE. VACUUM BREAKER,
FACTORY MOUNTED SOLENOID VALVE, TIME
RELAY, FACTORY MOUNTED FLOW CONTROL
VALVE. WATER SAVER PACKAGE AND POSITIVE
FLUSH. LINE DISCONNECT. DRAIN SIZE CON-
VERTED IN FIELD FROM 2" TO 3". 208/1 PH.
ARSS-TR CONTROL PANEL. ADJUSTABLE LEG
SUPPORT.

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

SEE ITEM # 24

ITEM NUMBER- 25 QUANTITY- 001
DESCRIPTION- DISPOSER CONTROL IN ITEM #24
MANUFACTURER- SALVAJDR COMPANY/PRIDE
MODEL NUMBER-

SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SPECIFIED AS PART OF ITEM #24 DISPOSER.

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 26 QUANTITY- 000

DESCRIPTION- SPARE NUMBER

MANUFACTURER-

MODEL NUMBER-

SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 27 QUANTITY- 001
DESCRIPTION- MICROWAVE OVEN NIC/BY OWNER
MANUFACTURER-
MODEL NUMBER-
SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 28 QUANTITY- 001

NO OPERATION AND
MAINTENANCE MANUAL AVAILABLE

DESCRIPTION- WALL CABINET

MANUFACTURER- SERVCO - FABRICATION

MODEL NUMBER-

SERVICES

ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 29 QUANTITY- 001

DESCRIPTION- ICE MACHINE

MANUFACTURER- SCOTSMAN/REFRIG. SUPPLIES

MODEL NUMBER- SCE170A-1

SERVICES

ELECTRIC-	120	VOLTS	1	PHASE	CYCLE
		KW	(MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SCOTSMAN ICE MACHINE, MODEL #SCE70A-1
WITH STANDARD FINISH. AIR-COOLED, 120 V,
1 PHASE. START UP AND ADJUST. PRODUCTION
PER 24 HOUR PERIOD APPROXIMATELY 165
POUNDS OF CUBE ICE BASED ON 70 DEGREE
AMBIENT AIR AND 50 DEGREE WATER TEMPERA-
TURE. R404A REFRIGERANT. FIVE (5) YEAR
COMPUTER, COMPRESSOR AND EVAPORATOR
WARRANTIES. CORDSET ATTACHED.

Introduction

To the owner or user: This service manual is intended to provide you, and the maintenance or service technician, with the information needed to install, start up, clean, maintain and repair this product.

The SCE170 is an ice machine that produces cubed ice on a grid type freezing surface. The cubes form into a cluster that falls into the ice storage bin where they break up into individual and small groups of cubes.

The SCE170 automatically maintains the level of ice by turning on when the ice level falls, and switches off when the bin is full.

This unit is serviceable in place; the ice storage bin and hood may be removed from the chassis to allow service access without removing the ice machine from its installed position. The refrigeration system uses HP62 as the refrigerant.

Table of Contents

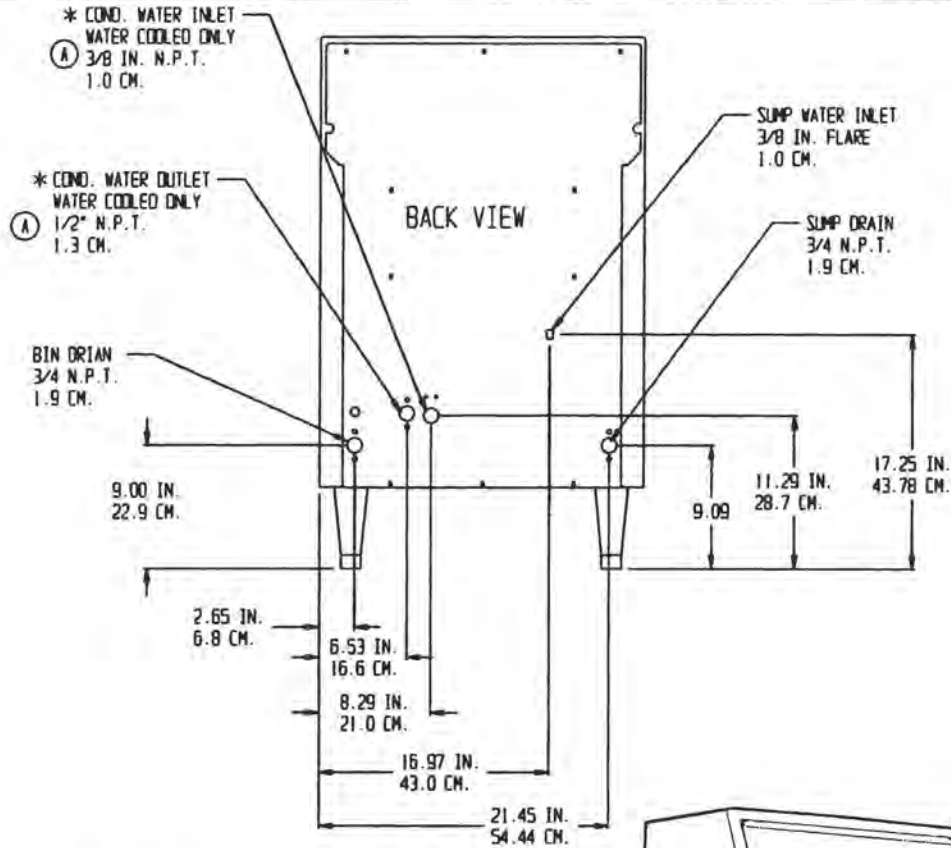
Specifications	2
For The Installer: Environmental Limitations	3
Installation	4
Removal of the Cabinet	7
Component Location	8
Component Description	9
Initial Start Up	10
Electrical Sequence	12
Maintenance and Cleaning	13
Sanitizing and Water System Cleaning	14
Maintenance and Cleaning	15
Water Schematic:	16
Refrigeration Schematic:	17
Technical Characteristics	18
Service Diagnosis	19
Removal and Replacement: Cube Size Control	22
Removal and Replacement: Water Pump	23
Removal and Replacement: Float Valve	24
Removal and Replacement: Curtain & Bin Control	25
Removal and Replacement: Purge Valve	26
Refrigeration System Service: HP62	28

Parts lists and wiring diagrams are located in the center of this manual, printed on yellow paper.

This manual was printed on recycled paper.

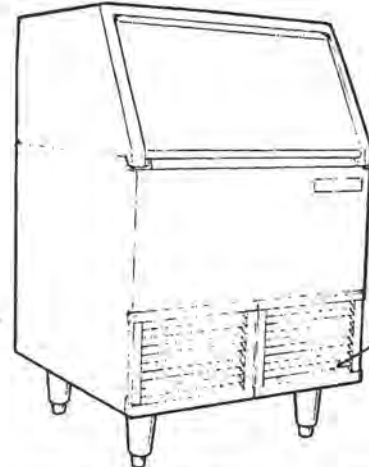
SCE170

Specifications



The unit is equipped with an electrical power cord, but should only be plugged into a circuit dedicated to the ice machine.

**THE NAMEPLATE IS LOCATED ON THE BACK PANEL.
A SERIAL NUMBER PLATE IS LOCATED BEHIND THE RIGHT FRONT PANEL, ON THE BASE IN FRONT OF THE CONTROL BOX**



Serial Number Plate (Behind Grill)

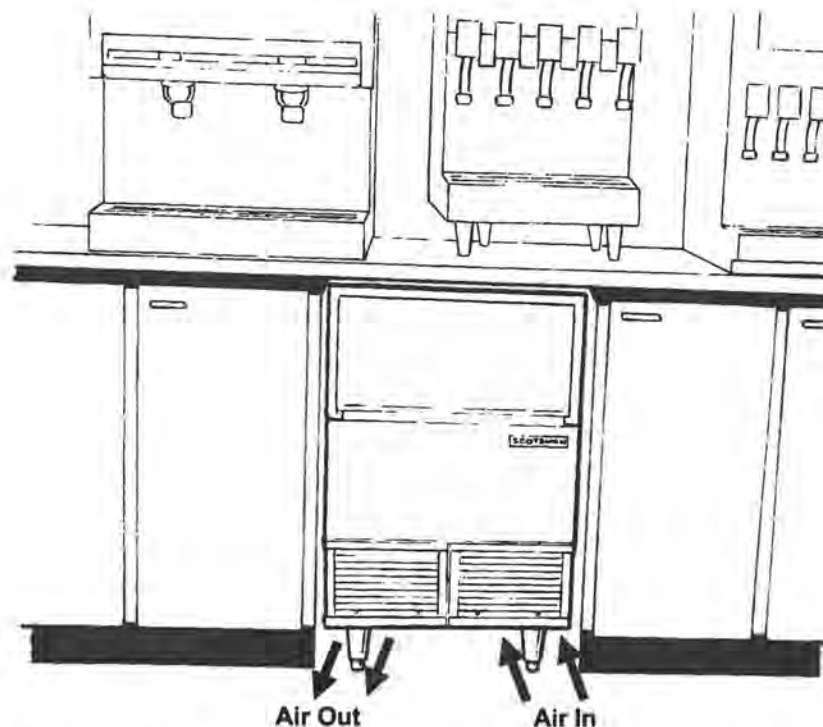
Model Number	Dimensions (w/o legs) H" x W" x D"	Basic Electrical	Ice Type	Condenser Type	Total Load Amps	Total Wattage	Refrigerant HP62 (R-404a)
SCE170A-1A	33 x 24 ¹ / ₄ x 24	115/60/1	"Half-Dice" Cube	Air	10		see page 18
SCE170A-1C	SAME	SAME	SAME	Air	10		see page 18
SCE170W-1A	SAME	SAME	SAME	Water	10		see page 18
SCE170W-1C	SAME	SAME	SAME	Water	10		see page 18
SCE170A-6C	same	230/50/1	SAME	Air	5	1150	see page 18
SCE170W-6C	same	230/50/1	SAME	Water	5	1150	see page 18

Note: A scoop and legs are included. Power Cord Supplied.

For The Installer: Environmental Limitations

The ice machine must be installed indoors in a controlled environment.

	Minimum	Maximum
Air Temp	50 ⁰ F.	100 ⁰ F.
Water Temp	40 ⁰ F.	100 ⁰ F.
Water Pressure	20 PSI	80 PSI
Voltage	103.5	126.5



Operating the ice machine outside of the above limitations, or outdoors, is potentially damaging to the machine, and it is misuse of the machine. This may void the warranty.

Scotsman Ice Systems are designed and manufactured with the highest regard for safety and performance. They meet or exceed the standards of UL, NSF, and CSA.

Scotsman assumes no liability or responsibility of any kind for products manufactured by Scotsman that have been altered in any way, including the use of any part and/or other components not specifically approved by Scotsman.

Scotsman reserves the right to make design changes and/or improvements at any time.

Specifications and design are subject to change without notice.

Airflow on air cooled models is:

- Intake through the right front grill.
- Exhaust through the left front grill.

Do not install where this air flow is obstructed.

The SCE170 has a removable cabinet. When installed, the machine should have some extra clearance ($\frac{1}{8}$ "") on the left and right sides so that the cabinet may be easily removed when the machine is in place.

SCE170

Installation

Water

The water supply for this ice machine has been in contact with many materials since it fell from the sky as rain. All rain is slightly acidic, and tends to dissolve the materials it comes in contact with.

During water's journey to the ice machine, it has flowed over and through the ground, been picked up by a municipal or private pump, forced through a series of pipes of differing construction and may have been treated by the municipality providing the water.

The water supplied to this ice machine will then contain a variety of substances that will likely show up as solids during the ice making process. These solids are similar to those found when water is boiled out of a saucepan. Only the water boils away, and the minerals that were in the water solidify in the pan. During ice making only the water is frozen into ice, the minerals stay behind in the reservoir. This machine pumps out the water in the reservoir every cycle to minimize the amount of minerals in the water system, but after time the minerals will appear and have to be dissolved by ice machine cleaner, then flushed away during the cleaning process.

An ice machine is a food manufacturing plant; it takes a raw material, in this case water, and transforms it into a food product, ice. The purity of the water is very important in obtaining pure ice and in maximizing product life.

The water to the ice machine should be filtered. Water filters vary greatly in ability and function. Install one that filters out suspended solids to a dimension of 5 microns or less. The finer the filter the better, but finer filters may plug-up sooner than course ones. It may be necessary to add a course filter ahead of the fine filter to prolong filter life.

Have the water tested. Acidic water or alkaline water will both cause corrosion. Dissolved solids cannot be filtered out. Check with a water treatment specialist regarding testing, treatment and filters.

This ice machine may be installed in the open or under a counter. No clearance is required at the sides or top beyond what's needed to place the cabinet into position. Air cooled models blow air in and out through the grills at the front. Space is required for utility connections at the back.

The ice machine is not designed for outdoor use. It must be installed indoors, in a controlled environment. The air and water temperatures must not exceed rated limits.

Electrical power is supplied through a cord connected to the unit. All local codes must be followed.

Pre-installation:

1. Inspect the place where the ice machine is to be installed. Check for:

- space for the cabinet,
- water supply,
- drain availability
- and electrical power supply.

No extension cords are allowed. The building drain inlet must be lower than the drain outlets at the back of the ice machine. The water supply must have a hand shut off valve accessible when the unit is installed.

2. Determine the method of installation, is the machine to be installed under the counter? Is the drain in the floor under the machine? Is the water inlet valve accessible?

Installation

For The Plumber

1. Connect cold potable water to the $\frac{3}{8}$ " male flare at the top back of the cabinet. A water filter is recommended. Flush the water line prior to connecting to the ice machine.

If water cooled, connect a separate water inlet line to the water cooled condenser inlet fitting. It should also have a hand shut off valve.

A loop of copper tubing may be used between the ice machine and the water supply. This will allow the ice machine to be pulled out from its installed location without disconnecting the water line. No back-flow preventer should be needed in the inlet potable water line because provision for that is incorporated in this N.S.F. listed product (the float seat is above the reservoir wall and cannot siphon).

2. Connect a drain tube to each drain. The drain tubes from these connections must be run separately. There are two connections at the back of the cabinet, one is the bin drain and the other is the purge drain. Both are $\frac{3}{4}$ " F.P.T. brass fittings.

Drain tube material must be rigid and meet local code.

Traps in the bin drain line without vents ahead of them will cause poor draining.

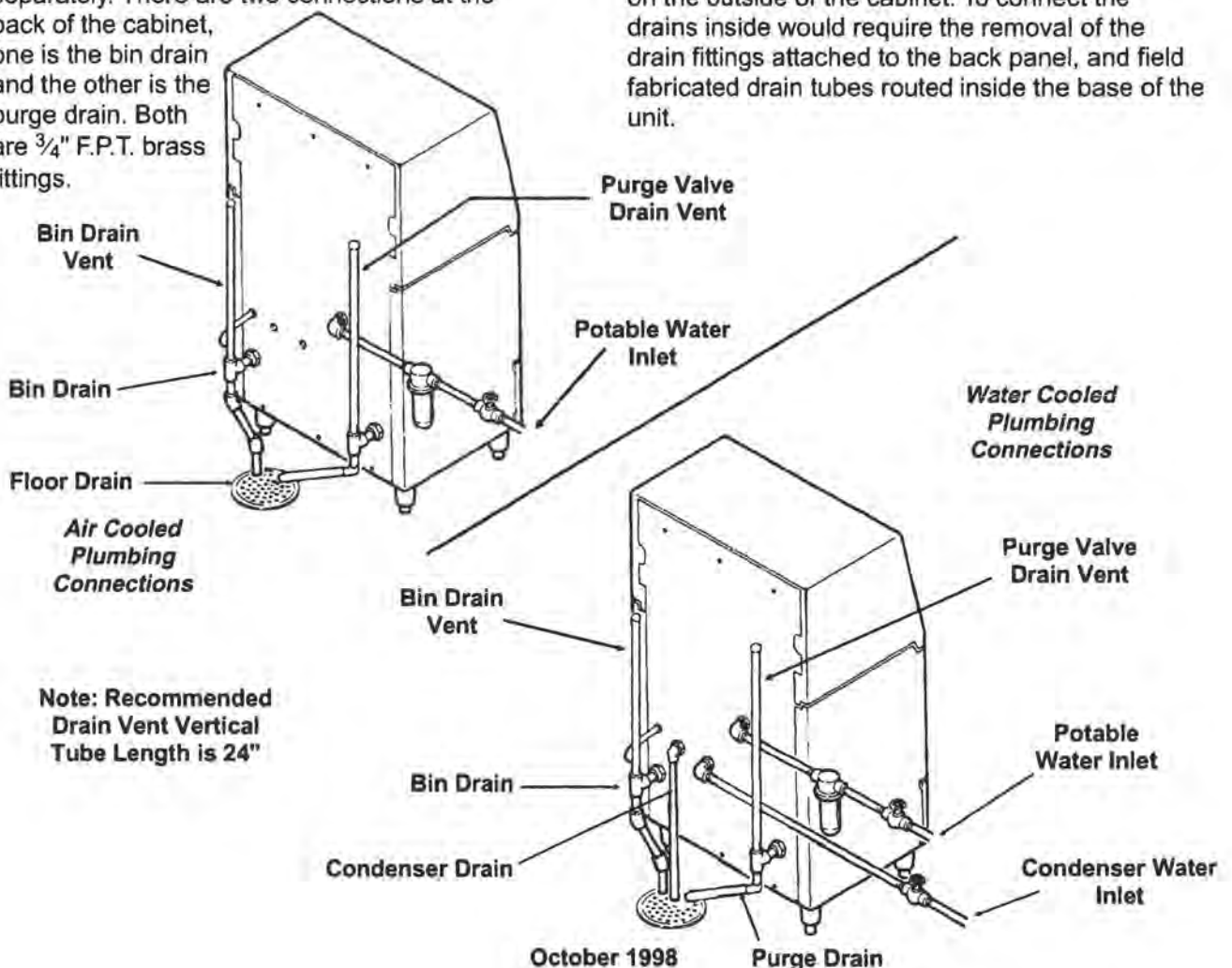
The bin drain must be vented if there is a long horizontal run (5' or more). The purge drain must also be vented. All drains are gravity, and must have a minimum fall of 1/4" per foot of horizontal run. The water cooled condenser drain should not be vented, and is routed separately.

Maintain the air gap required by local code between the end of the drain tubes and the building drain receptacle.

Note: Drain tubing should be insulated to prevent condensation from forming on the tubing.

CONFORM TO ALL LOCAL CODES

Note: The unit is designed for drain connections on the outside of the cabinet. To connect the drains inside would require the removal of the drain fittings attached to the back panel, and field fabricated drain tubes routed inside the base of the unit.



SCE170

Installation

For The Electrician

This is a cord-connected unit, and must be on a separate 115 volt AC 60 cycle single phase power supply. The maximum fuse size for this circuit should be 15 amps, per the nameplate use fuses, or HACR circuit breakers.

Follow All Local Codes - This Unit Must Be Grounded. Do not use extension cords and do not disable or by-pass ground prong on electrical plug.

After Utility Connections:

1. Level the cabinet, use the leg levelers on the end of the legs to adjust the cabinet height. (Legs should have been installed when the unit was unpacked).
2. Wash out the bin and hood. If desired, the interior of the bin could be sanitized.
3. Locate the scoop, wash it and have it available for use when needed.

Final Check List

1. Is the ice maker cabinet in a room where ambient temperatures are within the minimum and maximum temperatures specified?
2. Has the water supply been connected?
3. Is the water pressure adequate?
4. Have the water connections been checked for water leaks?
5. Have the drain connections been made?
6. Have the drain connections been checked for leaks?
7. Is the cabinet level?
8. Is the ice machine plugged into a 115 volt electrical power supply and is the ice machine the only load on that circuit?
9. Has all of the shipping material been removed from the inside of the cabinet?
10. Has the bin and cabinet been wiped clean and sanitized?
11. Has the Customer Evaluation & Warranty Registration form been filled out? Check for correct model and serial numbers from the nameplate, then mail the completed form to Scotsman.
12. Has the owner/user been given the name and telephone number of the authorized Scotsman Service Agency serving that location?
13. To start up machine, follow the directions on page 10. For more information on the unit, turn to the next page.

Removal of the Cabinet

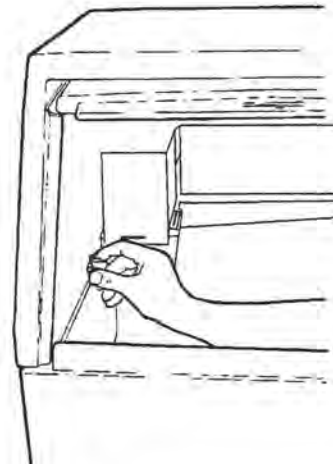
One of the most useful features of this ice machine is the ability to remove the cabinet from the ice machine without removing the ice machine from its installed position.

To Remove:

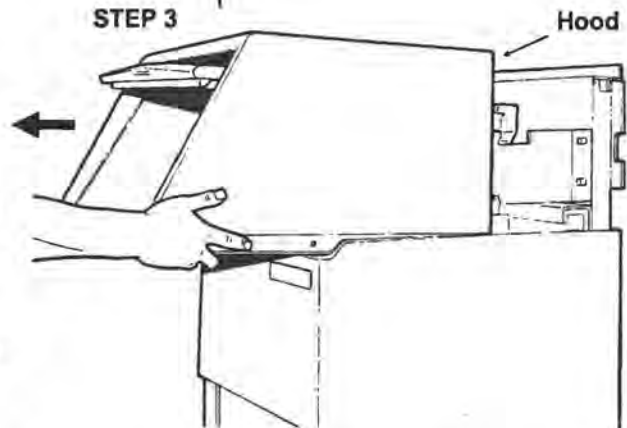
1. Switch the master switch to OFF. Be certain the ice machine has been switched off.
2. Open the bin door and unscrew the knobs at the left and right inside of the ice storage bin. Unscrew the knobs all the way out.
3. Pull the hood and door assembly straight out until it can be lifted up. Caution: the door will be free to come out the back of the hood when removed from the cabinet base.
4. To remove the cabinet base the hood must be removed first.
5. Remove 4 screws and the two grills at the front of the base.
6. In the area exposed when the grills are removed are two knobs similar to those removed in step 2. Unscrew and remove the two knobs.
7. Locate bin drain. Loosen hose clamp holding drain tube to fitting and pull the drain tube off of the fitting.
8. Lift up the front of the base and rotate the base up and off of the ice machine.

The machine is now exposed for service.

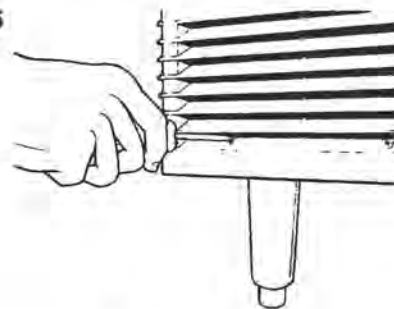
STEP 2



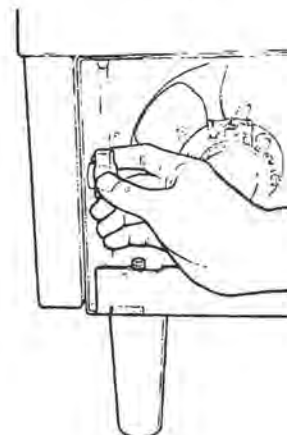
STEP 3



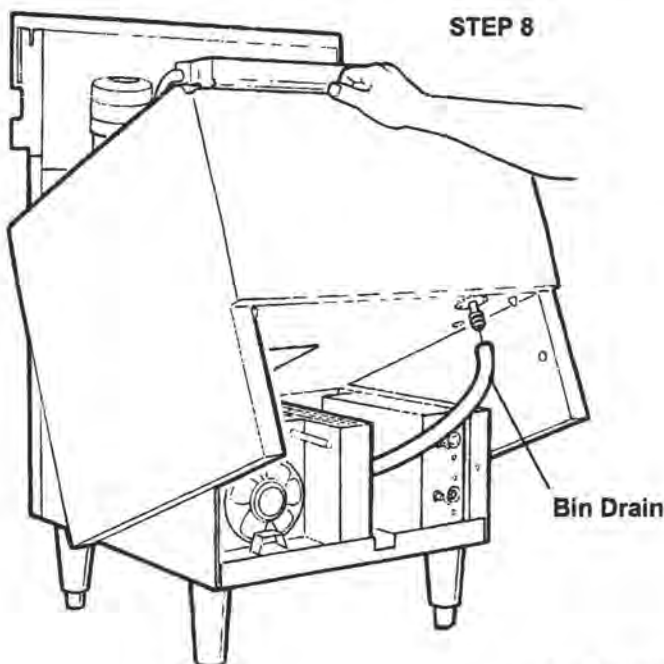
STEP 5



STEP 6



STEP 8



SCE170

Component Location

The ice machine is designed for front service. Many components are serviceable from the front without removing the cabinet. With the cabinet removed, nearly all components are serviceable.

In the bin area can be found:

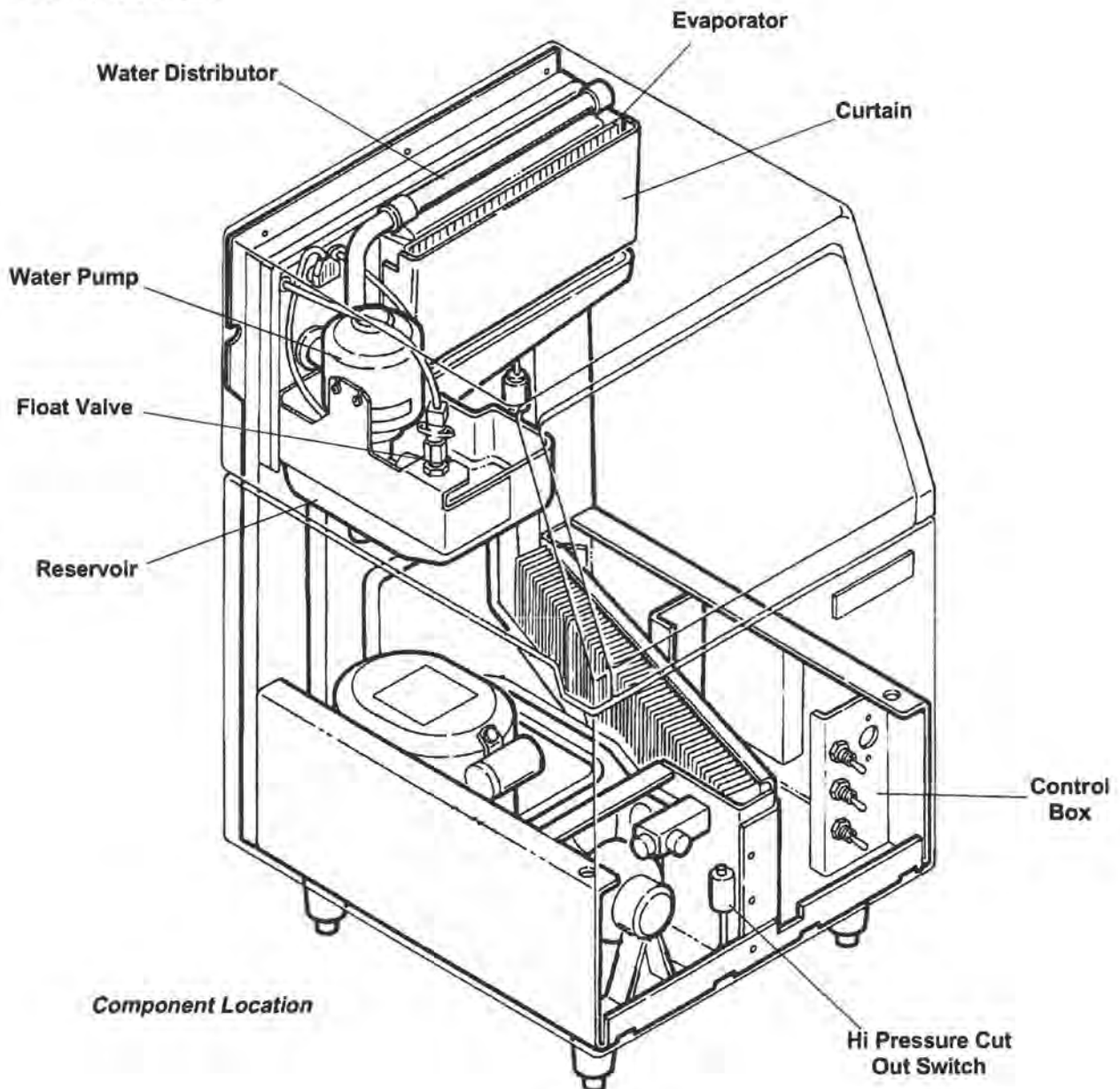
- Water pump
- Float valve
- Reservoir
- Evaporator
- Curtain
- Water distributor

Behind the right front grill on the front edge of the control box:

- Control box with cube size control adjustment
- ON/OFF/CLEAN switch
- Manual Harvest switch
- Purge switch

Inside the control box is control system for the ice machine.

When the bin is removed, the condensing unit is visible.



Component Description

Water Pump

During the freeze cycle, the water pump moves the water from the reservoir to the water distributor at the top of the evaporator. During the harvest cycle, the water pump moves water from the reservoir to the purge valve and down the drain.

Float

The float valve controls the water flow into the reservoir. When the water level drops in the reservoir, the float also drops and opens the valve. Note: water flow to this ice machine is controlled by a flow control within the float valve.

Shut Off Valve

There is a water shut off valve located just above the float valve. Pushing the valve button controls the water flow to the float valve.

Reservoir

The place where the water pump picks up water to pump, and a return trough for water flowing from the evaporator.

Curtain

There is a curtain to cover the ice making side of the evaporator. The curtain keeps water from flowing into the ice storage bin, and, through the curtain sensor, controls the harvest time and on/off operation of the ice machine. There are two indicator lights for the curtain on the control board. Both lights will be ON when the curtain is fully closed.

Note: If the unit is in the Freeze Cycle, the Curtain can be moved/removed without disturbing the operation of the machine.

Water Distributor

The water distributor is an assembly of two tubes (one inside the other) that evenly distributes water over the evaporator.

Purge Valve

The purge valve opens during the harvest cycle, allowing the water pump to pump reservoir water down the drain. This dilutes the reservoir's concentration of minerals that remain after water is made into ice.

High Pressure Cut Out

This is a switch that opens to stop the ice machine when the internal refrigeration pressures become too high (over 450 PSIG). It is a manual reset on all water cooled machines and all air cooled machines built prior to October 1998, after that the air cooled models use an automatic reset switch.

ON/OFF/CLEAN Switch

This switch is the main manual control for the ice machine.

Purge Switch

This switch operates the purge valve ONLY when the ON/OFF/CLEAN switch is in the Clean position. Used when cleaning the ice machine.

Manual Harvest Switch

This switch puts the machine into the harvest cycle, used when cleaning or servicing the machine.

Cube Size Control

The cube size control is a reverse-acting thermostat that controls the start of the timed freeze cycle. It must be set properly to provide the correct size cube bridge. When it is Closed, an indicator light on the control board will be ON.

Strainer

There is a strainer in the inlet water line to keep large particles that may be in the water supply from plugging up the float valve. The strainer may be cleaned if it becomes restricted.

Hot Gas Valve

The hot gas valve is a refrigeration component used to by-pass the condenser and force warm refrigerant into the evaporator during the harvest cycle.

Evaporator

Where the ice is formed. It is a vertical, 5 row by 26 column, all copper, nickel-plated evaporator.

The outside edges of the evaporator are enclosed in plastic to keep water out.

Thermostatic Expansion Valve

The thermostatic expansion valve is used to meter liquid refrigerant into the evaporator, adjusting the flow of refrigerant as required to make ice.

SCE170

Initial Start Up

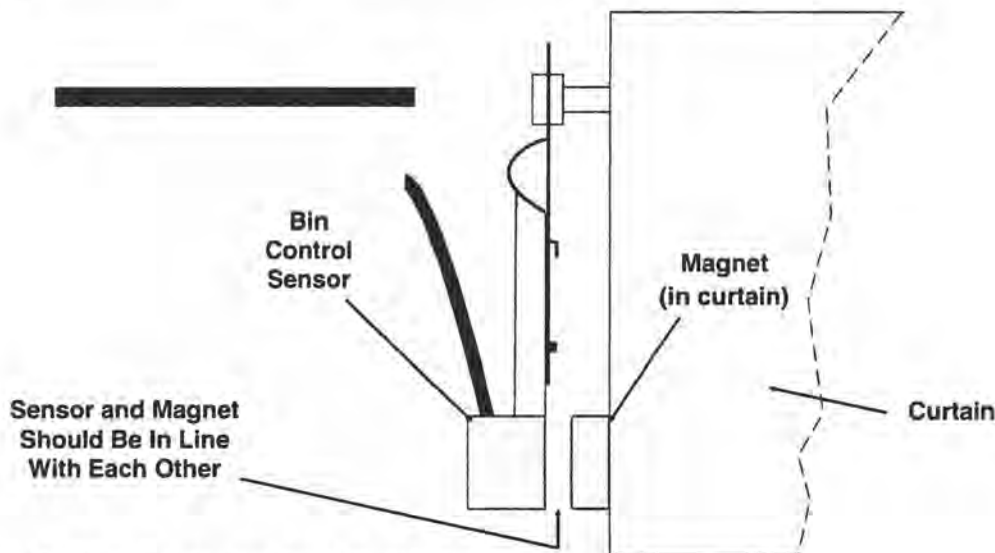
After the final check list has been gone through, the ice machine may be started up.

1. Open the bin door, open the water shut off valve and watch the reservoir fill with water. The water level should be about 1 5/8" from the top front edge of the reservoir when the valve shuts off. Adjust water level only if more than 1/4" off normal.
2. Pull open and release the curtain to check that it moves freely and closes completely. Check that bin control sensor is in line with the magnet in the curtain. Reposition curtain and/or sensor to their normal positions to bring these two components in line.

8. The water temperature in the reservoir will soon be 32°F, and ice should begin to form on the evaporator. Note: In most cases some slush will form in the reservoir. This is temporary and normal.

9. Allow the ice machine to operate for about 15-20 minutes. The ice should be fully formed and should be harvested within a few minutes.

Note: The machine may make a "cracking" noise a few minutes before harvest. This is the normal sound of the ice expanding.



3. Remove two screws and the right grill.
4. Switch the ON/OFF/CLEAN switch to CLEAN.
5. Move the Purge Switch, check that the machine pumps water out thru the purge drain. If no water flows out, correct drain and/or check valve.
6. Switch the ON/OFF/CLEAN switch to ON.
7. On air cooled models the fan motor will begin to turn, and warm air will be discharged from the left front of the ice machine.
On water cooled models warm water will begin to flow from the condenser drain.

Initial Start Up

10. When the cubes are about the correct size, the unit will automatically go into a "harvest" cycle. The purge and hot gas valves will open and on air cooled models, the fan will stop. **To operate properly, the machine must harvest a complete sheet of cubes. The falling ice sheet must open the curtain and the curtain must re-close before another freeze cycle can begin.**

11. After harvest, check the thickness of the ice.

- The connecting ice bridge between cubes should be about $\frac{1}{8}$ - $\frac{3}{16}$ inch thick.
- The "dimple" in most of the cubes must **not** be deeper than $\frac{1}{16}$ inch.

If needed, adjust the bridge thickness by rotating the adjustment screw of the cube size control. Rotate the adjustment screw $\frac{1}{8}$ turn at a time. Turn it clockwise to make the bridge thicker, and counterclockwise to make the bridge thinner.

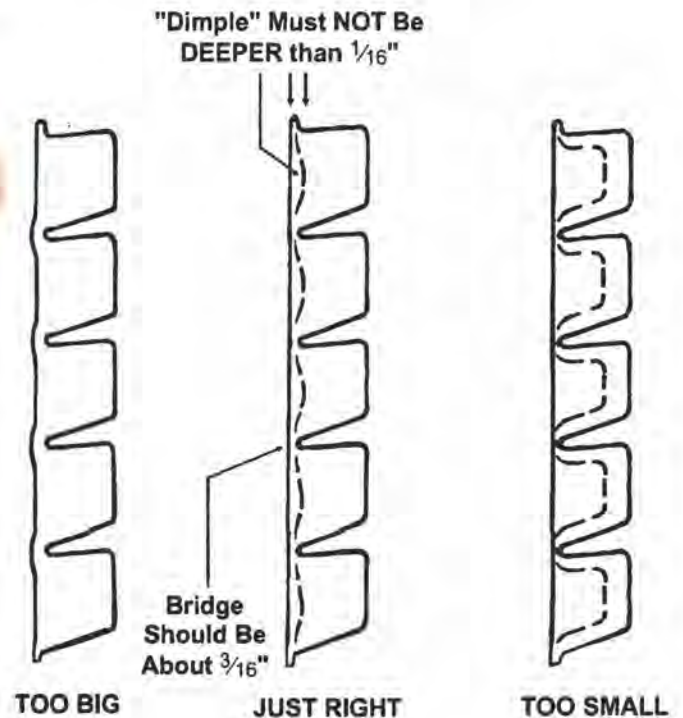
Although the machine is not designed to harvest individual cubes, the ice should break up into smaller groups of cubes in the bin. Bridge thickness may be adjusted thinner to make ice break-up easier, but the ice **must** fall as a sheet.

Note: Tapping a recently harvested ice sheet with the back of a scoop should break it up.

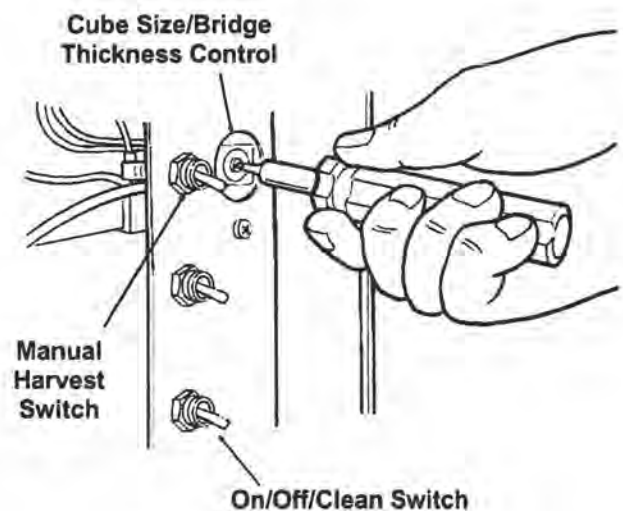
12. Check the operation of the bin control circuit: push the manual harvest switch down, release it and then hold the curtain open. This simulates the bin being full of ice and after a few seconds with the curtain open the ice machine should switch itself off. Release the curtain and the machine will restart.

13. Replace the grill and close the bin door. The ice machine is now ready for automatic operation.

Cube Size or Bridge Thickness, Side View



Note: Batch Weight Should Be Between 1.6 and 1.8 lb.



Adjustment of Cube Size (Bridge Thickness)

SCE170

Electrical Sequence

This describes the sequence through a complete cycle.

Freeze Cycle (curtain closed):

When the ON/OFF/CLEAN switch is at the ON position, power is connected to the primary of the transformer, which supplies power to the:

- Control board and curtain sensor. If the curtain is closed, the control board connects power to:
- The compressor contactor coil. When the contactor is energized, it connects power to the compressor.
- The control board also operates the water pump and, if air cooled, the fan motor.

Timed Freeze:

After some ice has built up on the evaporator and the suction line temperature has fallen, the cube size thermostat contacts close, resulting in:

1. The Timed Freeze indicator light on the control board glowing.
2. Power being connected to the freeze timer (in the control board). After 4 minutes this internal timer starts the harvest cycle by shutting power off to the fan motor (if air cooled) and connecting power to the:
 - Hot gas valve coil, opening the valve.
 - Purge valve coil, opening the valve.

Note: Both curtain indicator lights glow when the curtain is completely closed. Timed freeze indicator light glows when cube size control closes.

Harvest/Shut Off:

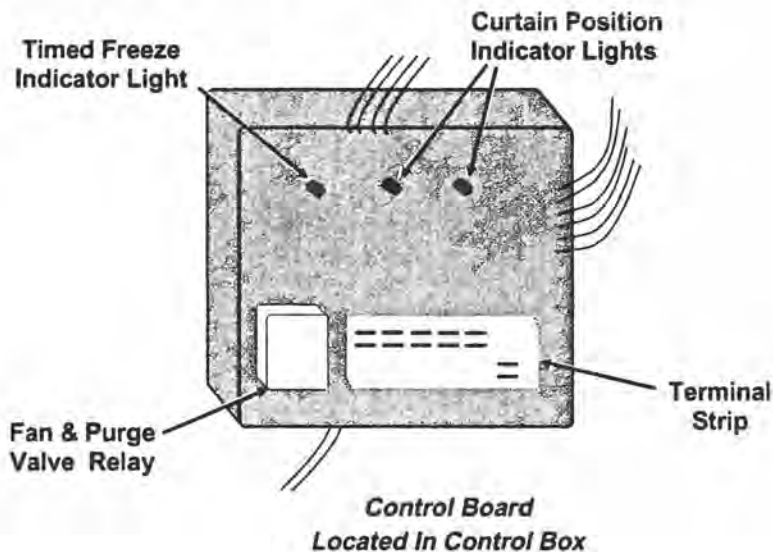
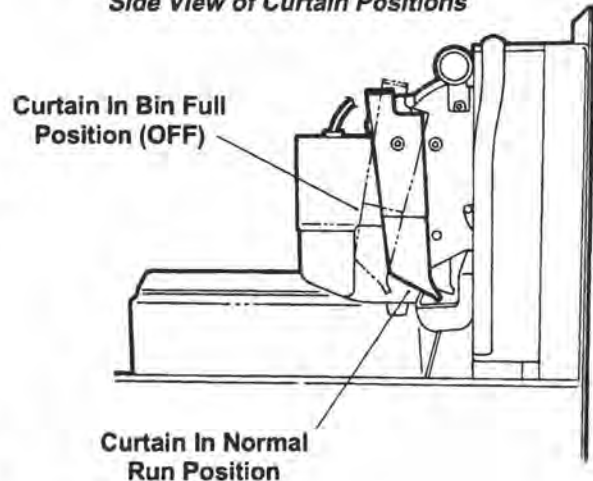
The machine stays in the harvest cycle until the curtain is opened by the passage of the ice sheet, or until 7 minutes have passed. If after 7 minutes of harvest time the curtain has not opened, the control board switches the machine back into the freeze cycle.

After the curtain has opened, the control board keeps the machine in the harvest cycle for 7 additional seconds.

If the curtain re-closes, the machine goes back into another freeze cycle.

If the curtain does not re-close, the bin control board opens the circuits to all components except the control circuit, stopping ice making.

Side View of Curtain Positions



Maintenance and Cleaning

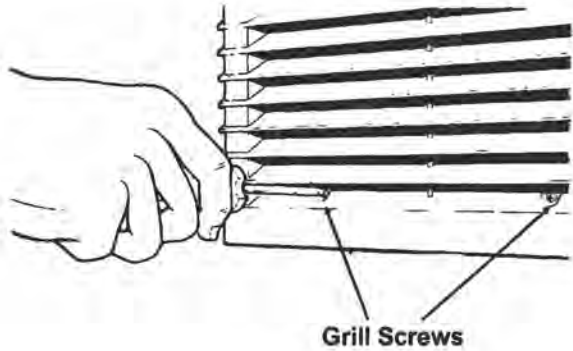
Cleaning Schedule:

- Scrub the door and frame edges once a week with soap and water.
- Sanitize the bin interior once a month.
- Clean the water system and air cooled condenser a minimum of twice per year. If in an area of high mineral concentration in the water supply, clean water system 4 times a year.

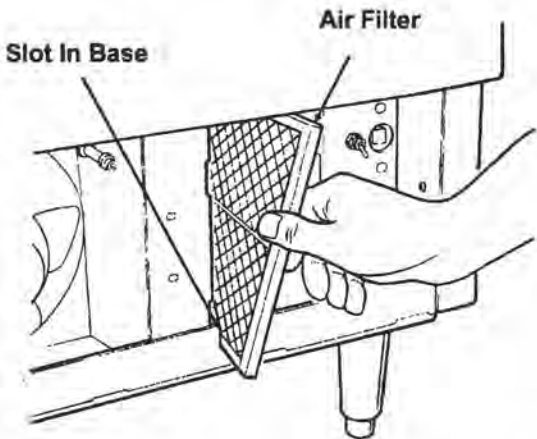
This ice machine will perform at its best when kept clean. There are two areas to keep clean: The water system including the water reservoir, distributor tube and evaporator surface; and the air cooled condenser filter and the condenser itself.

Air Filter (air cooled only):

1. Remove the grills on the front of the unit.
2. Remove two screws and the bracket holding the filter to the condenser.



3. Pull the filter forward and twist it slightly to pull it through the slot in the front base of the ice machine.



4. Wash the surface of the filter off with cold water, or, if torn or so dirty it can't be cleaned, replace with a new filter.
5. Return the filter to its installed position.
6. Replace the bracket removed in step 2.
7. Replace the grills. Do not operate the unit without the filter in place.

Note: If the unit has been operated without the filter in place, the fins of the condenser will become fouled with dirt, and must be cleaned. Scotsman recommends that only the surface of the condenser be cleaned with the bin in place. A vacuum cleaner with a soft brush attachment will extract most loose dust stuck to the surface of the condenser fins. If there is any doubt about dirt inside the fins of the condenser, the cabinet should be removed and a qualified service agent should clean the condenser.

Water cooled units:

The water cooled condenser may, over time and under certain water conditions, become internally restricted by minerals. These will have to be dissolved by acid or the condenser replaced. Only a qualified service agent should attempt this type of service.

SCE170

Sanitizing and Water System Cleaning

Cleaning Water System:

The water system is cleaned by pumping a mixture of water and **nickel safe type ice machine cleaner** through the water distributor, over the evaporator and back to the reservoir.

1. Open the door and empty the bin of ice.
2. Remove the right front grill.
3. Locate the Harvest switch; activate harvest cycle for 2 minutes or until ice falls from the evaporator.
4. Locate and move the ON/OFF/CLEAN switch to **CLEAN**.
5. Open and close the curtain to release any cubes.
6. Mix a solution of 1 quart of warm (95°F. - 115°F.) water and 1 ounce of **nickel safe ice machine cleaner**, such as Scotsman Nickel-Safe.*

Ice Machine Cleaner contains acids. These compounds may cause burns.

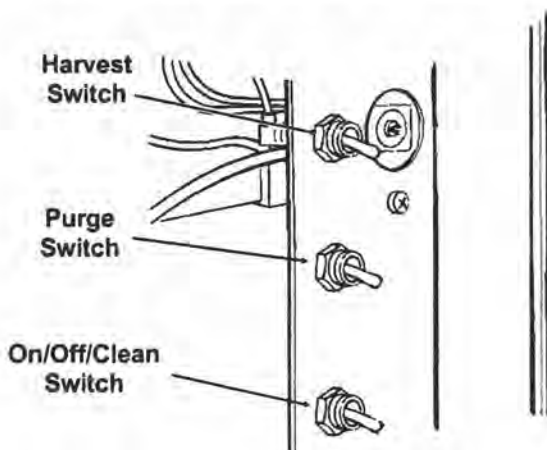
If swallowed, DO NOT induce vomiting. Give large amounts of water or milk. Call Physician immediately. In case of external contact, flush with water.

KEEP OUT OF THE REACH OF CHILDREN.

⚠ WARNING

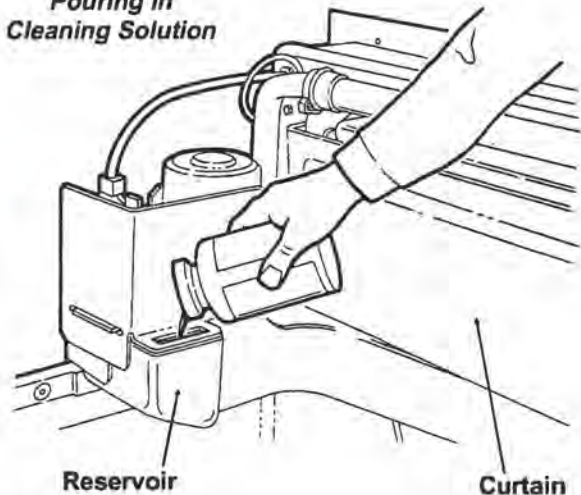


7. Locate the purge switch, push it to ON and hold it ON until the reservoir is nearly empty.



8. Immediately pour the cleaning solution into the reservoir and allow it to circulate through the water system for 20 minutes.

Pouring In Cleaning Solution



9. Either A) Move the purge switch ON and hold it until the reservoir is nearly empty; or B) Remove the drain plug, drain the reservoir & replace the plug.

10. Open the curtain and check the condition of the evaporator surface, if it appears clean proceed to the next step. If mineral scale is still present, repeat steps 6-9 one more time.

Note: The ice making portion of the water system should be sanitized after cleaning by repeating steps 7-9, except substitute an approved sanitizing solution (such as a mixture of 1 oz. of household bleach to 2 gallons of warm {95°F. - 115°F.} water) for the cleaning solution.

Note: Sanitizer need only circulate water system for 2 minutes, or the time on the sanitizer instructions. Retain the balance of the sanitizer solution for sanitizing the bin interior.

11. After the reservoir refills, move the purge switch up until the reservoir is nearly empty. Allow the reservoir to refill. Repeat 4 times.
12. Move the ON/OFF/CLEAN switch to ON and replace the grill.
13. Discard the next batch of cubes.
14. The unit is now ready for automatic operation or sanitizing of the ice storage bin.

* Scotsman Nickel Safe Cleaner is available by ordering part number 19-0636-06 (8 oz bottle).

Sanitizing and Cleaning

Water Distributor:

Note: The water distributor may need to be cleaned separately.

1. Remove right front grill.
2. Switch master switch to OFF.
3. Open bin door.
4. Locate hood fasteners at the left and right inside walls of the hood, and remove the hood.
5. Remove the curtain.
6. Locate wing-nuts at the top of the water distributor and remove them.
7. Remove inlet hose from water distributor.
8. Pull water distributor forward and out of the ice machine.

The distributor may be pulled apart and any mineral accumulation washed out. Sanitize the water distributor and curtain after cleaning. Reverse the above steps to reassemble.

The storage bin must be cleaned regularly to maintain a sanitary environment. Once a week cleaning of the door and door frame with soap and water, a hot water rinse and an air dry is a basic procedure. Scale that may form on the plastic liner can be removed by scrubbing the surface with a mixture of Scotsman Ice Machine Cleaner and hot water. Remove any scale prior to cleaning.

To Remove Scale:

1. Mix a cleaning solution of 4 ounces of Ice Machine Cleaner to 4 pints of hot (95⁰F.-110⁰F.) water.
2. Using rubber gloves, dip a nylon scouring pad into the cleaning solution and scrub the scale off the liner.
3. After the scale has been removed, rinse all surfaces inside the bin with clean, potable water.

To Sanitize The Bin Interior:

The hood must be removed from the storage bin so that the joint between the two can be cleaned and sanitized.

To remove the hood:

1. Open the storage bin door and locate the knobs at the right and left inside wall.
2. Unscrew and remove the two knobs.
3. Pull the hood assembly and door straight out from the ice machine. Note: the door may be then be removed from the back of the hood.

Use an approved sanitizer and follow the directions and warnings of that sanitizer or use the following instructions for use of household bleach, if it meets local codes:

1. Mix sanitizing solution of 1 ounce of household bleach to 2 gallons of water.
2. Using clean rubber gloves and a clean cloth, wipe all interior surfaces of ice storage bin, hood and door with sanitizing solution. Be sure and wipe the joint between the hood and bin with the sanitizing solution. Use a clean brush or spray bottle to thoroughly swab/spray all interior surfaces with the sanitizing solution.
3. Reassemble and allow to air dry.

Stainless Steel Components Inside Bin

The stainless steel parts in the bin also require periodic cleaning. Chemicals in the water supply, such as chlorine, cause brown stains to appear on the surface of the stainless steel parts.

1. General Cleaning - staining is usually removed by washing the parts with ordinary cleaning powder such as Bon-Ami or Copper-Glo and water. After cleaning, rinse with clear water.
2. Water treatment. The chlorine enters the machine from the municipal water supply. It can be removed from the water supply by using a charcoal or activated carbon water filter to treat the water to the ice machine. If staining is severe, filters of this type are recommended.

Exterior Cabinet Cleaning:

The exterior cabinet may be cleaned by scrubbing with soap and water. Do not use cleaners containing petroleum products.

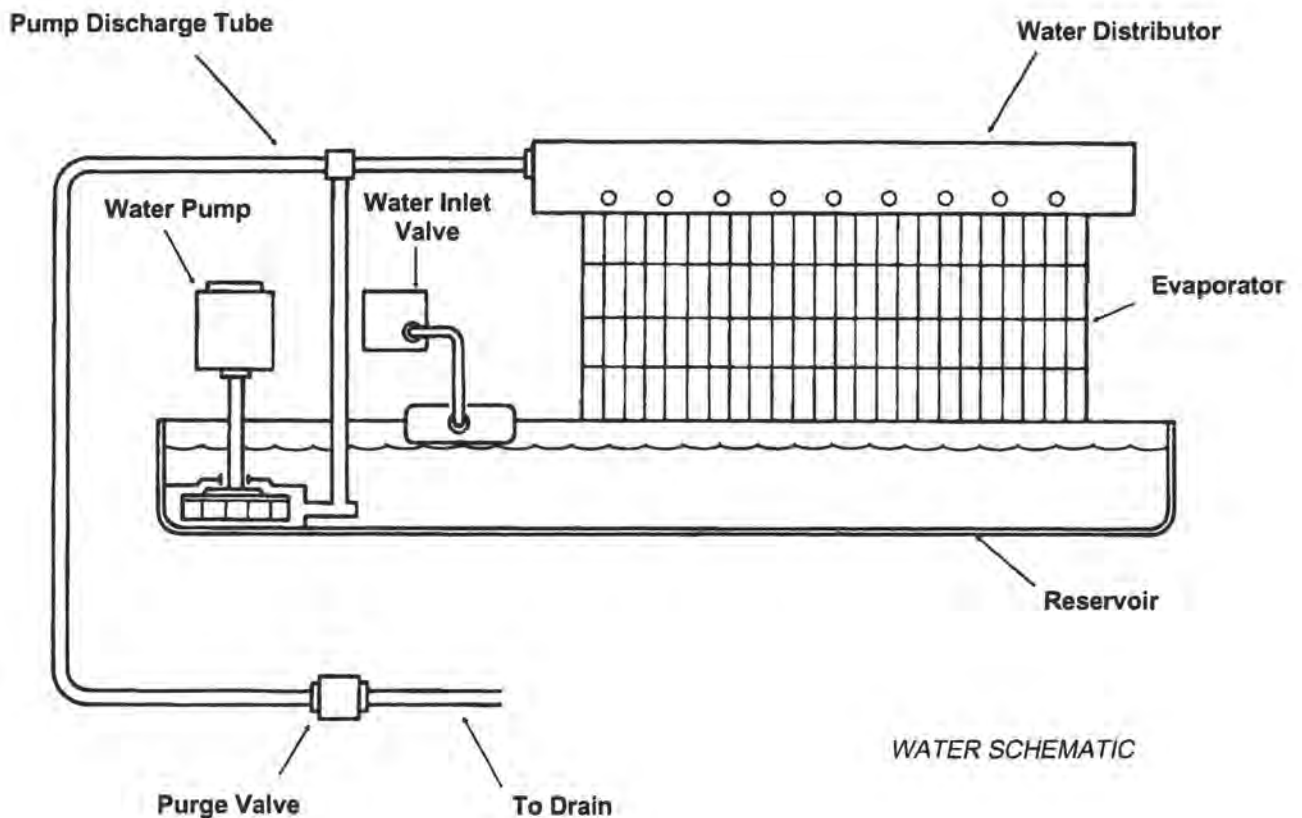
A nylon type brush may be used to scrub stubborn deposits.

SCE170

Water Schematic:

Water flows into the ice machine from its inlet connection at the back of the cabinet, through the float valve and into the reservoir. The water in the reservoir is pumped up and through the water distributor tube at the top of the evaporator. From there, the water flows over freezing surface of the evaporator and back into the reservoir. Melted ice and water spills into the bin flow through a drain in the base of the bin to the exterior drain connection at the back of the cabinet.

During the Harvest Cycle, the Purge valve opens, allowing the water pump to discharge water from the reservoir to the drain. At the same time water re-enters the reservoir. Very little water will flow across the evaporator during this time.



Refrigeration Schematic:

Freeze Cycle:

From the compressor, hot discharge gas is pumped to the condenser, either air or water cooled.

At the condenser, heat from the refrigerant flows into the cooling medium, either air or water, and the refrigerant condenses into a liquid. From the condenser the liquid refrigerant flows through the liquid line to the metering device - a thermostatic expansion valve.

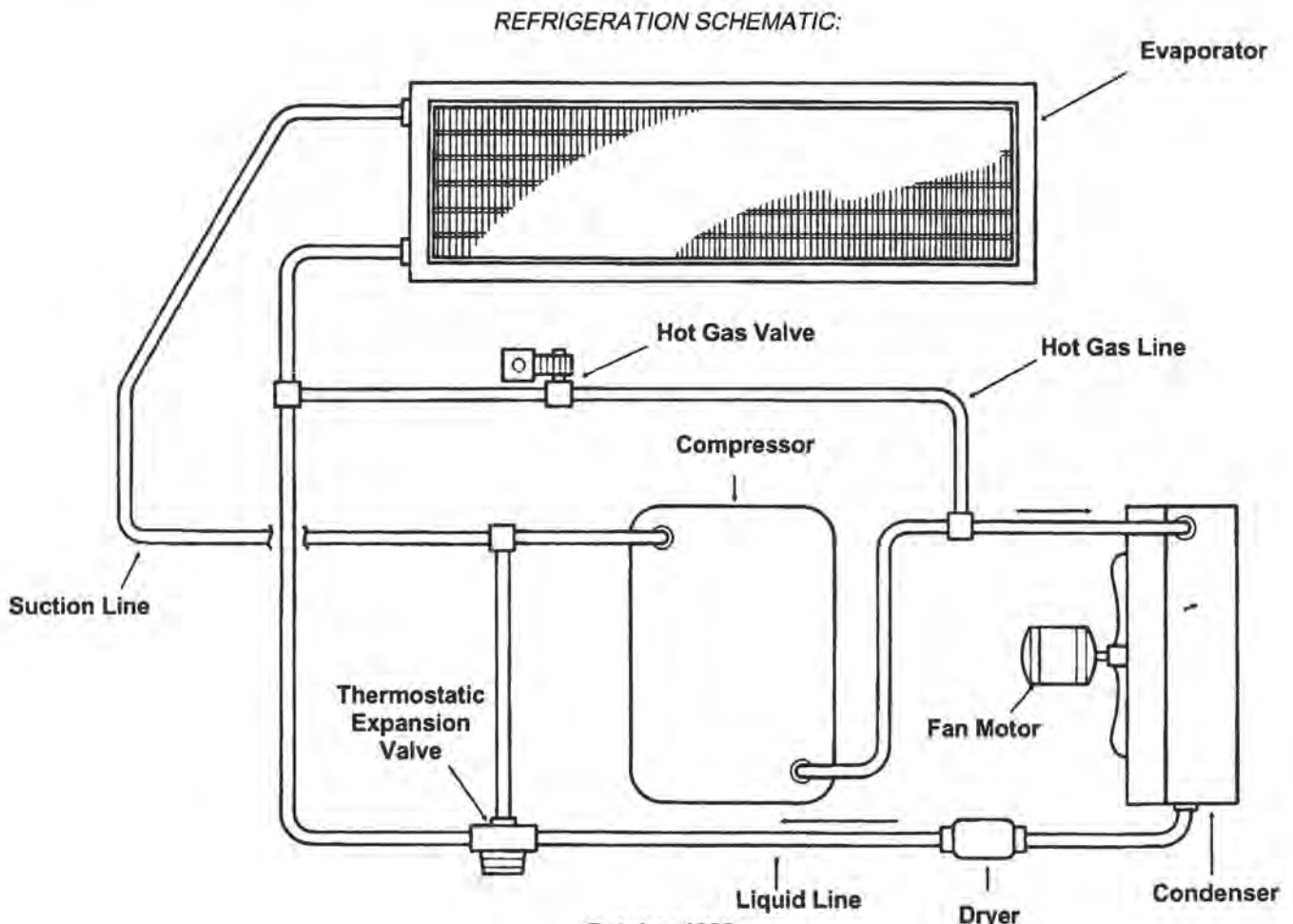
At the externally equalized thermostatic expansion valve, the liquid refrigerant passes from a high pressure zone to one of relatively low pressure, and in the low pressure zone it evaporates. The low pressure zone where the refrigerant evaporates is the evaporator. When the refrigerant evaporates, it absorbs heat from the metal parts of the evaporator and the water flowing over it.

From the evaporator, the refrigerant flows back to the compressor through the suction line.

Harvest Cycle:

During the harvest cycle, the refrigerant flows from the condenser, through the discharge line to a branch in the line containing the Hot Gas Valve. This valve is Open during the harvest cycle, allowing the hot discharge gas to bypass the condenser and enter the evaporator at its inlet.

The hot discharge gases warm up the evaporator enough to allow the surface of the ice frozen to the evaporator to melt. The remaining ice will then fall off into the bin.



SCE170

Technical Characteristics

Typical Cycle Time

- 15 - 20 minutes (time depends upon how clean unit is, plus the air and water temperatures).

Typical Harvest Ice Weight

- 1.6 to 1.8 lb. ice harvested per cycle.

Typical Low Side Pressure

- 25 PSIG just before harvest

Typical Freeze Cycle Discharge Pressure

- Air cooled: 300 PSIG declining to 210 PSIG
- Water cooled: 245 PSIG

Refrigerant Type / Charge

- Air Cooled: R-404A / 17 ounces A series, 16 ounces B and C series
- Water Cooled: R-404A / 9 ounces A series, 11 ounces B series and 10 ounces C series

Harvest Time:

- Varies with ambient, usually about 1.5 - 2 minutes. Unit is in harvest until the curtain opens. The unit may remain in harvest a maximum of 7 minutes, after which the machine returns to the freeze cycle.

Typical Low Side Pressure, in harvest

- 85 - 100 PSIG

Typical Discharge Pressure in harvest

- 195 - 210 PSIG

Hi Pressure Cut Out

- Cuts Out at (450 PSIG air cooled, 350 PSIG water cooled); Cuts In at 350 PSIG (air cooled)

Typical Compressor Amp Draw

- Freeze: 6-7
- Harvest: 7-8

Superheat

- 4-6° F. 10 minutes into freeze cycle. TXV is not adjustable.

Finish Freeze Time

- 4 minutes after cube size thermostat closes (indicator light on control board is ON in Timed Freeze)

Air cooled fan motor

- 16 watt rating; 1500 RPM; CW. Stops during harvest.

Compressor

- Copeland hermetic, capacitor start, induction run.

Water Pump Motor

- 4 pole, unit bearing type.

Cube Size Control

- Adjustable Cut In temperature as needed to obtain correct ice bridge thickness, about 8°F. - 10°F.
- Cut In at about 31 PSIG (with normal heat load)

Service Diagnosis

Proper service diagnosis begins with observation, comparing the complaint to the operation of the unit. Ice machine service diagnosis should proceed from water, to electrical and then to refrigeration.

SYMPTOM	POSSIBLE CAUSE	PROBABLE FIX
No ice is made	No water due to water turned off.	Reconnect water supply.
	No water due to float valve plugged up.	Clean out float.
	No water due to float stuck in closed position.	Replace float.
	No water due to purge valve leaking water down drain.	Replace purge valve.
	Water in reservoir, no flow over evaporator due to water leak at discharge hose.	Repair leak.
	Water in reservoir, no flow over evaporator due to pump not operating.	Replace pump.
	Water in reservoir, no flow over evaporator due to water distributor plugged up.	Clean water system.
	Unit in CLEAN or Harvest cycle	Switch ON/OFF/CLEAN switch to OFF and then ON.
No ice is made, nothing operates.	No power	Reconnect power.
	ON/OFF/CLEAN switch in OFF position	Switch ON/OFF/CLEAN switch to ON.
	Curtain in open position	Check for obstruction keeping the curtain open. Check that curtain is properly mounted. Check curtain sensor & indicator light.
	High pressure cut out open, reset and check:	Air cooled: check fan motor for stalling, condenser/filter for dirt, loose fan blade.
		Check water cooled unit for proper water supply
		If overcharged or there are non condensables in refrigeration system, replace refrigerant with correct charge.
		Replace H.P. cut out if it opens at too low a pressure.
Unit may have stuck in harvest cycle in a very warm ambient, check operating conditions.		
Control board open	Replace control board.	
Unit does not shut off.	Curtain sensor does not work.	Check curtain sensor and control system.

SCE170

Service Diagnosis

SYMPTOM	POSSIBLE CAUSE	PROBABLE FIX
Unit shuts off before bin is full.	Ice hangs up between curtain and reservoir.	Check action of curtain, check cube size.
Makes ice, but cubes are mal-formed.	Water distributor is dirty.	Clean water system.
	Cube size set wrong.	Adjust cube size control.
	Refrigerant leak. Cubes will be smaller or missing beginning at the top half of the evaporator.	Locate leak, repair, replace dryer, evacuate and weigh in nameplate charge
Cubes/bridge too thick.	Cube size control set too cold.	Adjust cube size control.
	Refrigerant leak, causing suction line temperature to be warm, keeping unit in the freeze cycle.	Locate leak, repair, replace dryer, evacuate and weigh in nameplate charge
Cubes too small, unit may stay in harvest because ice will not push curtain open.	Cube size control set too warm.	Adjust cube size control.
	Short freeze cycle caused by slush.	Some slush is normal. Check purge valve for leak-thru.
Machine goes into harvest, but ice on evaporator will not defrost - freezes up.	Cube size set too small.	Adjust cube size control.
	Cube size set too large.	Adjust cube size control.
	Hot gas valve will not open.	Coil of valve open, replace. Valve will not open, replace.
Unit freezes, but will not try to harvest.	Cube size control will not close; to check: Unplug water pump, switch unit Off and then ON, in about 2 minutes the Timed Freeze Light on control board should be ON	If timed freeze light does not go ON, replace cube size control.
	Timed freeze light glows, but after 4 minutes unit does not power hot gas nor purge valves.	Replace control board
	Very low on refrigerant	Check pressures
Low capacity/long freeze cycle.	Extreme hot location	Relocate the unit.
	Air cooled condenser or filter dirty.	Clean condenser/filter.
	Cubes too big.	Adjust cube size control.
	Water leak from reservoir.	Repair leak.
	Float valve does not shut off.	Replace float.
	Water temperature very high	Advise user
	Purge valve leaks by slowly.	Replace purge valve.
	Overcharged with refrigerant.	Evacuate and weigh in nameplate charge
Long harvest cycle	Hot gas valve leaks thru	Check hot gas valve. There should be frost on line between evaporator and valve during the freeze cycle.
	Cube size set too large	Adjust cube size
	Sticking in harvest	Check cube size or for slush

Service Diagnosis

SYMPTOM	POSSIBLE CAUSE	PROBABLE FIX
Machine operates, no ice is formed.	Unit stuck in harvest cycle.	Check for curtain stuck closed. Cubes too small, adjust bridge thickness, see Cube Size/Bridge thickness section
	Refrigerant leak	Locate leak, repair, replace dryer, evacuate and weigh in nameplate charge
	Compressor will not operate	Check compressor contactor coil.
		Check compressor.
		Check compressor start circuit
	Hot gas valve stuck open.	Replace hot gas valve.
	Refrigerant leak.	Locate leak, repair, replace dryer, evacuate and weigh in nameplate charge.
Hot gas valve and purge valve stay on after curtains close and both curtain indicator lights are on.	Replace control board.	
Purge valve leaks thru.	Clean or replace purge valve	
Compressor cycles on and off.	Compressor overheats.	Low on refrigerant. Repair leak, evacuate and weigh in nameplate charge
		Air cooled - fan not blowing, repair fan.
		TXV not letting enough refrigerant into evaporators, replace TXV.
		Mechanical fault with compressor, replace compressor.
		Check start capacitor
		Check start relay
Frost on compressor	Some frost will not hurt.	Do nothing.
	TXV meters too much refrigerant.	Replace TXV.
To check bin control system:		
When curtain is closed, BOTH curtain indicator lights on the control board in the control box should be ON, if not:	Curtain not closed properly	Check action of curtains
	Sensor not in correct position	Place sensor assembly in correct position
	Curtain missing	Replace curtain
	Curtain sensor has failed.	Replace sensor assembly.

SCE170

Removal and Replacement: Cube Size Control

Control Box Service

The control box may be lifted up from its normal position to improve service access.

To Move Control Box

1. Disconnect electrical power.



2. Go thru the steps to remove the hood, door and bin.

3. Locate and remove the 3/8" hex head screw holding the control box to the base, just below the purge switch.

4. Pull the control box forward about an inch.

5. The control box may now be moved up the height of the control box, be careful not to kink any capillary tubes.

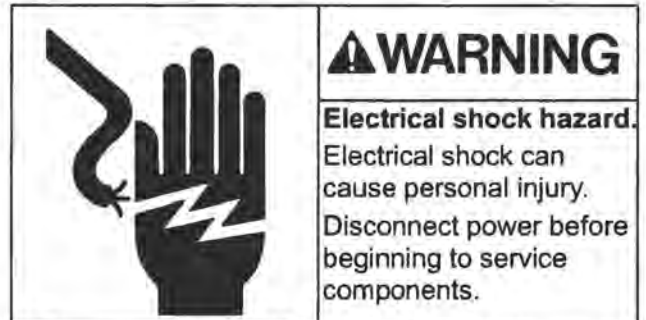
6. After service, replace the control box in its normal position.

Cube Size Control (bridge thickness):

Before replacing the cube size control, it should be positively determined that it is at fault.

Check the operation of the cube size control by unplugging the water pump, removing the right front grill and control box cover, and watching the Timed Freeze Light. With no ice on the evaporator, switch the ice machine to ON. The temperature of the suction line where the cube size control bulb is located should be about 8-10° F. about 2 minutes into the freeze cycle (with the water pump unplugged). Or the low side pressure should be about 31-32 PSIG. The cube size control should then close its contacts and cause the Timed Freeze Light on the control board to be ON. If it cannot be adjusted to close at that point, or if it does not open when warm, replace it.

1. Disconnect electrical power.



2. Remove the hood, door and ice storage bin.

3. Remove the control box cover.

4. Locate the cube size control.

5. Remove the two screws holding the control to the control box, and lift the control out.

6. Pull the two wires off the posts of the cube size control.

7. Follow the capillary tube of the cube size control and remove it from the grommet in the back of the control box.

8. Locate bulb on suction line and remove insulation covering bulb.

9. The end of the cube size control is inserted in a socket attached to the suction line. Pull it out of the socket.

10. Replace the cube size control with the proper part number, following the above steps from 9-1. Be sure to re-insulate the cube size control bulb.

Removal and Replacement: Water Pump

Water Pump

The pump provides the force to move the water from the reservoir to the freezing surface. The pump does not need oil, but if it becomes noisy, overheats, or will not pump it should be replaced. Be certain to confirm electrical faults with a voltmeter or ohmmeter before replacing the pump.

✓ The pump should operate with the compressor.

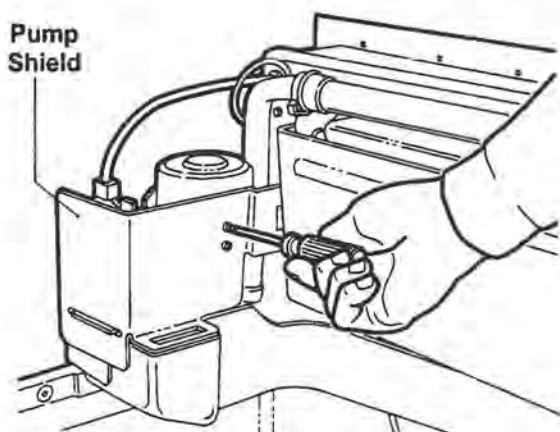
1. Unplug or disconnect the electrical power.



2. Open the bin door and unscrew the knobs holding the hood to the bin.

3. Pull the hood off the bin. Note: the bin door will come out the back of the hood when the hood is removed from the bin.

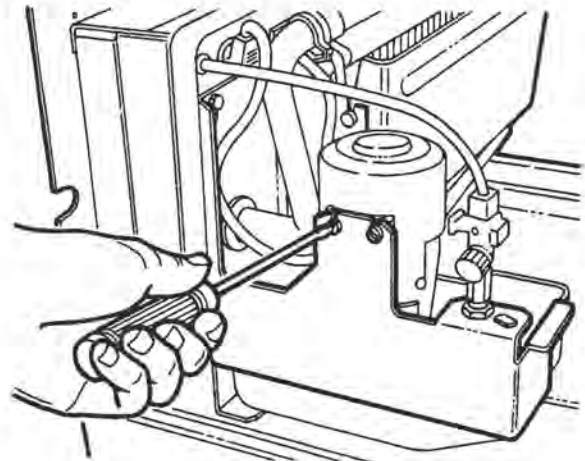
4. Remove screw and pump shield.



5. Unplug the pump from its connection at the back of the stainless steel wall.

6. Loosen the two fasteners holding the pump to the bracket.

Note: The two pump fasteners are hex head screws. When the unit is built in, they can be loosened using a 1/4" socket.



7. Pull discharge hose from pump discharge port.

8. Remove pump from ice machine.

9. Reverse above steps to replace.

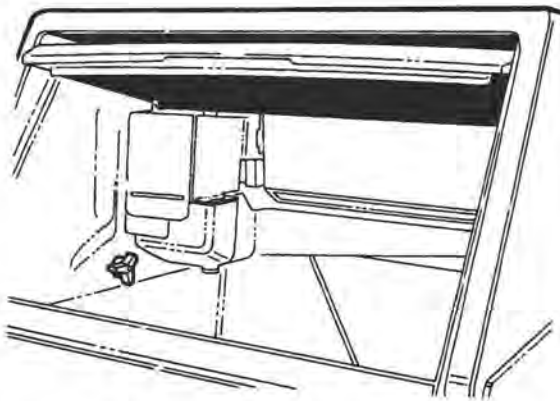
SCE170

Removal and Replacement: Float Valve

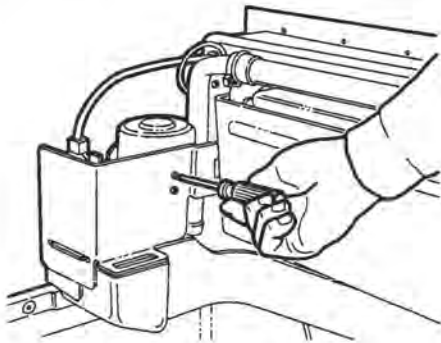
Float Valve

The float valve allows water to enter the reservoir but not overflow it. If the float sinks, or the valve will not seat, the float valve should be replaced. The float may plug-up from minerals in the water, and may be cleaned rather than replaced.

1. Shut off the water supply.
2. Open the bin door.

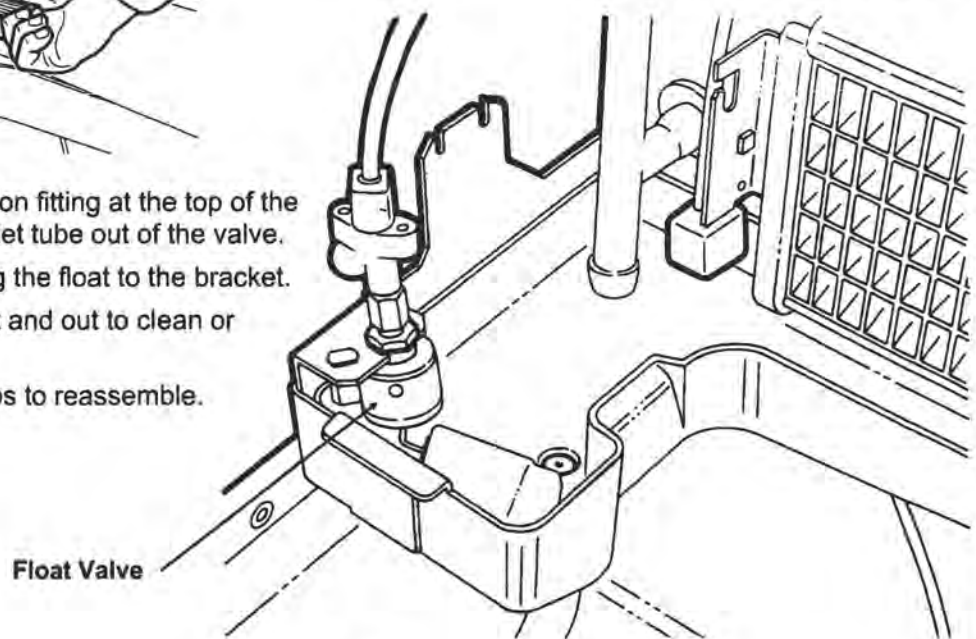


3. Remove the pump shield.



4. Unscrew the compression fitting at the top of the float, and pull the water inlet tube out of the valve.
5. Loosen the nut securing the float to the bracket.
6. Pull the float to the right and out to clean or replace.
7. Reverse the above steps to reassemble.

Note: This illustration shows the pump removed. It is **NOT** necessary to remove the pump to remove the float.



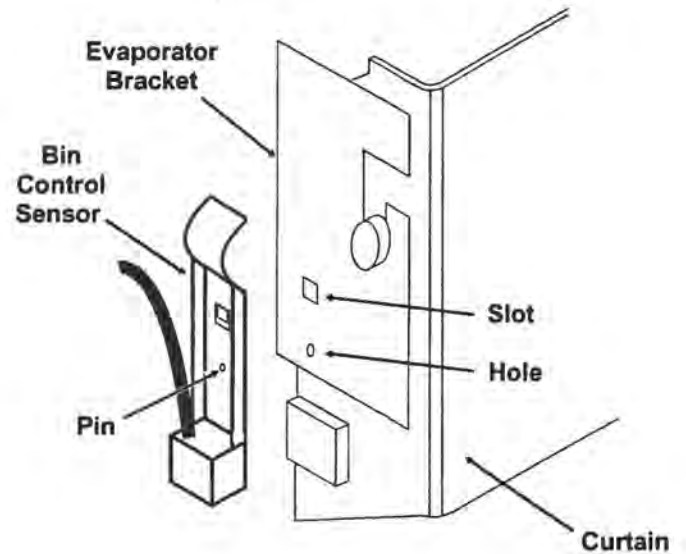
Removal and Replacement: Curtain & Bin Control

Bin Control Sensor

The bin control sensor should only be changed if it has been determined that it has failed. An easy check is to remove the right grill and the control box cover. Then, with no ice near the curtains and the machine plugged in (& switched on), move the curtain in and out. The light on the board in the control box should go on and off with the motion of the curtain. If not, replace the bin control sensor.

1. Disconnect electrical power.
2. Remove the hood, door and ice storage bin.
3. Locate bin control sensor on the left end of the evaporator.
4. Move the bottom of plastic sensor housing left until the pin is clear of the hole in the evaporator bracket.
5. Pull the sensor housing up and out of the slot in the evaporator bracket.
6. Trace wires to plug connection near control box, unplug and remove assembly from unit.
7. Reverse to reassemble. Note: Bin control sensor must be full seated in the slot and the pin snapped into the matching hole in the bracket.

Removal/Replacement of Bin Control Sensor



Curtain

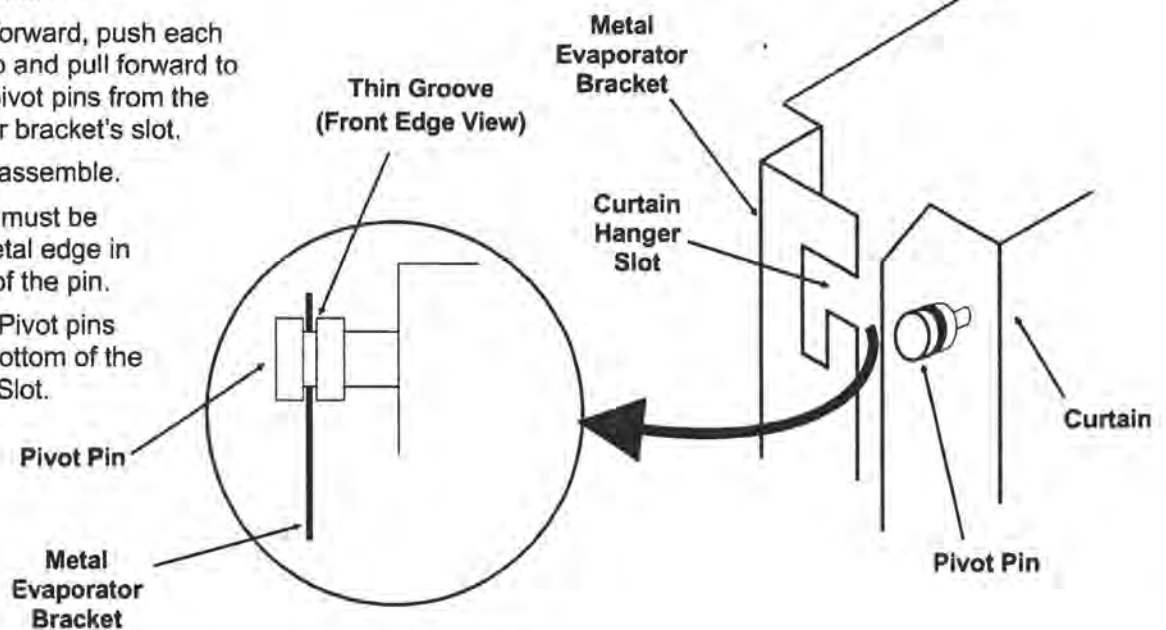
The Curtain has a magnet embedded in the left end. The location of this magnet is used by the bin control sensor to determine harvest and bin full. To replace the curtain:

1. Open the bin door.
2. Pivot curtain forward, push each end of curtain up and pull forward to remove plastic pivot pins from the metal evaporator bracket's slot.
3. Reverse to reassemble.

Note: Pivot pins must be installed with metal edge in the thin groove of the pin.

When installed, Pivot pins must be at the bottom of the Curtain Hanger Slot.

Removal/Replacement of Curtain



SCE170

Removal and Replacement: Purge Valve

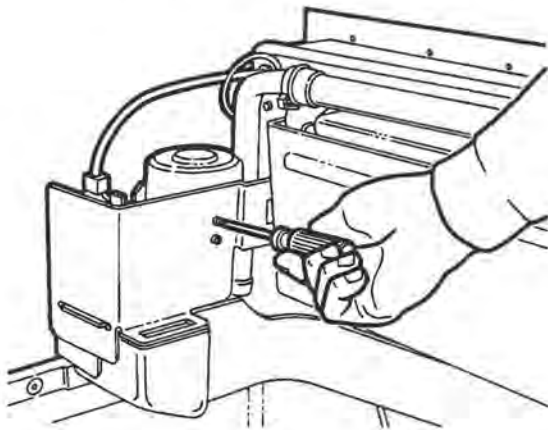
Removal:

1. Unplug unit.

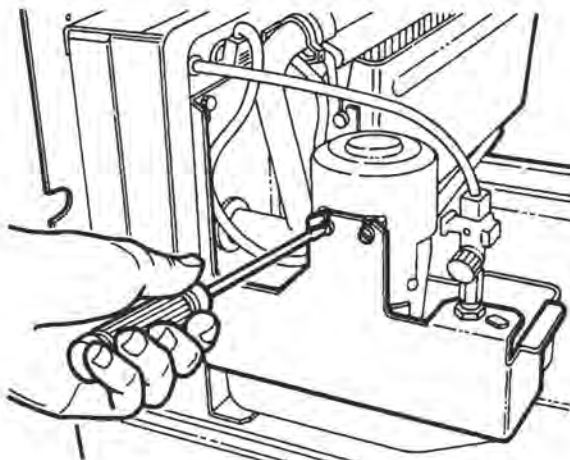


2. Open bin door, remove hood fasteners and pull hood from ice machine.

3. Remove one screw and pump shield.



4. Loosen 2 screws (1/4" hex head) holding pump to bracket.



5. Disconnect discharge hose from pump, water distributor and valve.

6. Pull pump up and out of the machine. Retain for re-installation.

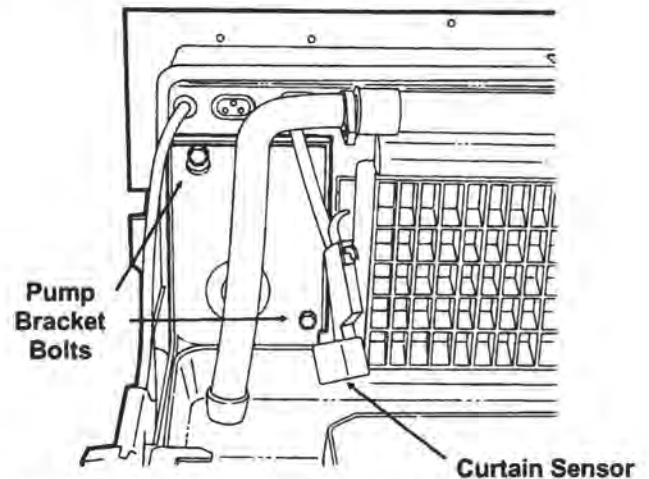
7. Remove curtain, set aside for re-installation.

8. Shut water off.

9. Loosen float valve retaining nut, slide float valve to the right and allow to hang by the incoming water line.

10. Remove plug from under reservoir and drain the reservoir.

11. Unclip curtain sensor.

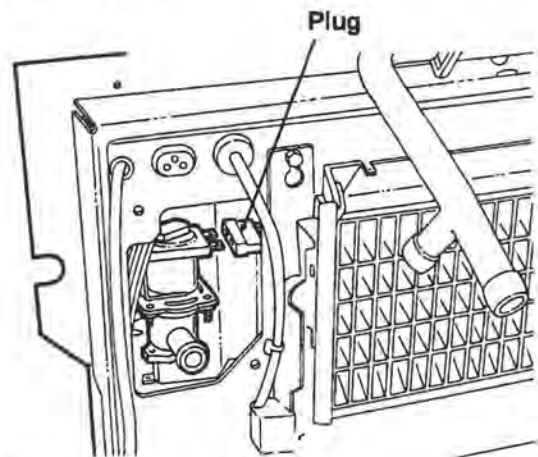


12. Remove reservoir support fastener from left end of reservoir.

13. Remove lower pump bracket bolt, and **loosen** upper pump bracket bolt.

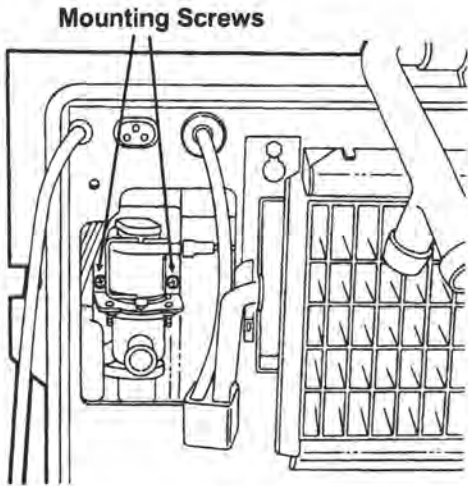
14. Remove pump bracket and set aside; lower reservoir into bin.

15. Locate electrical power plug to purge valve coil, remove plug.

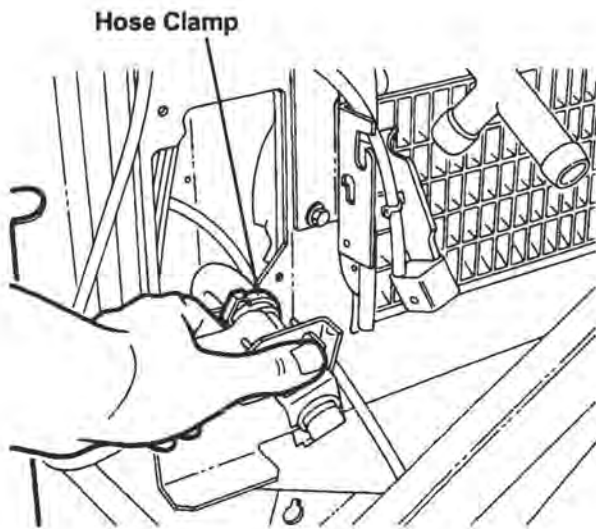


Removal and Replacement: Purge Valve

16. Unscrew the two screws holding the purge valve to the ice machine.



17. Pull the purge valve forward until the discharge hose clamp is accessible.



18. Loosen hose clamp and pull purge valve from ice machine.

Service:

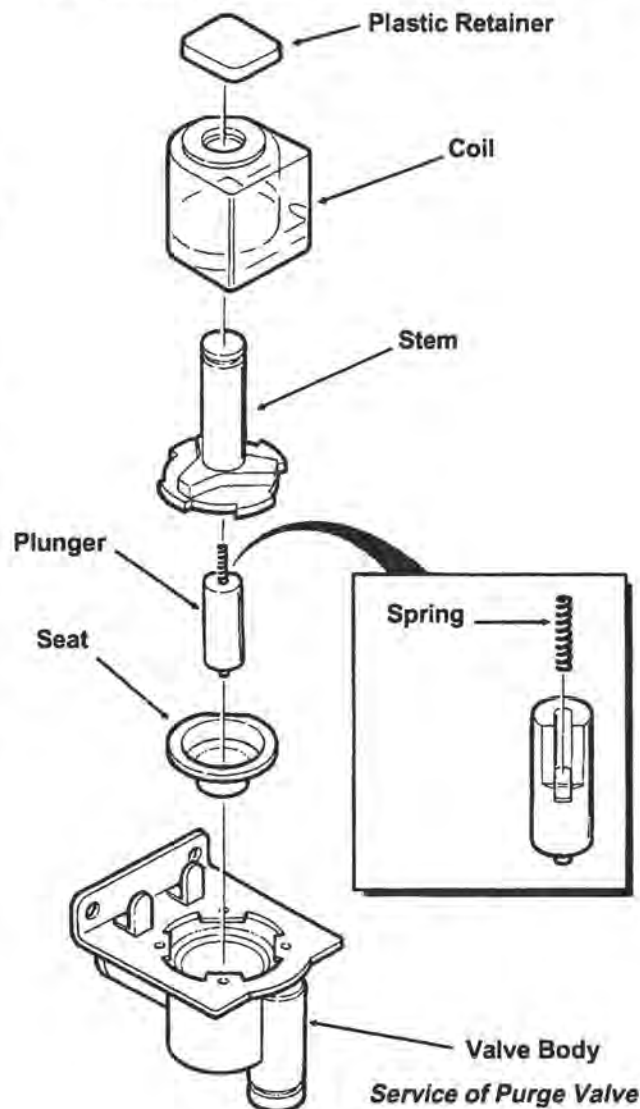
19. Remove coil:

- Flip plastic retainer up and slide off valve.
- Pull coil up and off valve.

20. Open valve:

- Rotate stem CCW as far as it goes.
- Lift stem up and off valve.
- Pull up on plunger - do not lose spring.

21. Examine seat & plunger for dirt/damage. Clean and reassemble. If damaged, replace valve.



22. Reverse above steps with original parts or new valve to reassemble.

SCE170

Water Distributor

The water distributor tube will typically not require any service beyond removal for cleaning. If needed, remove the water distributor by:

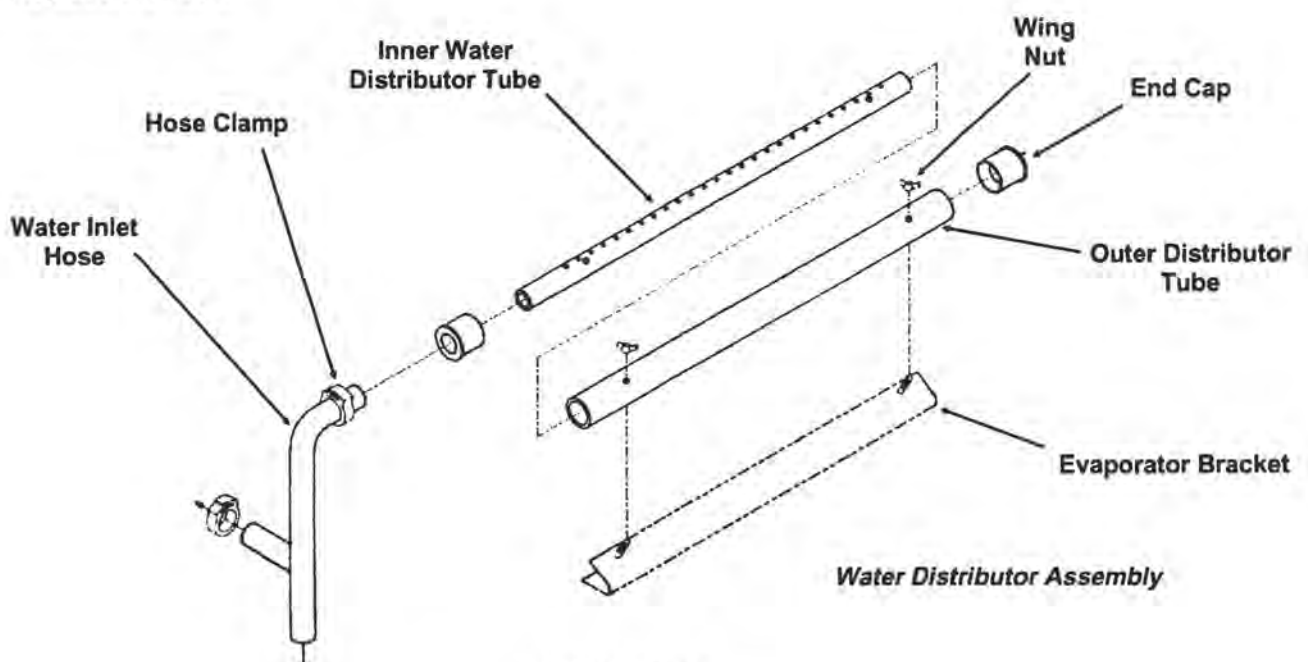
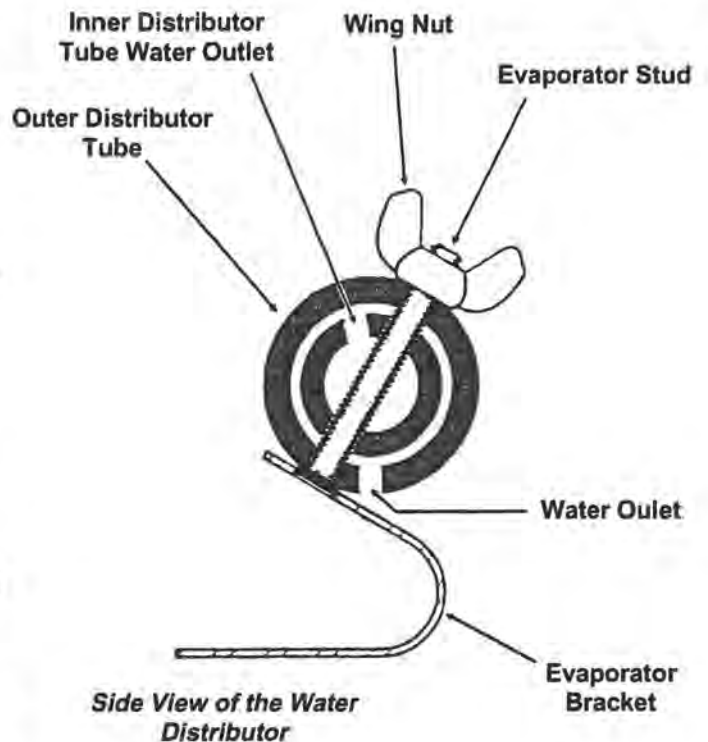
1. Remove the hood.
2. Remove lower right front grill.
3. Switch master switch to OFF.
4. Loosen hose clamp at water distributor inlet (on left).
5. Remove the two wing nuts holding the distributor to the evaporator.
6. Lift water distributor off the studs.
7. Pull the inner distributor tube out of the outer distributor tube and clean out all holes.

To reassemble.

8. Align the tube so that the inner distributor tube's holes are opposite the outer distributor tube's holes.
9. Place the end caps onto the water distributors.
10. Place the distributor tube onto the mounting studs:

NOTE: The Outlet Holes Face Down, Towards The Evaporator.

11. Replace the wing nuts, hose and hose clamp.
12. Switch the machine back on and check the water flow.
13. Replace the hood.



Refrigeration System Service: HP62 (R-404A)

Pressure-Temperature Chart for HP62

This ice machine uses R-404A refrigerant and polyolester oil. Do NOT use mineral oil in this refrigeration system.

- R-404A is a "Near Azeotrope" so liquid charging is required:
 - ▣ Weigh in as liquid as much of the charge as possible into the discharge line.
 - ▣ Install a sight glass between the manifold and the suction side hose and carefully meter liquid into the suction side, using the manifold valve to "flash off" the liquid before it enters the ice machine. Do this until the proper amount of refrigerant has been weighed into the system.
- When the system is serviced, a special liquid line drier is required. It is included with replacement compressors.
- HP62 is not compatible with mineral oil, so these ice machines use Polyolester oil. Polyolester oil absorbs water very easily. When one of these refrigeration systems is opened for service, it must be re-sealed as soon as possible (15 minutes maximum).
- Special leak detection equipment is required to locate small refrigerant leaks. Usually a leak detector capable of detecting a Halogenated refrigerant or HFC-134A will work. Check with the leak detector manufacturer if in doubt.

VAPOR		VAPOR	
TEMP.	PRESSURE	TEMP.	PRESSURE
(DEG F)	(PSIG)	(DEG F)	(PSIG)
-20	17	70	146
-18	18	72	150
-16	20	74	155
-14	21	76	161
-12	23	78	166
-10	24	80	171
-8	26	82	177
-6	28	84	182
-4	29	86	188
-2	31	88	194
0	33	90	200
2	35	92	206
4	37	94	212
6	39	96	219
8	41	98	225
10	43	100	232
12	46	102	239
14	48	104	246
16	50	106	253
18	53	108	260
20	55	110	268
22	58	112	275
24	60	114	283
26	63	116	291
28	66	118	299
30	69	120	307
32	72	122	316
34	75	124	324
36	78	126	333
38	81	128	342
40	85	130	351
42	88	132	360
44	91	134	370
46	95	136	379
48	99	138	389
50	102	140	399
52	106	142	409
54	110	144	420
56	114	146	430
58	118	148	441
60	123	150	452
62	127	152	464
64	132	154	475
66	136	156	487
68	141	158	499

SCE170

Liquid Charging

Instructions for R-404A

In preparation for charging, the low side hose should have a sight glass, and/or a restrictor device (such as a "Charge Faster") installed in it for metering liquid into the low side of the system.

1. After a thorough evacuation to at least 200 microns, shut off the manifold valves and switch off the vacuum pump.
2. Place a drum of R-404A onto an electronic scale.
3. Attach the charging hose to the drum.
4. Open the valve on the drum and purge the charging hose.
5. Zero out the scale.
6. Shut the low side access valve at the ice machine.
7. Open the discharge manifold valve full open.
8. Watch the scale, when the correct charge is shown, shut the manifold valve.

Note: If all of the charge will not "go in" the discharge side:

A. Shut the discharge access valve at the ice machine.

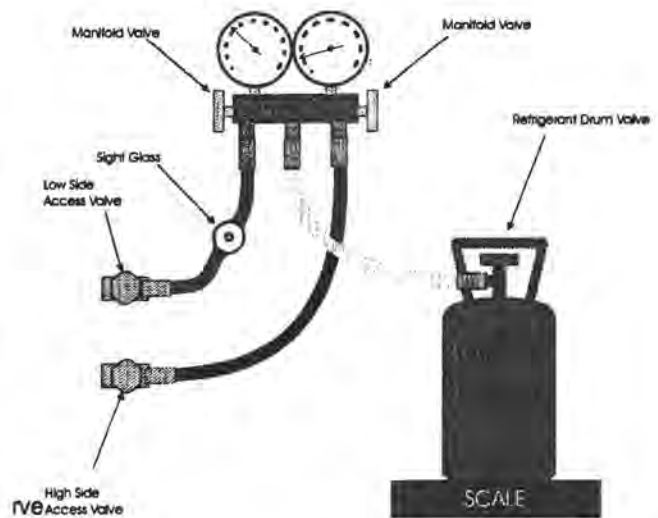
B. Switch the machine on.

C. Open the low side access valve at the ice machine.

D. Open the low side manifold valve and observe the sight glass to be certain that only gas is flowing into the system.

E. When the proper charge is indicated on the scale, shut off the manifold valve(s).

9. Shut off the valve on the refrigerant drum.
10. Re-open the manifold valves until all liquid has flowed out of the hoses.
11. Shut the low side access valve on the ice machine.
12. Remove hoses from ice machine and replace all caps.



Hose Connection Schematic for Liquid Charging

Refrigeration Service

General Information:

Work on the refrigeration system should only be done when it is certain that the system needs repair.

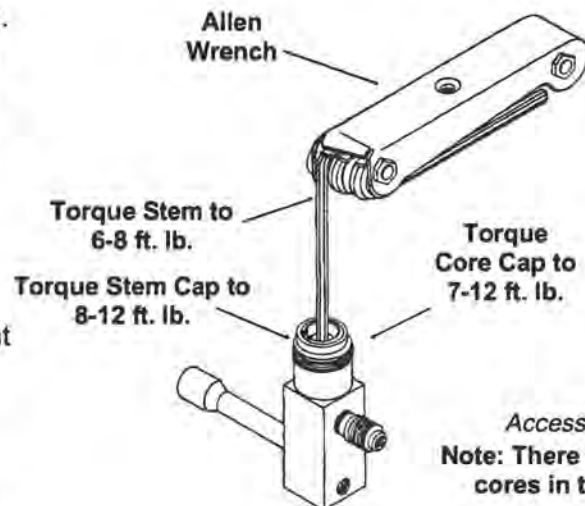
- **Refrain from checking refrigeration pressures without reason.** Visual inspection of the water system, observation of the ice formation, amp draw, voltage, and other techniques will lead to proper diagnosis. Scotsman also recommends that, at the time of initial start up, gauges not be used.
- If gauges must be used, don't always check the high side pressure. If the condenser is clean and seems to be operating correctly, it most likely is. The low side pressure is more important on an ice machine than the high side.
- If gauges must be used, use very short hoses to minimize refrigerant discharged into the air.
- Refrigerant should not be added except as a way to determine the proper operation of the product. If the system was low on refrigerant, there is a leak, and it must be found and repaired.
- This system has a critical charge, it must be recharged with the correct amount of refrigerant as listed on the nameplate of the ice machine, or performance will suffer.
- Anytime the refrigeration system has been opened, the dryer should be replaced. **Note: Only a HFC type dryer should be used.**
- When brazing the tubing connections to components such as the TXV, the component must be protected by heat sink material.

Recover, reclaim or recycle refrigerant. The method chosen is up to the service company. Any refrigerant placed into a Scotsman ice machine must meet ARI spec 700-88. Reclaim programs are available through most refrigerant wholesalers.

Access Valves: To use the access valves:

Remove the cap from the stem, use a 3/16" allen wrench to check that the valve is CLOSED. Then remove the core cap.

Close the valve and replace the caps when the job is finished. The valve must be closed and the caps must be on or the valve will leak.



UNPACKING

1. Inspect the cabinet for shipping damage. Report any damage to the freight carrier within 15 days of delivery. If a damage claim is to be filed, retain the carton.

2. Locate the service manual in the ice storage bin. Refer to it for installation instructions.

3. Remove the box containing the legs from the ice storage bin.

4. The ice machine is fastened to the skid. The bolts securing the ice machine to the skid screw in from the bottom.

To remove:

Use part of the carton as a cushion and tip the ice machine onto its back.

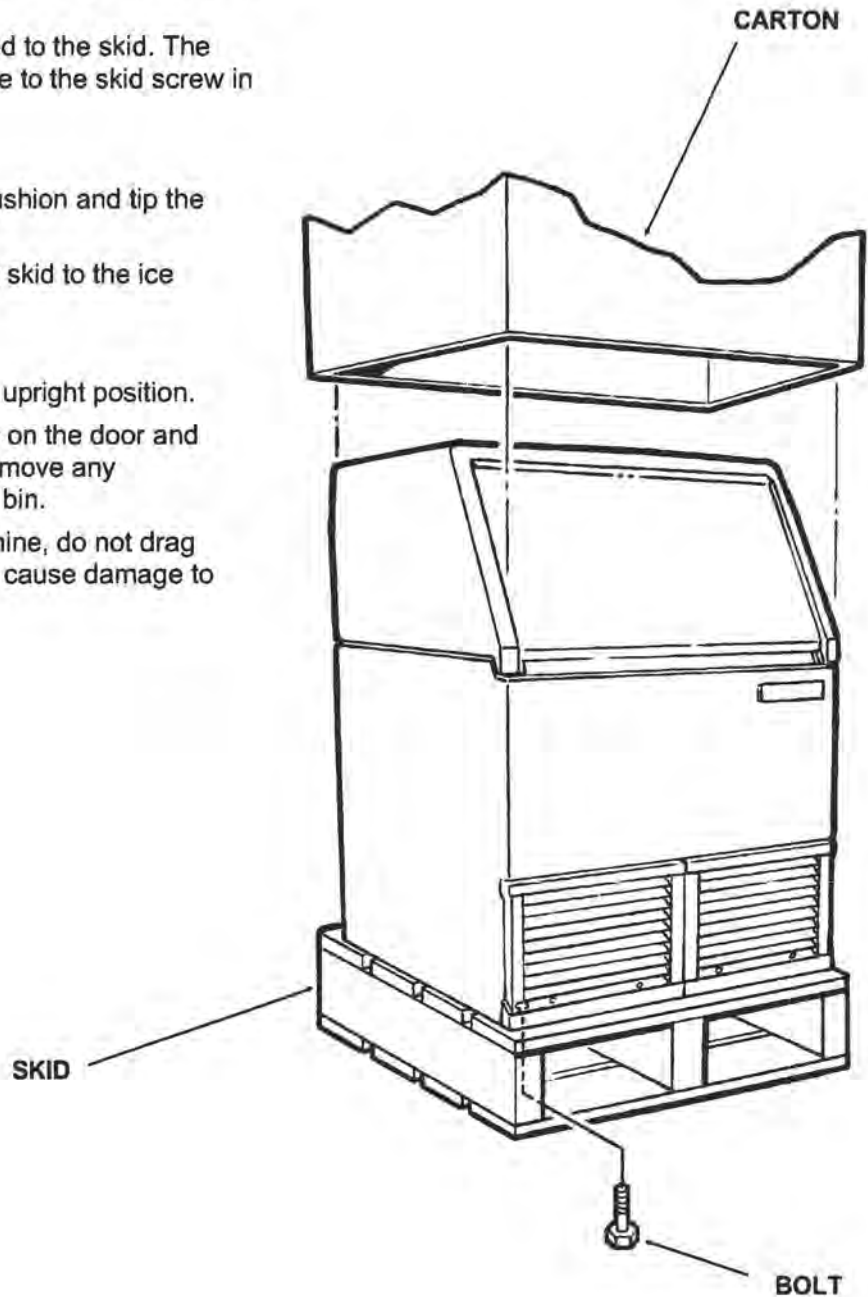
Remove the bolts holding the skid to the ice machine and the skid.

Install the legs.

Return the ice machine to an upright position.

5. Remove any shipping tape on the door and inside the ice storage bin. Remove any packing material found in the bin.

Note: When moving the machine, do not drag it; dragging the machine may cause damage to the legs or the cabinet.



SERVCO EQUIPMENT COMPANIES
3189 JAMIESON AVENUE
SAINT LOUIS, MISSOURI 63139
PHONE (314)-781-3189

MCKNIGHT ROAD CHURCH 7742
ITEM PAGE# 1

ITEM NUMBER- 30 QUANTITY- 001
DESCRIPTION- FILTER SYSTEM
MANUFACTURER- SCOTSMAN/REFRIG. SUPPLIES
MODEL NUMBER- SSM1
SERVICES

**NO OPERATION AND
MAINTENANCE MANUAL AVAILABLE**

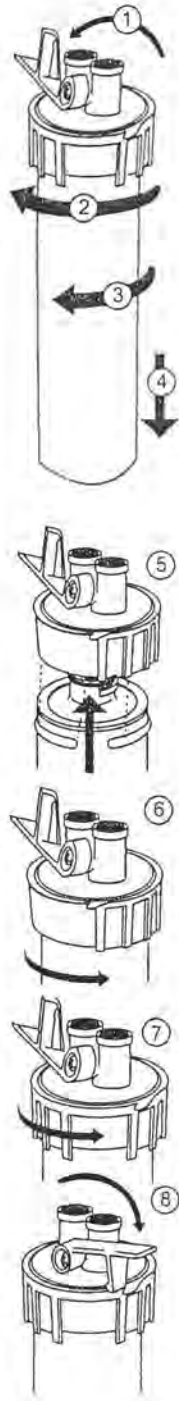
ELECTRIC-	VOLTS	PHASE	CYCLE
	KW (MOTORS)	HP	AMPS

STEAM PRESSURE- TYPE OF GAS-

ACCESSORIES, ATTACHMENTS, OR REMARKS

SCOTSMAN FILTER SYSTEM, MODEL #SSM1.
MOUNTED TO WALL AS INDICATED. FOOD
SERVICE EQUIPMENT SUPPLIER TO PIPE
FILTER TO ICE MACHINE. HANGING BRACKET,
FILTER AND CARTRIDGES. INSTALLATION ON
INCOMING BUILDING WATER LINE PRIOR TO
CONNECTION TO ICE MACHINE.

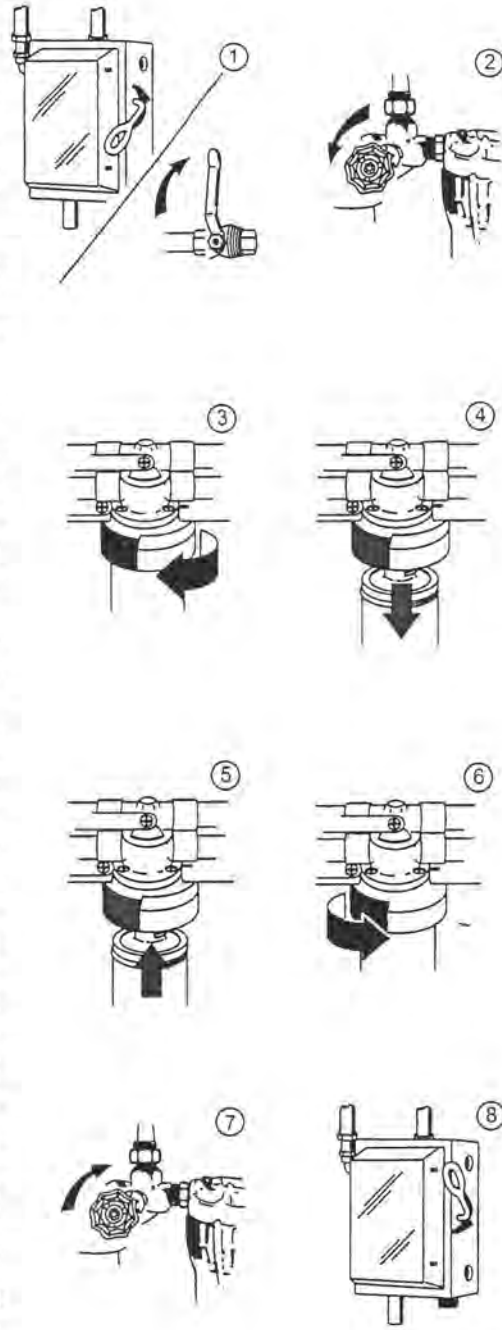
**Cartridge Change Instructions • Patroonuitwisseling • Patronenwechsel
Changement de Cartouche • Cambio de Cartucho • Cambio della Cartuccia**



1. Shut off water by lifting valve handle. Move counterclockwise as far as possible.
2. Turn colored ring all the way to the left. Ring will drop about 1/2".
3. Lift cartridge slightly and turn it further to the left until it can be disengaged.
4. Lower cartridge to disengage it from ring.
5. With colored ring in lowered position (turned all the way to the left) orient lug on cartridge with cutout under label on ring.
6. Insert cartridge straight up into ring as far as it will go. Holding colored ring steady, turn cartridge as far to the right as possible.
7. Then turn colored ring far right to drive cartridge up into head.
8. To lock ring in place and turn water on, move valve handle down. Be sure handle leg engages ring locking-lug.

GB

**Cartridge Change Instructions • Patroonuitwisseling • Patronenwechsel
Changement de Cartouche • Cambio de Cartucho • Cambio della Cartuccia**



1. Shut off power to equipment. Shut off inlet water ahead of system.
2. Open activation valve to relieve pressure.
3. Hold head firmly. Turn cartridge to left until it stops.
4. Pull cartridge downward and out of head.
5. Hold head firmly. Align cartridge lug with label. Insert cartridge firmly into head.
6. Turn cartridge right 90° until rotation stops. Repeat steps 3-6 for cartridges 2, 3 and 4.
7. With activation valve fully open, open inlet water at full force for five minutes. Close activation valve.
8. Turn on power to equipment.

GB

1. Schakel de stroom naar het apparaat uit. Sluit de watertoevoer naar het systeem af.
2. Open de activeringsafsluiter om de druk te ontlasten.
3. Houd de kop stevig vast. Draai de patroon naar links tot hij stopt.
4. Trek de patroon omlaag, de kop uit.
5. Houd de kop stevig vast. Breng het uitsteeksel van de patroon in één lijn met het etiket. Steek de patroon stevig in de kop.
6. Draai de patroon 90° naar rechts tot het draaien stopt. Herhaal stappen 3-6 voor patronen 2, 3 en 4.
7. Terwijl de activeringsafsluiter open is, opent u de toevoerwaterafsluiter. Laat water gedurende vijf minuten met volle kracht lopen. Sluit de activeringsafsluiter.
8. Schakel de stroom naar het apparaat in.

1. E
2. F
3. F
4. F
5. F
6. I
7. F
8. E



QUALITY ATHLETIC EQUIPMENT SINCE 1946

June 3, 2004

EQUIPMENT WARRANTY

TO: *Orf Construction Company*
4317 Bridgeton Ind. Dr
Bridgeton, MO 63044

REFERENCE PROJECT: *McKnight Road Church of Christ*
2515 McKnight Road
Saint Louis, MO 63124

AALCO JOB NUMBER: 12750

DEALER: *Orf Construction Company*

EQUIPMENT	(X)	BASKETBALL BACKSTOPS
	()	GYM DIVIDER CURTAIN(S)
	()	CUSHION WALL WAINSCOT PADDING - COLUMN PADDING
	(X)	POWER VOLLEYBALL EQUIPMENT
	()	BLEACHERS
	()	SCOREBOARDS
	()	BATTING/GOLF CAGES

WE HEREBY WARRANT THE ABOVE-MENTIONED EQUIPMENT SHALL BE FREE OF DEFECTS FOR A PERIOD OF ONE YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION, MAY 10, 2004. THIS WARRANTY DOES NOT COVER VANDALISM, CATASTORPHES, MIS-USE, DAMAGE CAUSED BY ALTERATIONS AS WELL AS ACTIVITIES OTHER THAN ITS INTENDED USE. THIS WARRANTY IS ALSO VOID UNLESS PROJECT IS PAID IN FULL.

THANK YOU,

Richard M. Pohrer

Richard M. Pohrer

RICHARD M. POHRER, PRESIDENT, CHRISTOPHER M. POHRER, VICE PRESIDENT

AALCO ATHLETIC EQUIPMENT • 1650 AVENUE H • ST. LOUIS, MO 63125

1-800-537-1259
314-544-4300

Fax 314-544-2386
www.aalcomfg.com

Remote control has one 9V battery

OPERATION & MAINTENANCE BASKETBALL GOALS

I. OPERATION

- A. Ceiling suspended basketball goals are raised & lowered by means of a ceiling mounted, electric hoist controlled by a wall-mounted, key-operated switch. The switch is turned LEFT to raise the backstop, RIGHT to lower it. The key must be held in order for the motor to continue to operate. If released, the switch will automatically return to center (OFF) position & shut off the motor.
- B. The hoist is equipped with "travel control mechanism" (set by the installer) which will automatically shut off the motor when the backstop reaches either UP or Down position. If stopping positions are not satisfactory, directions for adjustment are located on the inside over of the hoist-mounted box, which encloses the mechanism (& the reversing relay).
- C. The hoist motor is equipped with a manual reset overload (exactly like the reset button on a garbage disposal). If the hoist does not operate either up or down, this button probably needs to be reset.

II. MAINTENANCE

- A. LUBRICATION: AALCO equipment (including the hoist) is designed to be essentially free of need for periodic lubrication.
- B. CLEANING: The equipment easily cleaned with a mild detergent & water.
- C. SAFETY INSPECTION: Although most elements of Aalco backstops can be expected even with heavy use - to have a trouble-free life of at least 10 years, an annual safety inspection, especially of the hoist system (cable, pulleys, winch, etc.) is highly recommended.

SPECIFIC RECOMMENDATIONS:

ELEMENT	LUBRICATION	ANNUAL INSPECTION
Hinges	Factory greasing generally adequate	Exercised too little for wear to develop
Hoist cable	None	For broken strands
Cable Pulleys	Lubed-for-life, bronze bearings	Inspect sheaves for looseness on axle pin. Replace if more than 1/16" of play.
K500 Manual Winch	Lubed-for-life, bronze bearings. Grease gears annually.	Inspect for thinning of bronze gear teeth. Replace when half-worn.
Remote-control	Lubed-for life bearings & gears	Check gears for wear by turning the input (v-belt) shaft back & forth by hand. <u>No</u> clearance should be felt between the gears. Remove box cover if visual inspection is indicated.

VOLLEYBALL/TENNIS ACCESSORIES

POWER VOLLEYBALL NET

USVBA STANDARDS OF 10 M X 1 M (32' X 30'). 4" SQUARES, 3.0 MM TREATED NETTING. WHITE NYLON PERIMETER BINDING, 2½" WIDE DOUBLE SITCHED TO NET. 3/16" X 34' CABLE, TOP ONLY. ¼" BRAIDED WHITE NYLON ROPE ON BOTTOM. 1" WIDE NYLON TENSION STRAPS WITH QUICK ADJUST CAM BUCKLES. SIDE POCKETS WITH FIBERGLASS DOWELS FOR NET BRACING.

BN-10 BADMINTON NET

NETTING IS KNOTLESS NYLON ¾" SQUARE MESH WITH APPROXIMATELY 260# BREAK STRENGTH. NETTING IS TREATED WITH VINYL UVR RESISTANT DRIP. SIDES AND BOTTOM TAPED WITH 1400# BREAK STRENGTH WEBBING. TOP IS QUAD SEWN WITH 138# POLYESTER THREAD.

PVA ANTENNAS

TWO PIECE FIBERGLASS CONSTRUCTION, ENCASED IN HEAVY VINYL POCKET OF BOUNDRY MARKERS. TOP OF ANTENNA SHALL BE MARKED WITH ALTERNATING RED AND WHITE STRIPING.

PVM MARKERS

SHALL BE OF 2" WIDE HEAVY POLYESTER REINFORCED VINYL WHICH IS SECURED TO NET BY VELCRO ATTACHED TO BACKSIDE OF MARKERS. TOP OF MARKERS ARE TO BE BRIGHT RED. MEETS ALL USVBA REQUIREMENTS.

ATR TRANSPORTER RACK

HEAVY-DUTY STORAGE RACK THAT WILL STORE AND TRANSPORT 2 PAIR (4 EA.) POST STANDARDS, 1 JUDGES STAND WITH PADS, 2 SETS PADS, ANTENNAES AND MARKERS. FRAME IS CONSTRUCTED OF 2½" SQUARE TUBE. WHEELS ARE OF 5" DIA., LOCKING, NON-MARKING, SWIVEL CASTER WHEELS.

TN60 – TENNIS NET

A 3.0 MM BRAIDED DESIGN NET WITH 285 LB BREAK STRENGTH. IT HAS A 5.0 MM CABLE WITH A 2800 LB. BREAK STRENGTH AND WOOD DOWELS.

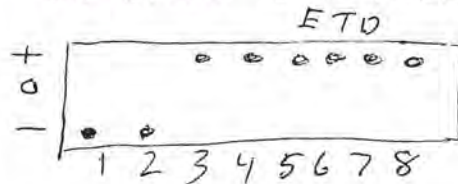
10/25/05 Installed spring 2004

Cables adjusted at the drum (roller) by AALCO people because west goal jerked about halfway up as it was raised. Problem was mis-alignment of cable as it rolled into drum, causing it to lay on, then slip off of a roll on the previously rolled cable on the roller.

11-29-09 Replaced 9V battery in "panel" to raise & lower goals
Broken clamp bolt (at nut) at upper goal support.
Lower bolt of the two at that location (roller like)

06-03-2012 Battery Low & buttons work intermittently.
Push buttons broken, down button stuck on.
Order New remote: Tag inside M0404 FOG

Tag inside
Switches (revers) switches
Buttons in blue "box" inside



Tag on back cover:
FCC ID: NM483TRAF
Model No. AX733T

Complies w/ FCC Rules, Part 15,
etc
151318

06-05-2012 Ordered new remote (in stock locally) \$90

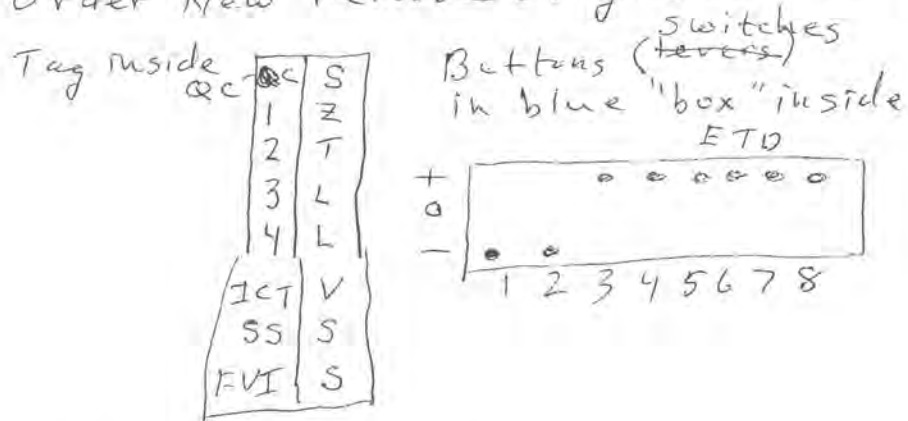
10/25/05

Cables adjusted at the drum (roller) by AALCO people because west goal jerked about halfway up as it was raised. Problem was mis-alignment of cable as it rolled onto drum, causing it to lay on, then slip off of a roll on the previously rolled cable on the roller.

11-29-09 Replaced 9V battery in "panel" to raise/lower goals
Broken clamp bolt (at nut) at upper goal support.
Lower bolt of the two at that location (roller like)

06-03-2012 Battery Low -

Push buttons broken, clown button stuck on.
Order New remote: Tag inside M0404 FOG



Tag on back cover:

FCC ID, NM483TRAF

Model No. AX733T

Complies w/ FCC Rules, Part 15,

etc

15: 1318



May 20, 2004

Orf Construction Company
4317 Bridgeton Industrial Dr.
Bridgeton, MO 63044

RE: McKnight Road Church of Christ

G&S Ref: I 21599

GUARANTEE AND WARRANTY

All labor and materials furnished or work performed by this contract are in accordance with the plans, specification and authorized additions thereto. Any exceptions to this shall be clearly noted below.

We guarantee our workmanship for a period of one year from the date of completion of this project.

Should any defects in our work develop during the guarantee period due to improper materials or workmanship, on written notice from the contractor, we will replace or repair such defect without any expense to the Owner. This guarantee will be enforceable directly by the owner.

"We hereby guarantee/warranty the installation of the Levolor Riviera horizontal blinds for a period of one year commencing on May 10, 2004 against failures of workmanship, material, etc. in accordance with the requirements of the specifications."

Ann Pund
Window Treatments Division

This warranty is null and void if the product is abused or used in a manner not recommended by the manufacturer.

Otis Elevator Company

North American Area
227 South Jefferson Avenue
St. Louis, MO 63103
314-533-7070
314-533-7804 (fax)
August 11, 2004



Otis

A United Technologies Company

Orf Construction
4371 Bridgeton Industrial Drive
Birdgeton, MO 63044

Attn: Brian Micklewright

Reference: McKnight Road Church of Christ

In compliance with the specifications for the above Contract, Otis has warranted to the owner to repair or replace any defects in material or workmanship that may develop in each elevator within one (1) year from the date of completion and acceptance of each elevator. This warranty does not cover ordinary wear or tear, improper use, vandalism, abuse, neglect by others, insufficient maintenance or causes beyond our control.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This warranty is also subject to the terms of our Contract.


Sandra Bitenshaw
Representative

NE/MOD Coordinator
Title

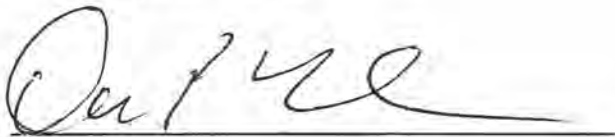


GUARANTEE FOR McKNIGHT ROAD CHURCH OF CHRIST

We hereby guarantee that the PLUMBING work, which we have installed at McKNIGHT ROAD CHURCH OF CHRIST located at 2515 McKNIGHT ROAD, LADUE, MO 63124 has been done in strict accordance with the drawing and specifications and that the work installed will fulfill the requirements of those specifications. We agree to repair or replace or cause to be repaired or replaced any or all of our work, which may prove to be defective in workmanship or materials, together with any adjacent work which requires repair or replacement because of our defective work, within a period of one (1) year(s) from date of Certificate of Final Completion, 05/10/04 of the above named project by the Owner. Damages caused by natural disaster, or unusual abuse and neglect by others are excluded from this guarantee.

If we fail to start compliance with the above paragraph within ten (10) days after receipt of written notice from Owner or Architect to do so, or fail to pursue such compliance with diligence, we, jointly and severally, do hereby authorize the Owner to proceed to have the defects repaired and made good at our sole expense, and we will honor and pay the costs and charges for it together with interest at the maximum rate then permitted by governing state law, upon demand. If we fail to fulfill the preceding obligations, and if Owner brings an action to enforce this guarantee, we agree to pay Owner's reasonable attorney's fee incurred in connection therewith.

Signed: O.J. Laughlin Plumbing Company, Inc.
(Subcontractor)

By: 

Countersigned: Orf Construction
(General Contractor)

By: 



May 28, 2004

Orf Construction
4317 Bridgeton Industrial Drive
Bridgeton, MO 63044

McKnight Road Church of Christ
2515 McKnight Road
Ladue, MO 63124

Office Maintenance Manual

Table Of Contents

WC-1 WATER CLOSET	6
K4350 *WELLCOMME LT VC BOWL	7
ZZ6000WS1 1.6 GAL CLOSET FLUSH VALVE	9
C1500STSCC001 EB BOWL SS HINGE OF CLST SEAT WHIT	10
WC-2 WATER CLOSET	11
K4368 *HIGHCLIFF LT 12 RI BOWL	12
ZZ6000WS1 1.6 GAL CLOSET FLUSH VALVE	14
C1500STSCC001 EB BOWL SS HINGE OF CLST SEAT WHIT	15
WC-3 WATER CLOSET	16
K4321WH WHITE *PRIMARY 10 RI VC ELONG BOWL	17
ZZ6000WS1 1.6 GAL CLOSET FLUSH VALVE	19
UR-1 URINAL	20
K5016ETWH *DEXTER 1.0 TOP SPUD URINAL WHIT	21
ZZ6003AVWS1 1 GAL URN FLUSH VLV ADA	23
ZZ1221 Z-1221 URINAL SUPPORT SYSTEM	24
LAV-1 LAVATORY	25
K2209-0 2209-0 WHT 15X12 CAXTON UM VC LAV	26
SS20 SGL LEV LAV FCT ONLY CP	27
KE5700PC CP OFFSET GRID DRAIN	28
PF8617COH 1-1/4 17 GA CP P TRAP W/ CO	30
PF202WH WHITE 3 PC P TRAP & SUPPLY COVER	31
BSR19C CP 1/2 SWT X 3/8 COMP ANGLE ST LK	32
B112AC CP 3/8X12 1PC LAV RSR	33
PFE7 5/8 OD ESC CP	34
LAV-2 LAVATORY	35
K2005WH WHITE 21X18 *KINGSTON 4 CC VC LAV	36
SS20 SGL LEV LAV FCT ONLY CP	38
KE5700PC CP OFFSET GRID DRAIN	39
PF8617COH 1-1/4 17 GA CP P TRAP W/ CO	41
PF202WH WHITE 3 PC P TRAP & SUPPLY COVER	42
BSR19C CP 1/2 SWT X 3/8 COMP ANGLE ST LK	43
B112AC CP 3/8X12 1PC LAV RSR	44
PFE7 5/8 OD ESC CP	45
ZZ1231 Z-1231 LAV SUPPORT SYSTEM	46
L-3 LAVATORY	47
K21964WH WHITE 20X17 *PENNINGTON 4 VC LA	48
SS20 SGL LEV LAV FCT ONLY CP	50
KE5700PC CP OFFSET GRID DRAIN	51
PF8617COH 1-1/4 17 GA CP P TRAP W/ CO	53
PF202WH WHITE 3 PC P TRAP & SUPPLY COVER	54

Table Of Contents

BSR19C CP 1/2 SWT X 3/8 COMP ANGLE ST LK	55
B112AC CP 3/8X12 1PC LAV RSR	56
PFE7 5/8 OD ESC CP	57
MSB-1 MOP BASIN	58
FMSB2424 24X24X10 MOP BASIN W/ 3 DRN	59
SH-1 SHOWER	60
AIS4136SH AQUABATH AIS4136SH	61
SS961 TEMPTROL SHWR VLV CP	62
EWC-1 ELECTRIC WATER COOLER	63
EEZSTLR8 8 GAL BI LVL ADA WTR COLR	64
BSR19C CP 1/2 SWT X 3/8 COMP ANGLE ST LK	66
PF8617COH 1-1/4 17 GA CP P TRAP W/ CO	67
TP-1 TRAP PRIMER VALVE	68
PPR500 1/2 PRIME RITE TRAP PRMR	69
PDU3 3 OPENING DIST UNIT W/O FITTING	72
ET-1 EXPANSION TANK	76
WDET5 2 GAL EXPANSION TANK FOR WTR HTR	77
WH-1 WALL HYDRANT	78
WB65C12 12 SWT FREEZELESS WALL HYDRANT	79
FD-1 FLOOR DRAIN	81
ZZ4157B4NH-P ZURN 4" FLR DRN NB TOP	82
FCO FLOOR CLEANOUT	83
ZZN1400NH ZURN CI ADJ CO W/ NB TOP	84
EWH-1 ELECTRIC WATER HEATER	85
ADEL15S12015 15 GAL ELEC 1.5KW 120V WTR HTR	86
GWH-1 GAS WATER HEATER	88
ABTH120 AOSMITH BTH-120	89
GI-1 GREASE INTERCEPTOR	90
ZZ1170 Z-1170 GREASE INTERCEPTOR	91
SP-1 ELEVATOR SUMP PUMP	92
SSE50 STANCOR 1/2 HP 120VAC PUMP SYSTEM	93
RP-1 CIRCULATING PUMP	94
BLR20BF 1/20HP IB BOOSTER PUMP L/ FLG	95
A-1 AQUASTAT	97
HL6006C1018 HONEYWELL AQUASTAT STRP ON SPDT 5-3	98
CBV-1 CIRC BALANICNG VALVE	99
VV006786CBV 3/4 SWT CIRC BALANCING VLV STAS	100
PRV-1 PRES REDUCING VALVE	101
W25AUB 25AUB SERIES PRESSURE REGULATOR	102
BFP-1 BACKFLOW PREVENTER	103

Table Of Contents

W009SQTF 3/4 BRZ IPS BACKFLOW PREVENTER

104

WC-1 WATER CLOSET

WC-1 WATER CLOSET

KOHLER K4350 *WELLCOMME LT VC BOWL

ZURN ZZ6000WS1 1.6 GAL CLOSET FLUSH VALVE

CENTOCO C1500STSCC001 EB BOWL SS HINGE OF CLST SEAT WHIT

FEATURES

- 10" (25.4cm) or 12" (30.5cm) rough-in
- 1-1/2" (3.8cm) top spud
- Vitreous china
- Elongated bowl
- 2-1/4" (5.7cm) passageway
- 11-3/8" (28.9cm) x 10-3/8" (26.4cm) water area
- 1.6 gpf (6 lpf)
- With bedpan lugs (-L)

CODES/STANDARDS APPLICABLE

Specified model meets or exceeds the following:

- ASME/ANSI A112.19.2M
- ASME/ANSI A112.19.6M
- Energy Policy Act of 1992 (EPACT)
- IAPMO/UPC
- CSA International B45
- States of Connecticut, Massachusetts, New York, & Texas. →
- Cities of Los Angeles, CA; and New York, N.Y.



COLORS/FINISHES

- 0 White
- Other Refer to Fixtures Price Book for additional colors

Accessories:

- 0 White
- Other Refer to Fixtures Price Book for additional colors

SPECIFIED MODEL:

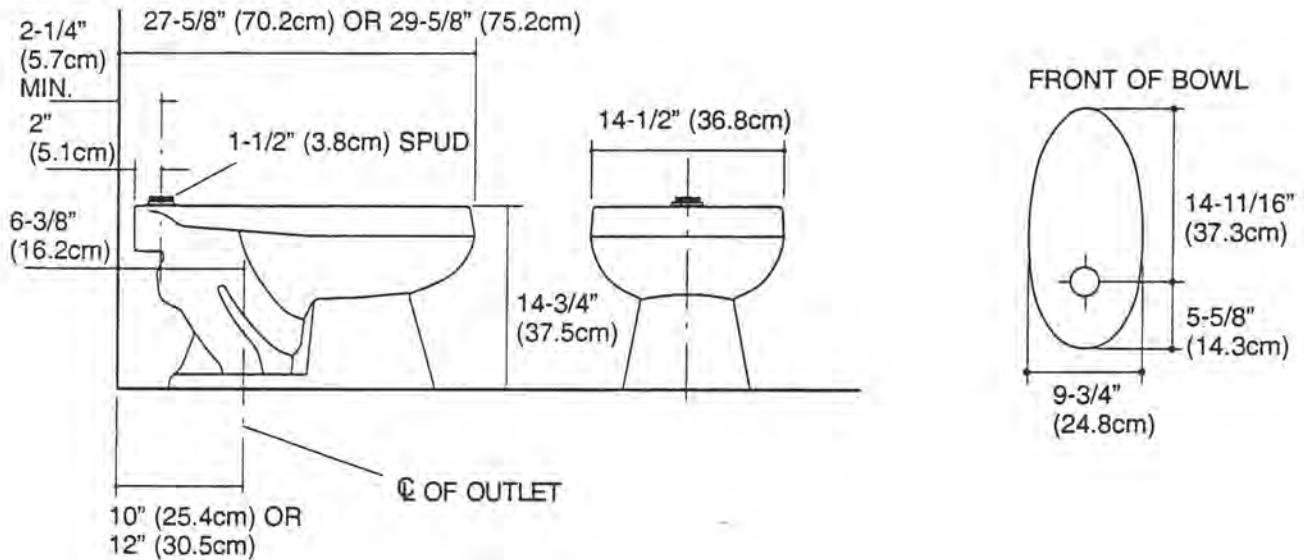
Model	Description	Colors/Finishes	
K-4350	Elongated bowl toilet	<input checked="" type="checkbox"/> 0 White	<input type="checkbox"/> Other _____
K-4350-L	Elongated bowl toilet with bedpan lugs	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other _____
Recommended Accessories			
K-4670-C	Lustra™ open front seat	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other _____
K-4670-CA	Lustra™ open front seat (with anti-microbial agent)	<input type="checkbox"/> 0 White	

PRODUCT SPECIFICATION:

The elongated bowl shall be capable of either 10" (25.4cm) or 12" (30.5cm) rough-in with 1-1/2" (3.8cm) top spud. Bowl shall be made of vitreous china. Bowl shall be 1.6 gpf (6 lpf). Bowl shall have 2-1/4" (5.7cm) passageway. Bowl shall have 11-3/8" (28.9cm) x 10-3/8" (26.4cm) water area. Bowl shall have bedpan lugs (-L). Bowl shall be Kohler Model K-4350-_____.

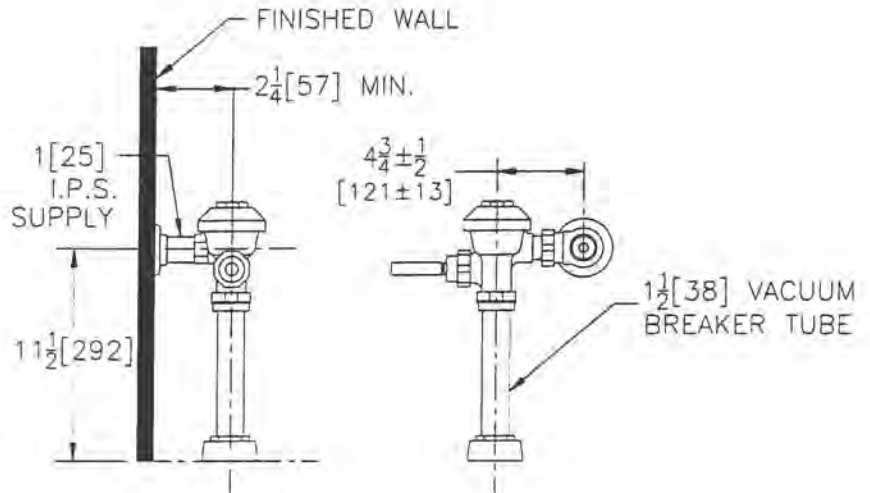
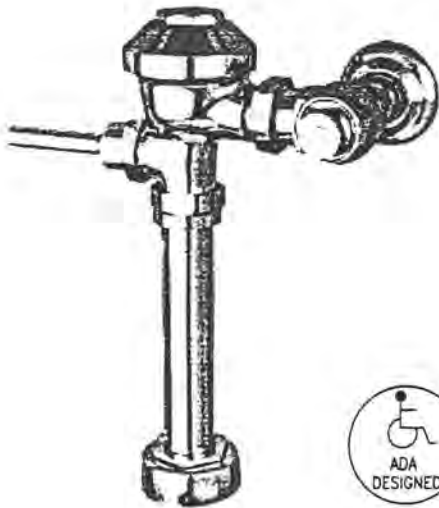
PRODUCT INFORMATION

Fixture:	
Configuration	Top spud, elongated
Water per flush	1.6 gallons* (6L)
Spud size	1-1/2" (3.8cm)
Passageway	2-1/4" (5.7cm)
Water area	11-3/8" (28.9cm) x 10-3/8" (26.4cm)
Water depth from rim	6" (15.2cm)
Seat post hole centers	5-1/2" (14cm)
* Designed to flush with 1.6 gallons (6L) of water when installed with a 1.6 gallon (6L) flush valve.	
Included Components:	
Spud	18357
Bolt caps (pr.)	52048
Flush valve requirements: For 12" (30.5cm) rough-in, sweat extension nipple is required. Refer to manufacturer and local codes.	



PRODUCT DIAGRAM

Exposed Z6000 Model for Water Closets



Flow Options

- WS1 1.6 Gal. Low Consumption Flush
- FF 4.5 Gal. Full Flush
- Standard Flush 3.5 Gallons Per Flush

Suffix Options (Check/Specify Appropriate Options)

- BG BioCare Handle
- H Handle on Front of Flush Valve
- L 1" [25] Metal Push Button
- L3 3" [76] Metal Push Button
- VC Vandal Resistant Stop Cover
- YB Sweat Solder Kit
- YC Cast Wall Flange
- YJ Split Ring Pipe Support
- YK Solid Ring Pipe Support
- YO Bumper on Angle Stop
- Other

ENGINEERING SPECIFICATION: ZURN Z6000 Aquaflush Exposed Closet Flush Valve - Exposed, quiet diaphragm-type, chrome plated flushometer valve with a polished exterior. Complete with a chloramine resistant, dual seal diaphragm with a clog resistant by-pass. The valve is ADA compliant with a non-hold-open and no leak handle feature, high back pressure vacuum breaker, one piece hex coupling nut, adjustable tailpiece, spud coupling and flange for top spud connection. Control stop has internal siphon-guard protection. Internal seals are made of chloramine resistant materials.

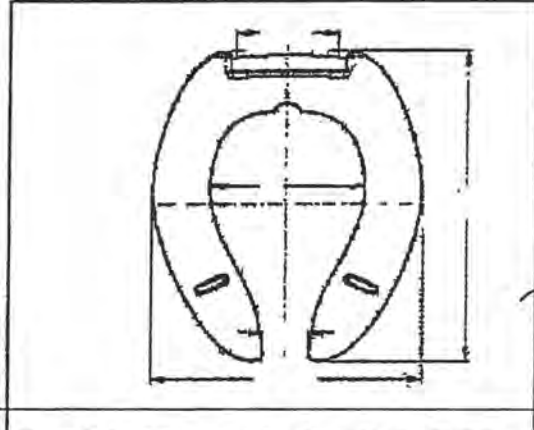
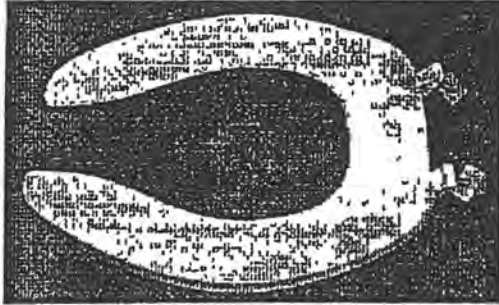
- Z6000PL - Aquaflush Plus is furnished as specified above and includes sweat solder kit, vandal resistant stop cap, and cast wall flange with set screw.

This space is for Architectural/engineering Approval

COMMERCIAL INSTITUTIONAL

Centoco

500 SERIES



~ 18 1/2" long
~ 3 1/4" wide

Model No. 500STS CC OPEN front less cover with stainless steel check hinge for elongated bowl.

Model No. 500STS CCSS OPEN front less cover with self sustaining stainless steel check hinge for elongated bowl.

Standard Features Includes: corrosion free stainless steel hinge posts. Integrally molded permanent and sanitary color keyed bumpers check hinge posts. Non-corrosive hardware. Impervious to cleansers and strong chemicals. Extended back with concealed hinge. Exclusive design and open back allow more thorough cleaning around hard to get areas

Specifications: Toilet seats shall be Centoco No. **1500S** Seat shall be injection molded of high strength, impact resistant thermoplastic with integrally molded permanent bumpers and stainless steel reinforced check hinges standard **TSCC**

WC-2 WATER CLOSET

WC-2 WATER CLOSET

KOHLER K4368 *HIGHCLIFF LT 12 RI BOWL

ZURN ZZ6000WS1 1.6 GAL CLOSET FLUSH VALVE

CENTOCO C1500STSCC001 EB BOWL SS HINGE OF CLST SEAT WHIT

FEATURES

- 10" (25.4cm) or 12" (30.5cm) rough-in
- 1-1/2" (3.8cm) top spud
- Vitreous china
- Elongated bowl
- 1.6 gpf (6 lpf)
- 2-1/4" (5.7cm) passageway
- 11-3/8" (28.9cm) x 10-3/8" (26.4cm) water area
- 17-1/2" (44.5cm) high bowl is ADA compliant
- With bedpan lugs (-L)

CODES/STANDARDS APPLICABLE

Specified model meets or exceeds the following:

- ADA
- ASME/ANSI A112.19.2M
- ASME/ANSI A112.19.6M
- CABO/ANSI A117.1
- Energy Policy Act of 1992 (EPACT)
- CSA International B45
- IAPMO/UPC
- States of Massachusetts, New York, & Texas
- City of Los Angeles, CA.



COLORS/FINISHES

- 0 White
- Other Refer to Fixtures Price Book for additional colors

Accessories:

- 0 White
- Other Refer to Fixtures Price Book for additional colors

SPECIFIED MODEL:

Model	Description	Colors/Finishes	
K-4368	Elongated bowl toilet	<input checked="" type="checkbox"/> 0 White	<input type="checkbox"/> Other _____
K-4368-L	Elongated bowl toilet with bedpan lugs	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other _____

Recommended Accessories

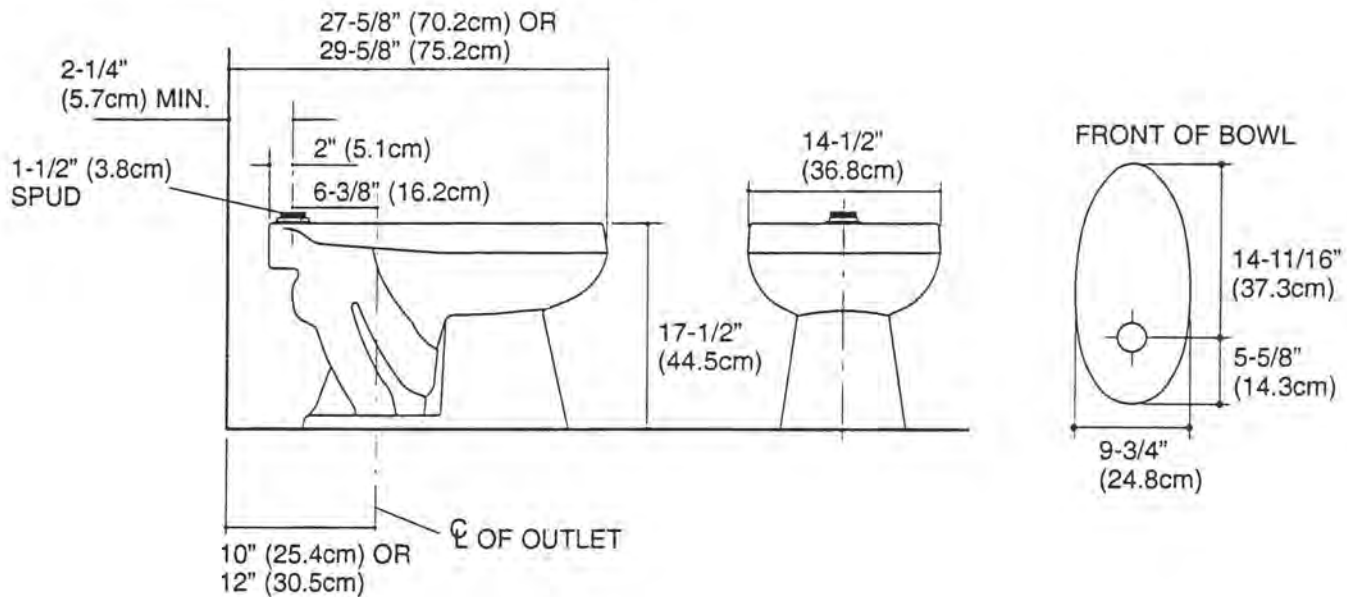
K-4670-C	Lustra™ open front seat	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other _____
K-4654	Lustra™ open front seat with support arms and cover	<input type="checkbox"/> 0 White	
K-4670-CA	Lustra™ open front seat (with anti-microbial agent)	<input type="checkbox"/> 0 White	
K-4654-A	Lustra™ open front seat with support arms and cover (with anti-microbial agent)	<input type="checkbox"/> 0 White	

PRODUCT SPECIFICATION:

The elongated bowl shall be 10" (25.4cm) or 12" (30.5cm) rough-in with 1-1/2" (3.8cm) top spud. Bowl shall be made of vitreous china. Bowl shall be 1.6 gpf (6 lpf). Bowl shall have 11-3/8" (28.9cm) x 10-3/8" (26.4cm) water area. Bowl shall have 2-1/4" (5.7cm) passageway. Bowl shall be ADA compliant with 17-1/2" (44.5cm) high bowl. Bowl shall have bedpan lugs (-L). Toilet shall be Kohler Model K-4368-_____.

PRODUCT INFORMATION

ADA compliant.	
Fixture:	
Configuration	Top spud, elongated
Water per flush	1.6 gallons* (6L)
Spud size	1-1/2" (3.8cm)
Passageway	2-1/4" (5.7cm)
Water area	11-3/8" (28.9cm) x 10-3/8" (26.4cm)
Water depth from rim	6" (15.2cm)
Seat post hole centers	5-1/2" (14cm)
* Designed to flush with gallons of water when installed with a 1.6 gallon (6L) flush valve.	
Included Components:	
Spud	18357
Bolt cap accessory pack	52048
Flush valve requirements: For 12" (30.5cm) rough-in, sweat extension nipple is required. Refer to manufacturer and local codes.	



PRODUCT DIAGRAM

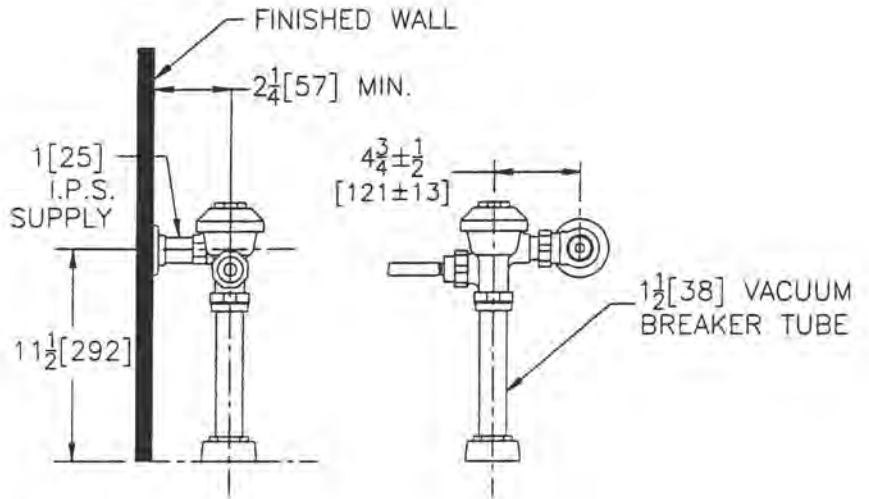
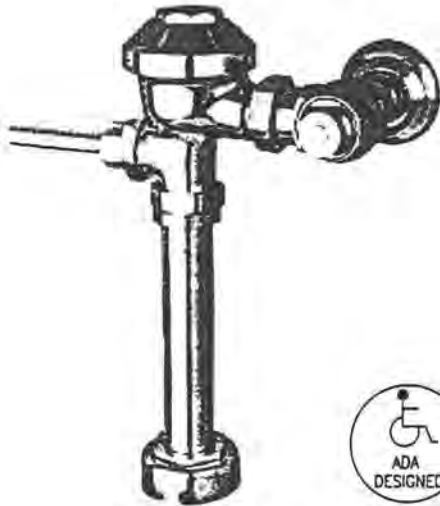


Aquaflush[®]

TAG WC-2

Exposed Z6000 Model for Water Closets

26000-WC1



Flow Options

- | | |
|--|--------------------------------|
| <input checked="" type="checkbox"/> -WS1 | 1.6 Gal. Low Consumption Flush |
| <input type="checkbox"/> -FF | 4.5 Gal. Full Flush |
| <input type="checkbox"/> Standard Flush | 3.5 Gallons Per Flush |

Suffix Options (Check/Specify Appropriate Options)

- | | |
|---|--------------------------------|
| <input type="checkbox"/> -BG | BioCare Handle |
| <input type="checkbox"/> -H | Handle on Front of Flush Valve |
| <input type="checkbox"/> -L | 1" [25] Metal Push Button |
| <input type="checkbox"/> -L3 | 3" [76] Metal Push Button |
| <input type="checkbox"/> -VC | Vandal Resistant Stop Cover |
| <input checked="" type="checkbox"/> -YB | Sweat Solder Kit |
| <input checked="" type="checkbox"/> -YC | Cast Wall Flange |
| <input type="checkbox"/> -YJ | Split Ring Pipe Support |
| <input type="checkbox"/> -YK | Solid Ring Pipe Support |
| <input type="checkbox"/> -YO | Bumper on Angle Stop |
| <input type="checkbox"/> | Other |

ENGINEERING SPECIFICATION: ZURN Z6000 Aquaflush Exposed Closet Flush Valve - Exposed, quiet diaphragm-type, chrome plated flushometer valve with a polished exterior. Complete with a chloramine resistant, dual seal diaphragm with a clog resistant by-pass. The valve is ADA compliant with a non-hold-open and no leak handle feature, high back pressure vacuum breaker, one piece hex coupling nut, adjustable tailpiece, spud coupling and flange for top spud connection. Control stop has internal siphon-guard protection. Internal seals are made of chloramine resistant materials.

- Z6000PL - Aquaflush Plus is furnished as specified above and includes sweat solder kit, vandal resistant stop cap, and cast wall flange with set screw.

This space is for Architectural/engineering Approval

ZURN INDUSTRIES, INC. - COMMERCIAL BRASS OPERATION - 5900 ELWIN BUCHANAN DRIVE - SANFORD NC 27330

Phone: 1-800-997-3876 - Fax: 919-775-3541 - World Wide Web: www.zurn.com

In Canada: ZURN INDUSTRIES LIMITED - 3544 Nashua Drive - Mississauga, Ontario L4V1L2 - Phone: 905-405-8272 Fax: 905-405-1292

Search

GO



Air Delights



Call Toll Free 1-800-440-5556

Air Neutralizers - Restroom - Plumbing Products

Home Contact Us Catalog Request Your Cart Check Out

Air Fresheners

- Select Aerosol
- Pulse IT Aerosol
- Microburst 3000
- Microburst 9000
- MeterMist
- Pump Systems
- Gel Systems
- TCell

Bathroom Products

- Automatic Flushers
- Automatic Faucets
- Manual Faucets
- Soap Dispensers
- Hand Sanitizers
- Hand Dryers
- Towel Dispensers
- Tissue Dispensers
- Shower Heads
- Water Heaters
- WaterFree Urinals
- Flush Valves
- Sloan Fixtures
- Bobrick Grab Bars
- AutoClean / Janitor
- Paper Products
- Tampon Dispenser
- Urinal Screens
- Partitions & Lockers
- Restroom Signs

Repair Parts

- Sloan Repair Parts
- Flushmate Parts
- Zurn Repair Parts
- T&S Brass Products
- Chicago Faucet

Other Products

- Trash Can Liners
- Floor Mats
- Wilkins Water Control
- Zurn Drains

Customer Service

- Catalog request
- Track Your Order
- Credit Application
- MSDS Information
- Company Info
- Contact Us
- Return Policy
- Newsletter

The OneShot Automatic Hand Soap Dispenser

Aquaflush Z6000 Series

(click here for parts breakdown)

Covers and Repair Kits	Product No.	Price	Qty
Outside Cover - CP - Item 10	P6000-LL	\$19.99	0
Inside Cover - Item 11	P6000-L	\$4.40	0
Low Consumption Closet Kit - 1.6 gal. flush	P6000-ECR-WS1	\$13.99	0
Water Saving Closet Kit - 3.5 gal. flush	P6000-ECR-WS	\$13.99	0
Full Flow Closet Kit - 4.5 gal. flush	P6000-ECR-FF	\$13.99	0
Low Consumption Urinal Kit - 1.0 gal. flush	P6000-EUR-WS1	\$13.99	0
Water Saving Urinal Kit - 1.5 gal. flush	P6000-EUR-WS	\$13.99	0
Full Flow Urinal Kit - 3.0 gal. flush	P6000-EUR-FF	\$13.99	0
Repair Parts - Inside Parts	Product No.	Price	Qty
Urinal Relief Valve - Item 12	P6000-EU13	\$4.99	0
Closet Relief Valve - Item 12	P6000-EC13	\$5.31	0
Aquaflush Rebuild Kits	Product No.	Price	Qty
Closet and Urinal Rebuild Kits Include	P6000-ECR-WS-RK	\$19.99	0
Items 4-9, 12, 13, 15-17, 26	P6000-ECR-WS1-RK	\$19.99	0
	P6000-EUR-WS-RK	\$17.99	0
	P6000-EUR-WS1-RK	\$17.99	0
Handle Assembly and Repair Kits	Product No.	Price	Qty
ADA Handle Assembly (Side) Includes Items 2-9	P6000-M-ADA	\$13.49	0
Handle Repair Kit (Side) Includes Items 4-9	P6000-MK	\$3.60	0
Handle Seal Includes Item 8	P6000-M9	\$0.90	0
Handle Gasket Includes Item 9	P6000-M10	\$0.50	0
Repair Kit for Front Operation - Exposed Includes Items 4-9	P6000-MHK	\$4.59	0
Handle Assembly (Front) Includes Items 2-9	P6000-MH	\$14.99	0
Control Stop Repair Kit and Parts	Product No.	Price	Qty
Control Stop Repair Kit for 1" and 3/4" Includes Items 30-36	P6000-D-SD	\$4.99	0
Seal Seat for 1" and 3/4", Includes Item 30	P6000-D42	\$1.64	0
VP Control Stop Repair Kit for 1" and 3/4"	P6000-D-VP	\$11.97	0
Sweat Solder Connection with Cast Wall Flange	P6000-YB	\$8.37	0
Adjustable Tailpieces	Product No.	Price	Qty
Adjustable Tailpiece for Standard Flush Valve Includes Items 24-26	P6000-J1	\$11.99	0



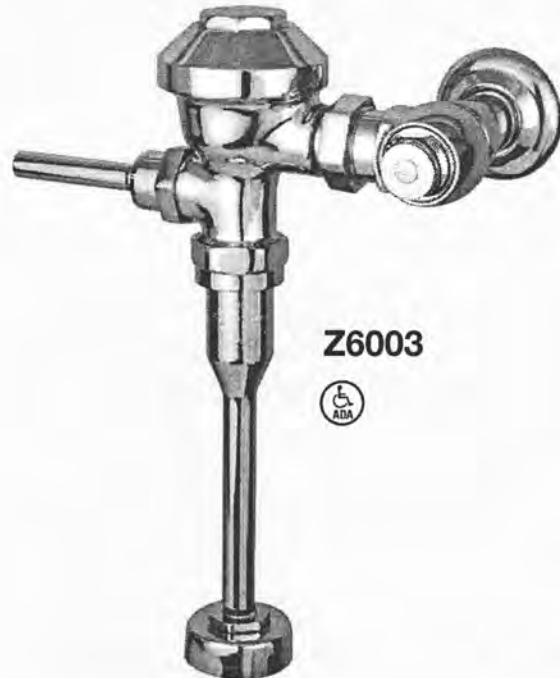
Aquaflush Z6000 Series

Aquaflush Exposed Flushometer
Installation, Operation,
Maintenance, and Parts Manual

Patented and Patents Pending



Z6000



Z6003



Aquaflush Exposed Closet/Urinal Systems

- Z6000
- Z6001
- Z6003
- Z6010
- Z6014
- Z6017
- Z6096
- Z6099

Aquaflush
Flush Valves

LIMITED WARRANTY

All goods sold hereunder are warranted to be free from defects in material and factory workmanship for a period of three years from the date of purchase. Decorative finishes warranted for one year. We will replace at no cost goods that prove defective provided we are notified in writing of such defect and the goods are returned to us prepaid at Sanford, NC, with evidence that they have been properly maintained and used in accordance with instructions. We shall not be responsible for any labor charges or any loss, injury or damages whatsoever, including incidental or consequential damages. The sole and exclusive remedy shall be limited to the replacement of the defective goods. Before installation and use, the purchaser shall determine the suitability of the product for his intended use and the purchaser assumes all risk and liability whatever in connection therewith. Where permitted by law, the implied warranty of merchantability is expressly excluded. If the products sold hereunder are "consumer products," the implied warranty of merchantability is limited to a period of three years and shall be limited solely to the replacement of the defective goods. All weights stated in our catalogs and lists are approximate and are not guaranteed.



Aquaflush Rough-In, Product Specification, Models and Options

ENGINEERING SPECIFICATION: ZURN Aquaflush Exposed Closet Flush Valve – Exposed, quiet diaphragm-type, chrome-plated flushometer valve with a polished exterior. Complete with a chloramine resistant, dual seal diaphragm with a clog resistant by-pass. The valve is ADA compliant with a non-hold open and no leak handle feature, high back pressure vacuum breaker, one-piece hex coupling nut, adjustable tailpiece, spud coupling, and flange for top spud connection. Control stop has internal siphon-guard protection. Internal seals are made of chloramine resistant materials.

Z6000PL Aquaflush Plus is furnished as specified above and includes sweat solder kit, vandal-resistant stop cap, and cast wall flange with setscrew.

MODELS

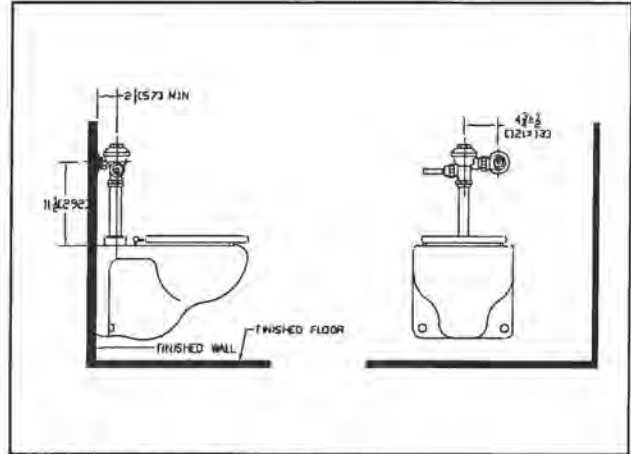
- Z6000 – 1-1/2" Water Closet valve with top spud connection.
- Z6010 – 1-1/2" Water Closet valve with back spud connection.
- Z6001 – 1-1/4" Urinal Valve with top spud connection.
- Z6003 – 3/4" Urinal Valve with top spud connection.

FLOWS

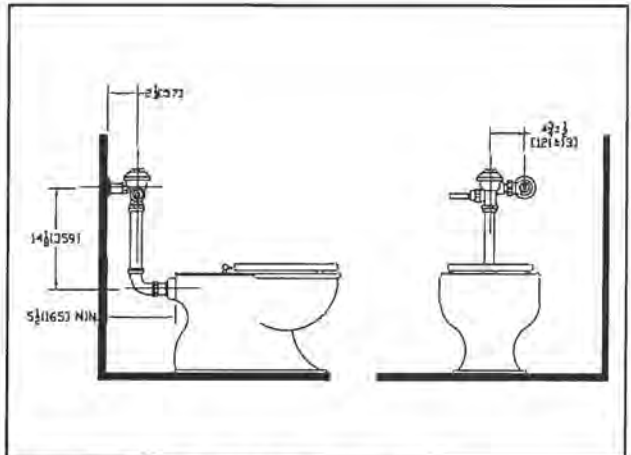
- WS1 Low Consumption
1.0 Gal. for Urinal, 1.6 Gal. for Water Closet
- WS 1.5 Gal. for Urinal, 3.5 Gal. for Water Closet
- FF Full Flow
3.0 Gal. for Urinal, 4.5 Gal. for Water Closet

OPTIONS

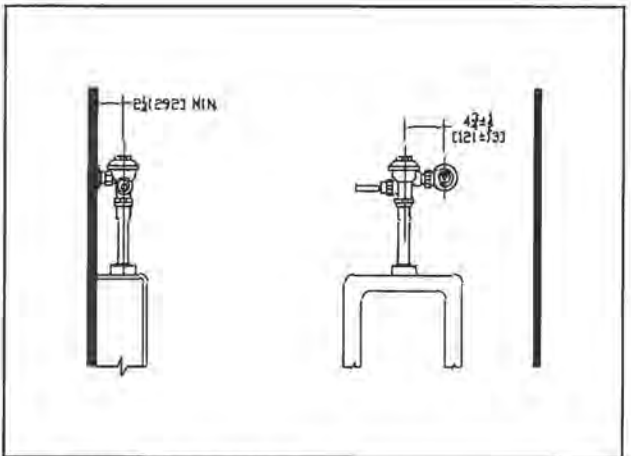
- ___ -BG BioCare Handle
- ___ -H Handle on Front of Flush Valve
- ___ -L 1" [25] Metal Push Button
- ___ -L3 3" [76] Metal Push Button
- ___ -VC Vandal-Resistant Stop Cover
- ___ -YB Sweat Solder Kit
- ___ -YC Cast Wall Flange
- ___ -YJ Split Ring Pipe Support
- ___ -YK Solid Ring Pipe Support
- ___ -YO Bumper on Stop Valve



Models: Z6000, Z6000-1, Z6000-2, Z6000-3,
-WS1 (water saver) 1.6 Gal. Low Consumption



Models: Z6001 (1-1/4" urinal flush valve)
Z6003 (3/4" urinal flush valve)
-WS1 (water saver) 1.0 Gal. Low Consumption



Models: Z6010, Z6010-1, Z6010-2,
-WS1 (water saver) 1.6 Gal. Low Consumption

Aquaflush
Flush Valves

Sweat Solder Adaptor Installation Instructions



Important:

- All plumbing is to be installed according to state and local codes and regulations.
- Water supply lines need to allow proper water flow for each fixture.
- Flush all lines of any **debris** before making connections.
- Do not use pipe sealant or plumbing grease on any fitting other than the control stop inlet.

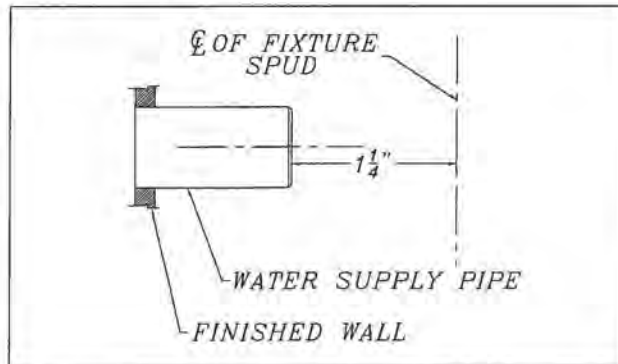
The Aquafush valve is designed to operate under various water pressures with a recommended range between 10 and 100 psi (69 to 689 kPa). Each Zurn valve is tested for proper performance at the factory before being shipped. Consult the product pages of the catalog for available flow options.

Most low consumption fixtures (1.6 gallon) require a minimum of 25 psi running pressure through the valve to obtain proper evacuation.

When installing your quality Zurn valve it is recommended that to protect the polished finish you do not use a toothed wrench. This will cause gouges and scratches on your valve.

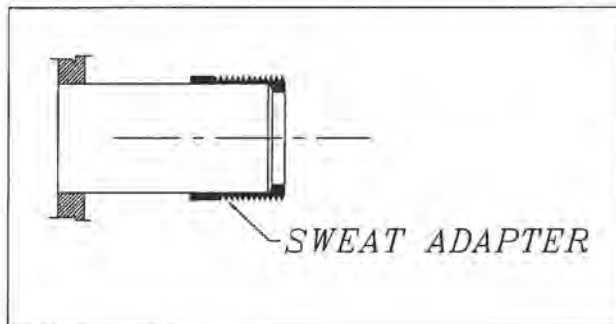
STEP NO. 1

Measure distance from finished wall to center line of fixture spud; cut water supply pipe 1-1/4" shorter than this measurement. Chamfer O.D. and I.D.



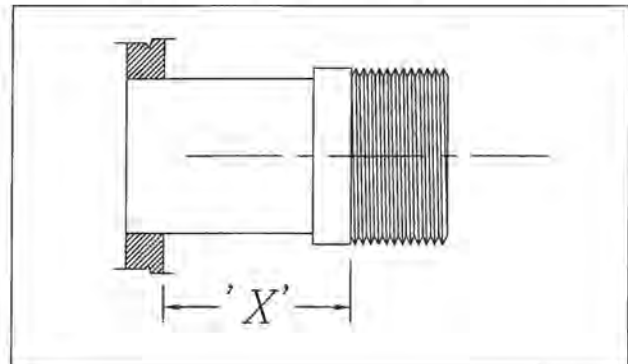
STEP NO. 2

Slide threaded adaptor onto supply pipe until shoulder stops on end of pipe. Then sweat-solder the adaptor to water supply pipe.



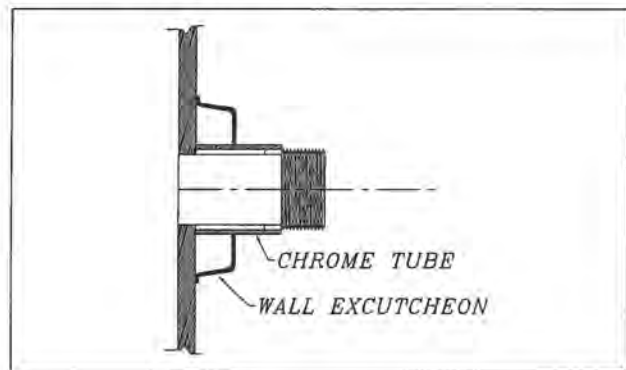
STEP NO. 3

Measure from finished wall to first thread of adaptor for length of chrome tube. Cut chrome tube this length 'x'.



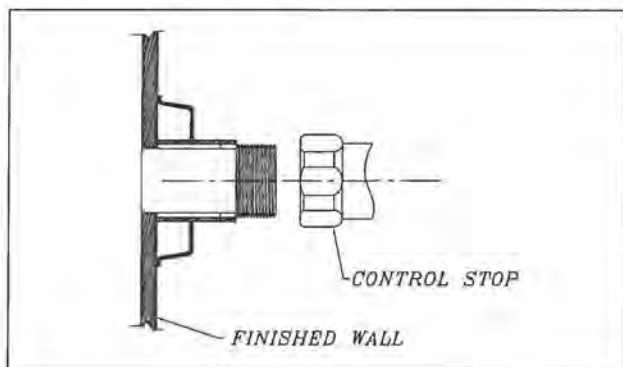
STEP NO. 4

Slide wall escutcheon over chrome tube and slide both chrome tube and wall escutcheon over supply pipe pushing the wall escutcheon all the way to the wall.



STEP NO. 5

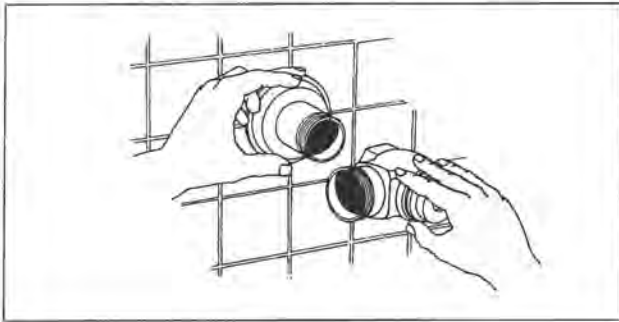
Screw control stop onto water supply water adaptor.



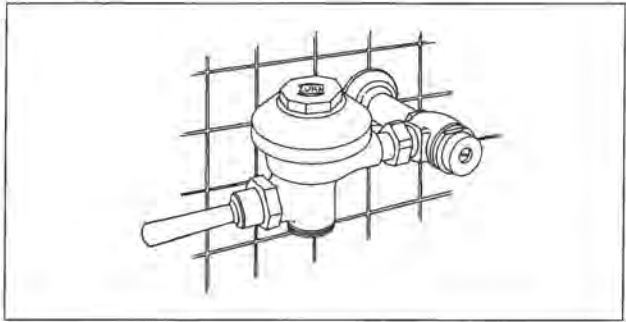


Aquaflush Installation Instructions

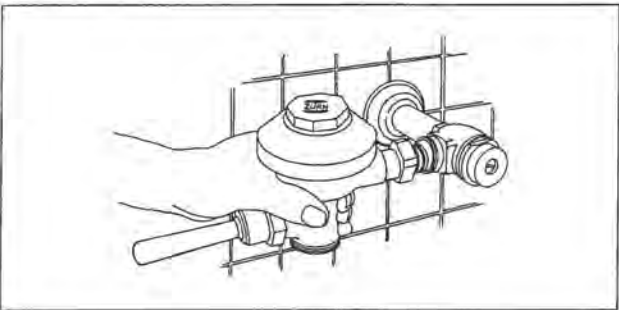
1. Install stop valve assembly using proper size supply escutcheon and sweat solder adapter kit if applicable (see 1). Thread sealing compounds should be used on male NPT threads only.



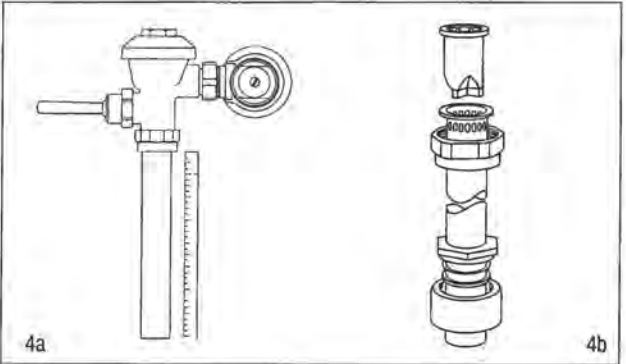
3. Insert the flush valve tailpiece into the stop valve and hand tighten the lock nut to the stop valve. Plumb the entire unit (see 3).



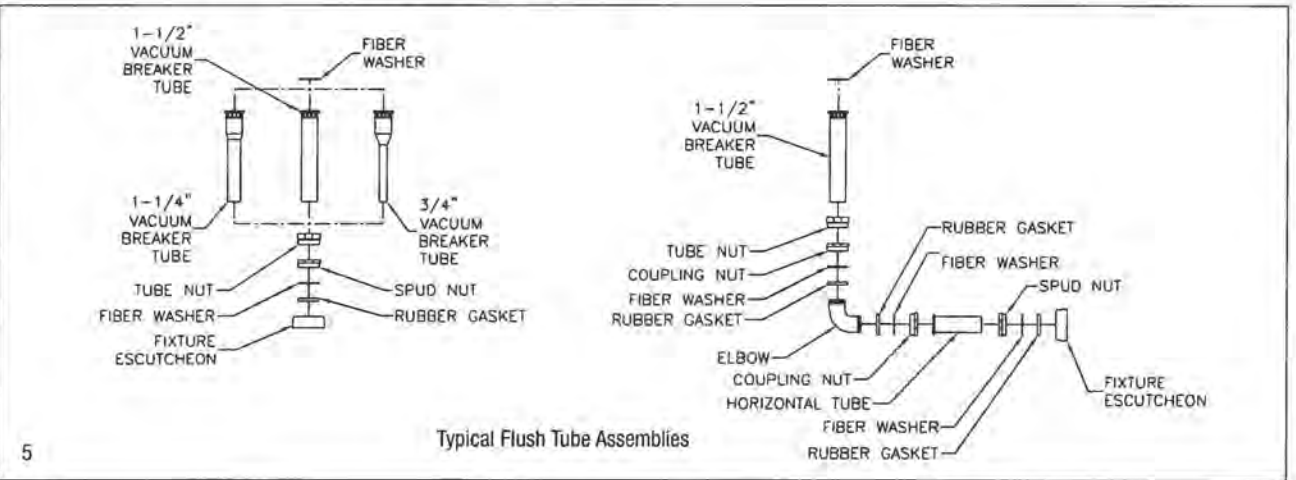
2. Prior to inserting the flush valve tailpiece into stop valve, be certain that the O-ring seal is located in O-ring seal groove at the end of the tailpiece and the locking nut and locking snap ring are located as shown below (see 2). Care should be taken not to damage the O-ring when inserting the tailpiece into the stop valve. If lubrication is needed, wetting the O-ring with water will be sufficient.



4. Determine the length of vacuum breaker tube required to join the flush valve and fixture spud. Cut the vacuum breaker tube, if required, to this length (see 4a). Assemble the vacuum breaker tube assembly and spud nut assembly to the flush valve and fixture spud (see 4b).



5. Hand tighten spud nut and vacuum breaker tube nut to fixture and flush valve. Adjust the valve assembly for plumb. Tighten fixture spud nut, vacuum breaker tube nut and lock nut with a wrench.

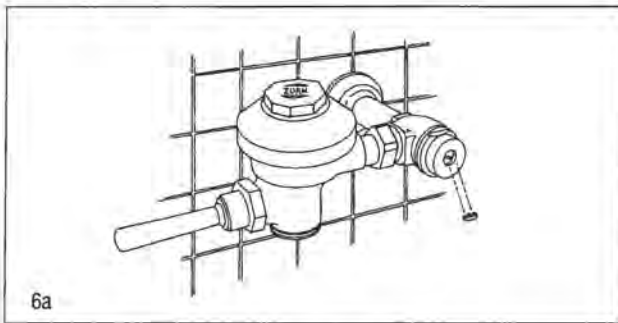


Aquaflush
Flush Valves

Aquaflush Installation Instructions

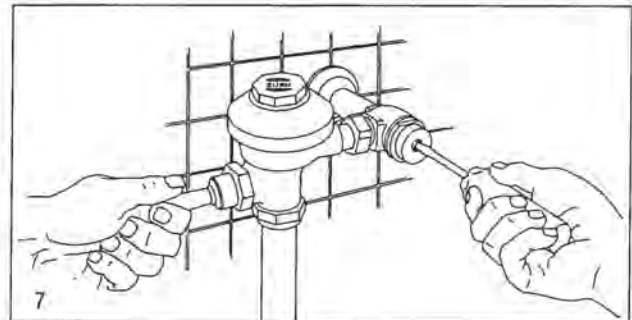


6. When all flush valves are connected to the fixtures and water pressure is available, it is recommended that the supply piping be flushed to remove dirt, pipe chips, etc. from system. Before the water is turned on, be sure all stop valves to the flush valves are closed off tight. The stop valves can be opened and closed by using the adjusting screw located at the center of the stop valve cap, behind the stop snap cap screw cover if already installed (see 6a). Stop valve adjustments can only be made by using the adjusting screw. **It is not necessary to remove the stop valve cap when making adjustments. If for any reason it becomes necessary to remove the stop valve cap, be certain the water is shut off at the main supply valve.**



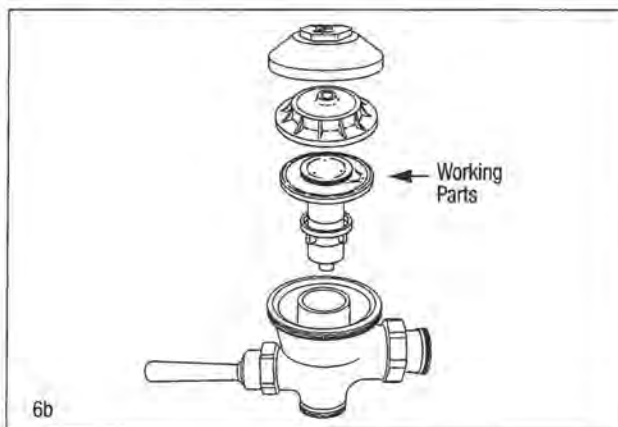
This procedure should also be followed when the system has been drained for some time, as occurs in athletic fields, recreation parks, etc.

7. The Aquaflush flush valves are preset for fixture volume as marked on the valve cartons. The valve does not require regulation for variation in water pressure within its operating range. To set the flush valve for proper operation, gradually adjust the stop valve open, using the adjusting screw, while actuating the valve until the rate of water flow into the fixture is not excessive, yet is sufficient enough to adequately evacuate the waste. The final setting for urinals should be such that the fixture will not overflow when the valve is actuated in succession. The stop snap cap screw should be secured after final adjustments have been made.



Use the following procedure to flush out the supply piping:

- A. Remove the main valve body cover.
- B. Remove the working parts from the flush valve (shown in 6b).
- C. Replace the main valve body cover and plastic cover without reinstalling the working parts.
- D. Open the stop valve by using the stop adjusting screw, and flush out all debris from pipe and connections.
- E. Shut stop, open cover, replace the working parts, replace plastic cover and main valve body cover and tighten.



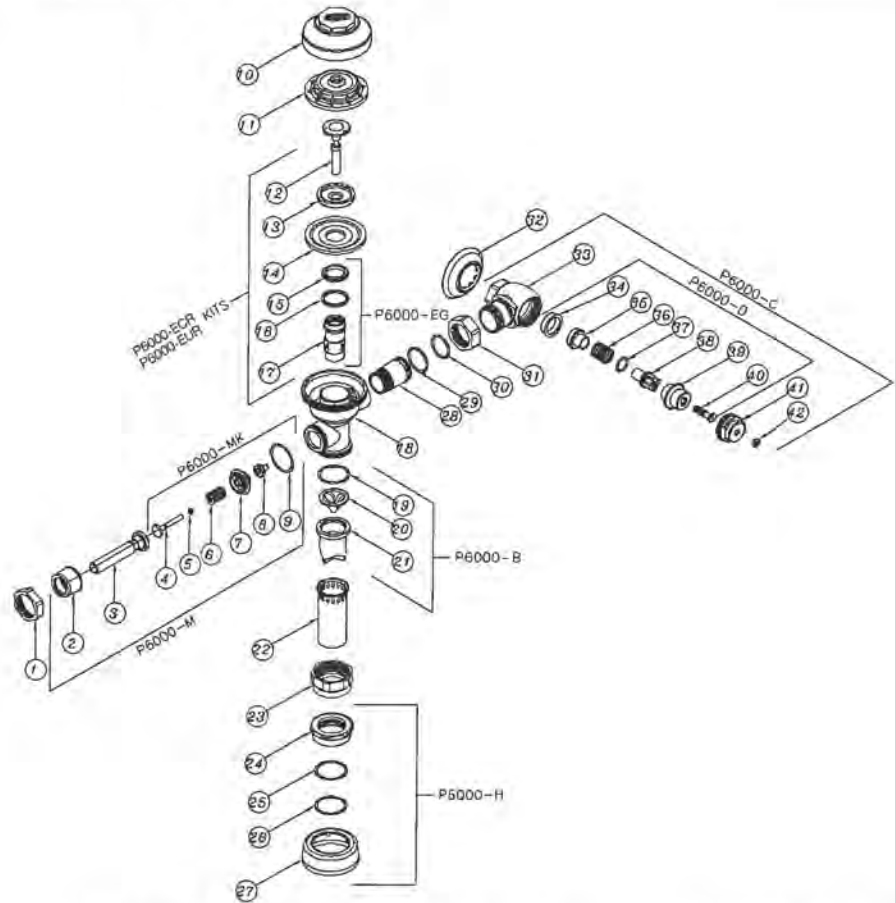
Aquaflush
Flush Valves



Aquaflush Exposed Repair Kits

Parts Identification

1. Handle Nut
2. Handle Sleeve and Insert
3. Low Force/ADA Compliant Handle
4. Actuator Rod
5. Handle O-Ring
6. Handle Spring
7. Handle Seal Retainer
8. Handle Seal
9. Gasket
10. Valve Body Cover
11. Plastic Cover
12. Trip Mechanism
13. Retainer Disc
14. Diaphragm
15. Flow Ring
16. Guide Ring
17. Cylinder Slide
18. Valve Body
19. Vacuum Breaker Friction Washer
20. Vacuum Breaker Insert
21. Vacuum Breaker Duckbill
22. Vacuum Breaker Tube
23. Vacuum Breaker Tube Nut
24. Spud Nut
25. Spud Friction Washer
26. Spud Sleeve
27. Spud Escutcheon
28. Tailpiece
29. Snap Ring
30. Tailpiece O-Ring
31. Locking Nut
32. Setscrew for Cast Wall Flange
33. Stop Body
34. Piston Seal
35. Piston
36. Stop Spring
37. Guide O-Ring
38. Piston Guide
39. Guide Holder
40. Adjusting Screw
41. Stop Cap
42. Snap Cap Screw Cover



Covers and Repair Kits	Product No.
Outside Cover - CP - Item 10	P6000-LL
Inside Cover - Item 11	P6000-L
Low Consumption Closet Kit - 1.6 gal. flush	P6000-ECR-WS1
Water Saving Closet Kit - 3.5 gal. flush	P6000-ECR-WS
Full Flow Closet Kit - 4.5 gal. flush	P6000-ECR-FF
Low Consumption Urinal Kit - 1.0 gal. flush	P6000-EUR-WS1
Water Saving Urinal Kit - 1.5 gal. flush	P6000-EUR-WS
Full Flow Urinal Kit - 3.0 gal. flush	P6000-EUR-FF

Repair Parts - Inside Parts	Product No.
Urinal Relief Valve - Item 12	P6000-EU13
Closet Relief Valve - Item 12	P6000-EC13

Aquaflush Rebuild Kits	Product No.
Closet and Urinal Rebuild Kits Include Items 4-9, 12, 13, 15-17, 26	P6000-ECR-WS-RK P6000-ECR-WS1-RK P6000-EUR-WS-RK P6000-EUR-WS1-RK

Handle Assembly and Repair Kits	Product No.
ADA Handle Assembly (Side) Includes Items 2-9	P6000-M-ADA
Handle Repair Kit (Side) Includes Items 4-9	P6000-MK
Handle Seal Includes Item 8	P6000-M9
Handle Gasket Includes Item 9	P6000-M10
Repair Kit for Front Operation - Exposed Includes Items 4-9	P6000-MHK
Handle Assembly (Front) Includes Items 2-9	P6000-MH

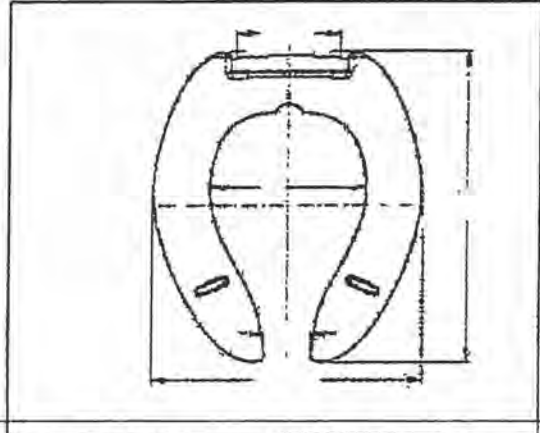
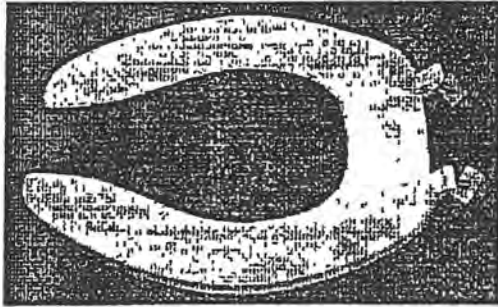
Control Stop Repair Kit and Parts	Product No.
Control Stop Repair Kit for 1" and 3/4"	P6000-D-SD
Includes Items 30-36	
Seal Seat for 1" and 3/4", Includes Item 30	P6000-D42
VP Control Stop Repair Kit for 1" and 3/4"	P6000-D-VP
Sweat Solder Connection with Cast Wall Flange	P6000-YB

Adjustable Tailpieces	Product No.
Adjustable Tailpiece for Standard Flush Valve Includes Items 24-26	P6000-J1
Tailpiece Coupling Assembly Includes Items 25-27	P6000-K
Tailpiece Locking Ring Includes Item 25	P6000-C30
Tailpiece O-Ring Includes Item 26	P6000-C31
Coupling Nut Includes Item 27	P6000-C32

Flush Connections and Spud Coupling Kits	Product No.
Flush Tube Assembly for Flush Valves Includes Items 15-19. Specify diameter and length.	P6000-A
Vacuum Breaker Repair Kit Includes Items 15-17	P6000-B
Spud Coupling Assembly Includes Items 20-23. Specify size.	P6000-H

Aquaflush
Flush Valves

COMMERCIAL INSTITUTIONAL

Centoco**500 SERIES**

Model No. 500STS CC OPEN front less cover with stainless steel check hinge for elongated bowl.

Model No. 500STS CCSS OPEN front less cover with self sustaining stainless steel check hinge for elongated bowl.

Standard Features Includes: corrosion free stainless steel hinge posts. Integrally molded permanent and sanitary color keyed bumpers check hinge posts. Non-corrosive hardware. Impervious to cleansers and strong chemicals. Extended back with concealed hinge. Exclusive design and open back allow more thorough cleaning around hard to get areas

Specifications: Toilet seats shall be Centoco No. _____ Seat shall be injection molded of high strength, impact resistant thermoplastic with integrally molded permanent bumpers and stainless steel reinforced check hinges standard

1500STSCC

→ **K-4321**

ADA



FEATURES

- 10" rough-in
- 1-1/2" top spud
- Vitreous china
- 12-3/8" x 10-1/8" water area
- Elongated bowl
- 1.6 gpf
- Includes K-4686 toilet seat with scalloped handhold locations for children
- Available with white, primary yellow, primary red, or primary blue colored seats

CODES/STANDARDS APPLICABLE

Specified model meets or exceeds the following:

- ADA-Children's Environment
- ASME/ANSI A112.19.2M
- ASME/ANSI A112.19.6M
- CABO/ANSI A117.1
- IAPMO/UPC
- Energy Policy Act of 1992 (EPACT)
- Canadian Standards Association (CSA)
- States of Massachusetts, New York, & Texas
- City of Los Angeles, CA

COLORS/FINISHES

- 0 White toilet with white seat
- R White toilet with red seat
- B White toilet with blue seat
- Y White toilet with yellow seat

SPECIFIED MODEL:

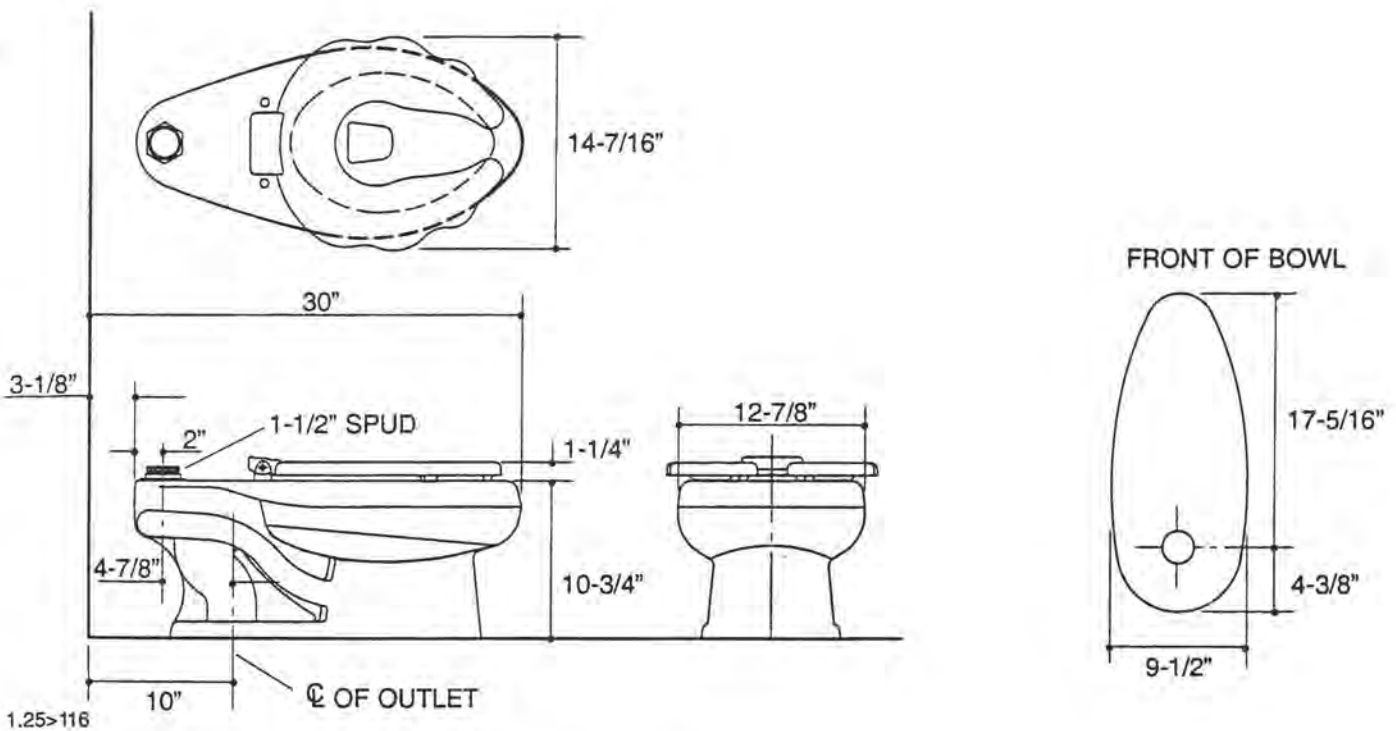
Model	Description	Colors/Finishes	
K-4321	Elongated bowl toilet	<input checked="" type="checkbox"/> White	<input type="checkbox"/> Other _____

PRODUCT SPECIFICATION:

The elongated bowl shall be 10" rough-in with 1-1/2" top spud. Bowl shall be made of vitreous china. Bowl shall have 12-3/8" x 10-1/8" water area. Bowl shall be 1.6 gpf. Bowl shall include K-4686 toilet seat with scalloped handhold locations for children. Bowl shall have a choice of white, primary yellow, primary red or primary blue colored seat. Bowl shall be Kohler Model K-4321-_____.

PRODUCT INFORMATION

Fixture:	
Configuration	Top spud elongated
Gallons per flush	1.6 gallons*
Spud size	1-1/2"
Passageway	2-1/8"
Water area	12-3/8" x 10-1/8"
Water depth from rim	4-1/4"
Seat post hole centers	5-1/2"
* Designed to flush with 1.6 gallons of water when installed with a 1.6 gpf flush valve.	
Included Components:	
Spud	18357
Seat	K-4686-A
Bolt cap accessory pack	52048
Flush valve requirements: Refer to manufacturer and local codes.	



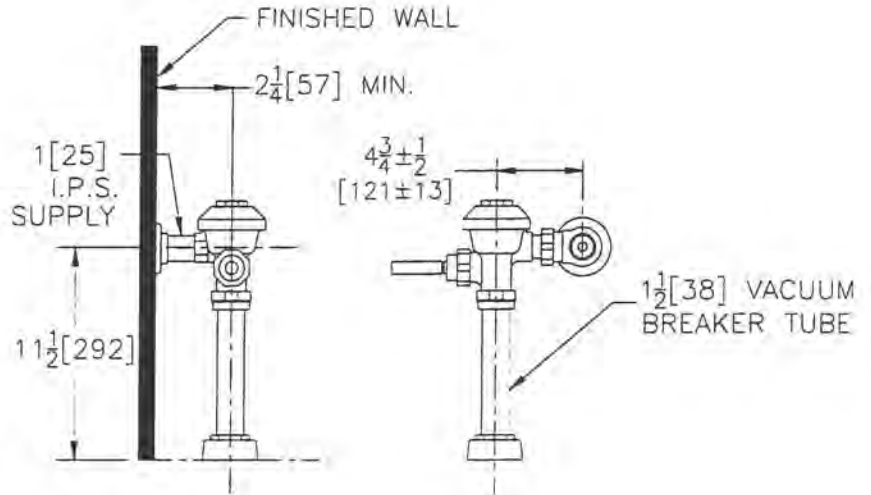
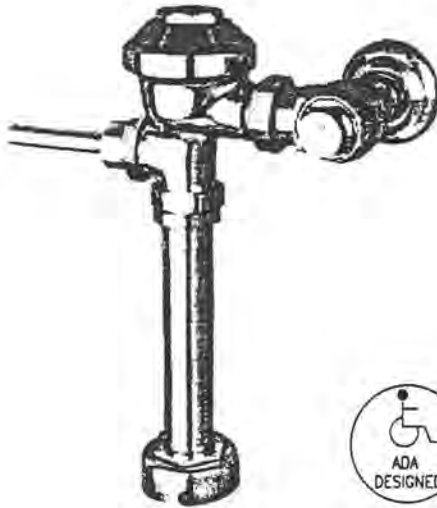
PRODUCT DIAGRAM



Aquaflush[®]

TAG WC-3

Exposed Z6000 Model for Water Closets



Flow Options

- WS1 1.6 Gal. Low Consumption Flush
- FF 4.5 Gal. Full Flush
- Standard Flush 3.5 Gallons Per Flush

Suffix Options (Check/Specify Appropriate Options)

- BG BioCare Handle
- H Handle on Front of Flush Valve
- L 1" [25] Metal Push Button
- L3 3" [76] Metal Push Button
- VC Vandal Resistant Stop Cover
- YB Sweat Solder Kit
- YC Cast Wall Flange
- YJ Split Ring Pipe Support
- YK Solid Ring Pipe Support
- YO Bumper on Angle Stop
- Other

ENGINEERING SPECIFICATION: ZURN Z6000 Aquaflush Exposed Closet Flush Valve - Exposed, quiet diaphragm-type, chrome plated flushometer valve with a polished exterior. Complete with a chloramine resistant, dual seal diaphragm with a clog resistant by-pass. The valve is ADA compliant with a non-hold-open and no leak handle feature, high back pressure vacuum breaker, one piece hex coupling nut, adjustable tailpiece, spud coupling and flange for top spud connection. Control stop has internal siphon-guard protection. Internal seals are made of chloramine resistant materials.

- Z6000PL - Aquaflush Plus is furnished as specified above and includes sweat solder kit, vandal resistant stop cap, and cast wall flange with set screw.

This space is for Architectural/engineering Approval

ZURN INDUSTRIES, INC. * COMMERCIAL BRASS OPERATION * 5900 ELWIN BUCHANAN DRIVE * SANFORD NC 27330

Phone: 1-800-997-3876 * Fax: 919-775-3541 * World Wide Web: www.zurn.com

In Canada: ZURN INDUSTRIES LIMITED * 3544 Nashua Drive * Mississauga, Ontario L4V1L2 * Phone: 905-405-8272 Fax: 905-405-1292

C O M M E R C I A L S E A T S

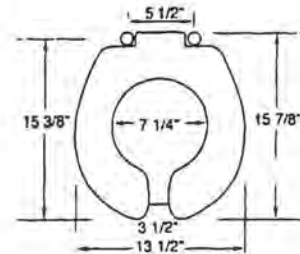
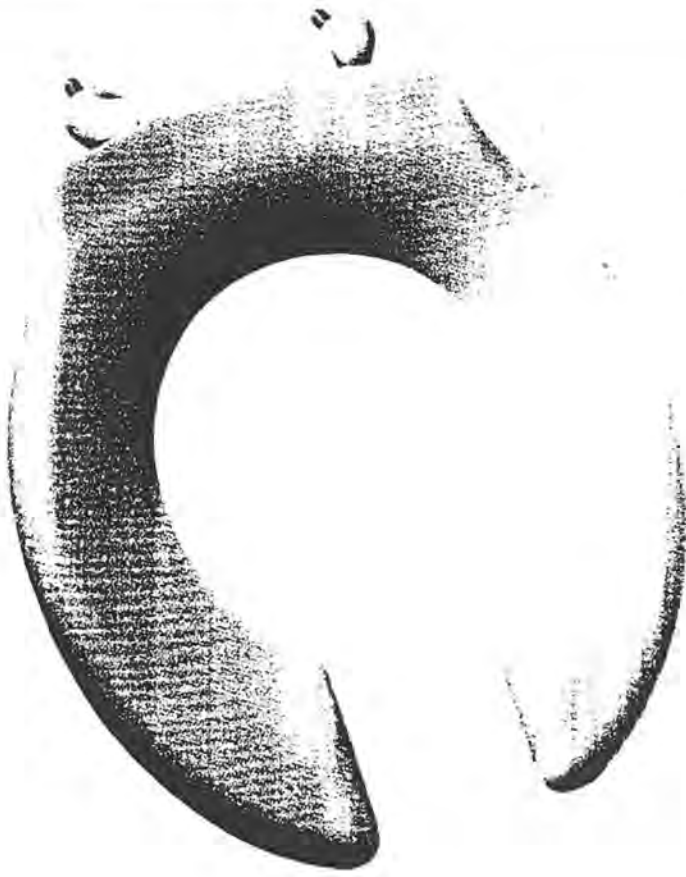


BB955C

SPECIFICATIONS

Seats shall be No. BB955C as manufactured by Bemis Manufacturing Co. Seats shall be open front less cover and injection molded of Duraloy™ solid plastic to fit baby bowls. Features molded-in bumpers and extended back design with external check hinge. Color to be white.

C. BB955C Fits baby bowls



Ring thickness is 3/4"
Ring thickness including the bumper is 1 1/4"
Height of the seat is 1 1/2"



EXTERNAL CHECK HINGE



Bemis Manufacturing Co., Sheboygan Falls, WI 53085 Phone: 800-558-7611 Fax: 414-467-8573

©1993 08701-2022



UR-1 URINAL

UR-1 URINAL

KOHLER K5016ETWH *DEXTER 1.0 TOP SPUD URINAL WHIT

ZURN ZZ6003AVWS1 1 GAL URN FLUSH VLV ADA

ZURN ZZ1221 Z-1221 URINAL SUPPORT SYSTEM

FEATURES

- Vitreous china
- Siphon jet
- 3/4" top spud
- 14-1/2" (36.8cm) extended rim
- Includes inlet & outlet spuds and hangers
- Includes anti-backsplash wall
- 1.0 gallon (3.78L) or less flush
- ADA compliant when rim is mounted no higher than 17" (43.2cm) from finished floor

→ **K-5016-ET**

ADA



CODES/STANDARDS APPLICABLE

Specified model meets or exceeds the following:

- ADA when rim is mounted no higher than 17" (43.2cm) from finished floor
- ASME/ANSI A112.19.2M
- ASME/ANSI A112.19.6M
- CABO/ANSI A117.1
- IAPMO/UPC
- Energy Policy Act of 1992 (EPACT)
- States of Massachusetts, New York, & Texas
- City of Los Angeles, CA

COLORS/FINISHES

- 0 White
- Other Refer to Fixtures Price Book for additional colors

SPECIFIED MODEL:

Model	Description	Colors/Finishes	
K-5016-ET	3/4" top spud urinal	<input checked="" type="checkbox"/> White	<input type="checkbox"/> Other _____

PRODUCT SPECIFICATION:

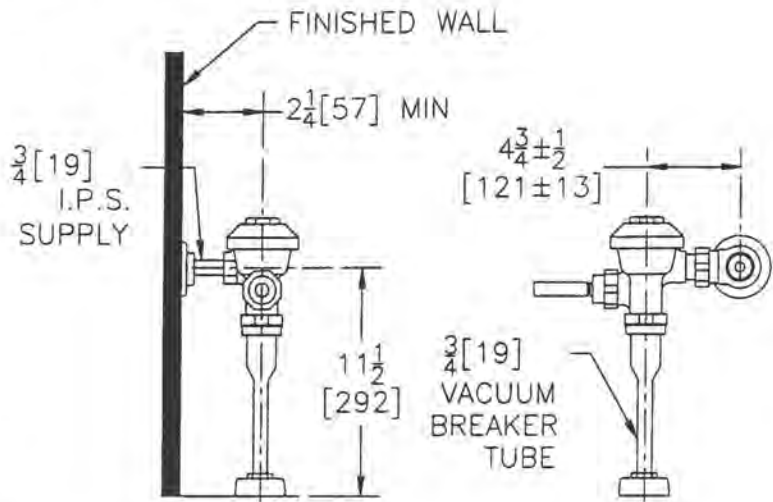
The siphon jet urinal shall be made of vitreous china with a 3/4" top spud. Urinal shall have 14-1/2" (36.8cm) extended rim. Urinal shall include inlet & outlet spuds and hangers. Urinal shall include anti-backsplash wall. Urinal shall be 1.0 gallon (3.78L) or less flush. Urinal shall be ADA compliant when rim is mounted no higher than 17" (43.2cm) from finished floor. Urinal shall be Kohler Model K-5016-ET-_____.



Aquaflush®

TAG UR-1

Exposed Z6003 Model for 3/4" Urinals



Flow Options

<input type="checkbox"/> -EWS	0.5 Gallons Per Flush
<input checked="" type="checkbox"/> -WS1	1.0 Gal. Low Consumption
<input type="checkbox"/> Standard Flush	1.5 Gallons Per Flush

Suffix Options (Check/Specify Appropriate Options)

<input type="checkbox"/> -BG	BioCare Handle
<input type="checkbox"/> -H	Handle on Front of Flush Valve
<input type="checkbox"/> -L	1" [25] Metal Push Button
<input type="checkbox"/> -L3	3" [76] Metal Push Button
<input type="checkbox"/> -VC	Vandal Resistant Stop Cover
<input checked="" type="checkbox"/> -YB	Sweat Solder Kit
<input checked="" type="checkbox"/> -YC	Cast Wall Flange
<input type="checkbox"/> -YJ	Split Ring Pipe Support
<input type="checkbox"/> -YK	Solid Ring Pipe Support
<input type="checkbox"/>	Other

ENGINEERING SPECIFICATION: ZURN Z6003 Aquaflush Exposed Urinal Flush Valve - Exposed, quiet diaphragm-type, chrome plated flushometer valve with a polished exterior. Complete with a chloramine resistant, dual seal diaphragm with a clog resistant by-pass. The valve is ADA compliant with a non-hold open and no leak handle feature, high back pressure vacuum breaker, one piece hex coupling nut, adjustable tailpiece, spud coupling and flange for top spud connection. Control stop has internal siphon-guard protection. Internal seals are made of chloramine resistant materials.

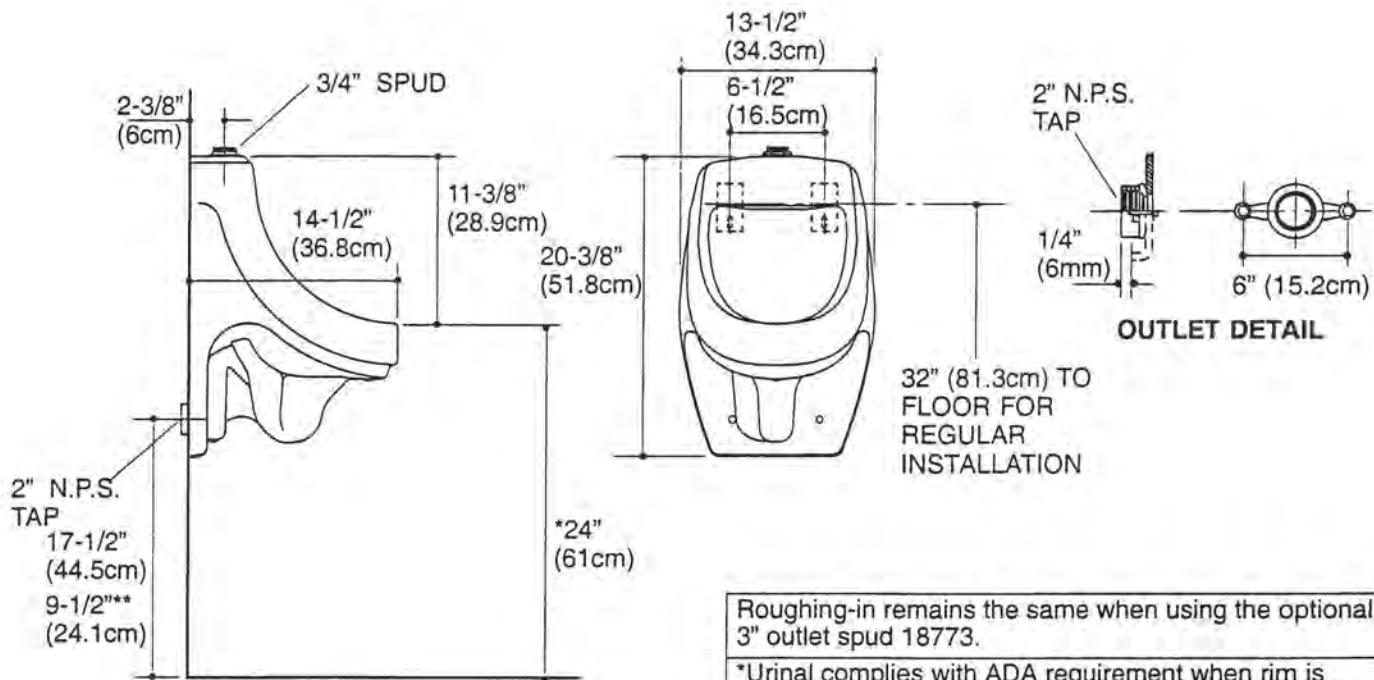
- Z6003PL - Aquaflush Plus** is furnished as specified above and includes sweat solder kit, vandal resistant stop cap, and cast wall flange.

This space is for Architectural/engineering Approval

ZURN INDUSTRIES, INC. • COMMERCIAL BRASS OPERATION • 5900 ELWIN BUCHANAN DRIVE • SANFORD NC 27330
 Phone: 1-800-997-3876 • Fax: 919-775-3541 • World Wide Web: www.zurn.com
 In Canada: ZURN INDUSTRIES LIMITED • 3544 Nashua Drive • Mississauga, Ontario L4V1L2 • Phone: 905-405-8272 Fax: 905-405-1292

PRODUCT INFORMATION

ADA compliant.	
Fixture:	
Configuration	Top spud
Spud inlet size	3/4"
Gallons per flush	< 1 gallon* (3.78L)
*Designed to flush with less than one gallon (3.78L) of water when installed with a water saving flush valve.	
Included Components:	
3/4" inlet spud	18376
2" outlet spud	18766
Hanger (2 required)	64512
Flush valve requirements: Refer to manufacturer's instructions and local codes.	



Roughing-in remains the same when using the optional 3" outlet spud 18773.

*Urinal complies with ADA requirement when rim is mounted no higher than 17" (43.2cm) from finished floor.

**Outlet height for ADA compliance.

1.25>116

PRODUCT DIAGRAM



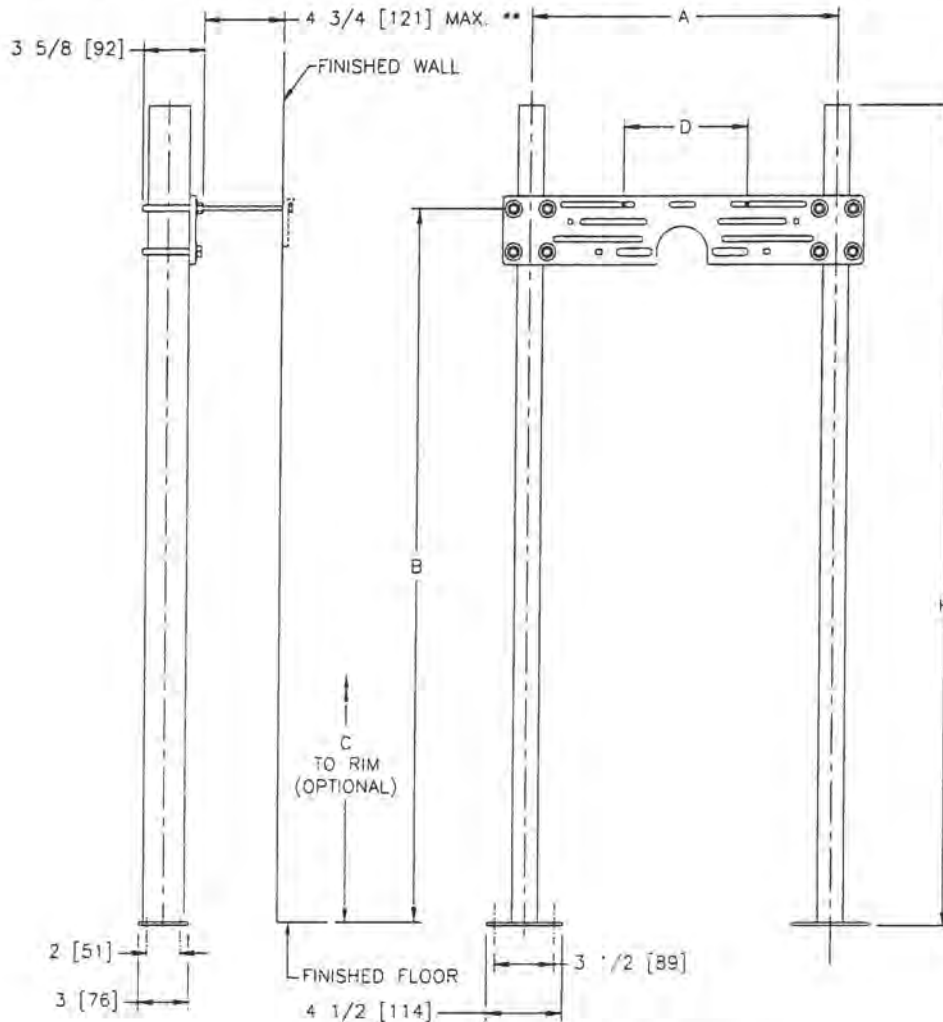
Z-1221

PLATE TYPE SYSTEM WALL URINALS

SPECIFICATION SHEET

TAG UR-1

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



** WITH STANDARD STUD LENGTH OF 6 [152].

Product No.	Approx. Wt. Lbs. [kg]
Z-1221	50 [23]

ENGINEERING SPECIFICATION: ZURN Z-1221 Wall urinal support system with top support plate. Complete with Dura-Coated rectangular steel uprights with welded feet, adjustable support plate, and mounting fasteners.

OPTIONS (Check/specify appropriate options)

PREFIXES

Z- Dura-Coated System with Universal Plate*

SUFFIXES

- CU Floor to Ceiling Upright
- D Back to Back System
- SL Stud Length Greater Than 6 [152] (Specify Length)
- 58 Flush Valve Supply Support for Urinals

REV. C DATE: 8/31/99 C.N. NO. 83103

DWG. NO. 58849 PRODUCT NO. Z-1221

*REGULARLY FURNISHED UNLESS OTHERWISE SPECIFIED

ZURN INDUSTRIES, INC. ♦ SPECIFICATION DRAINAGE OPERATION ♦ 1801 Pittsburgh Ave. ♦ Erie, PA 16514

Phone: 814/455-0921 ♦ Fax: 814/454-7929 ♦ World Wide Web: www.zurn.com

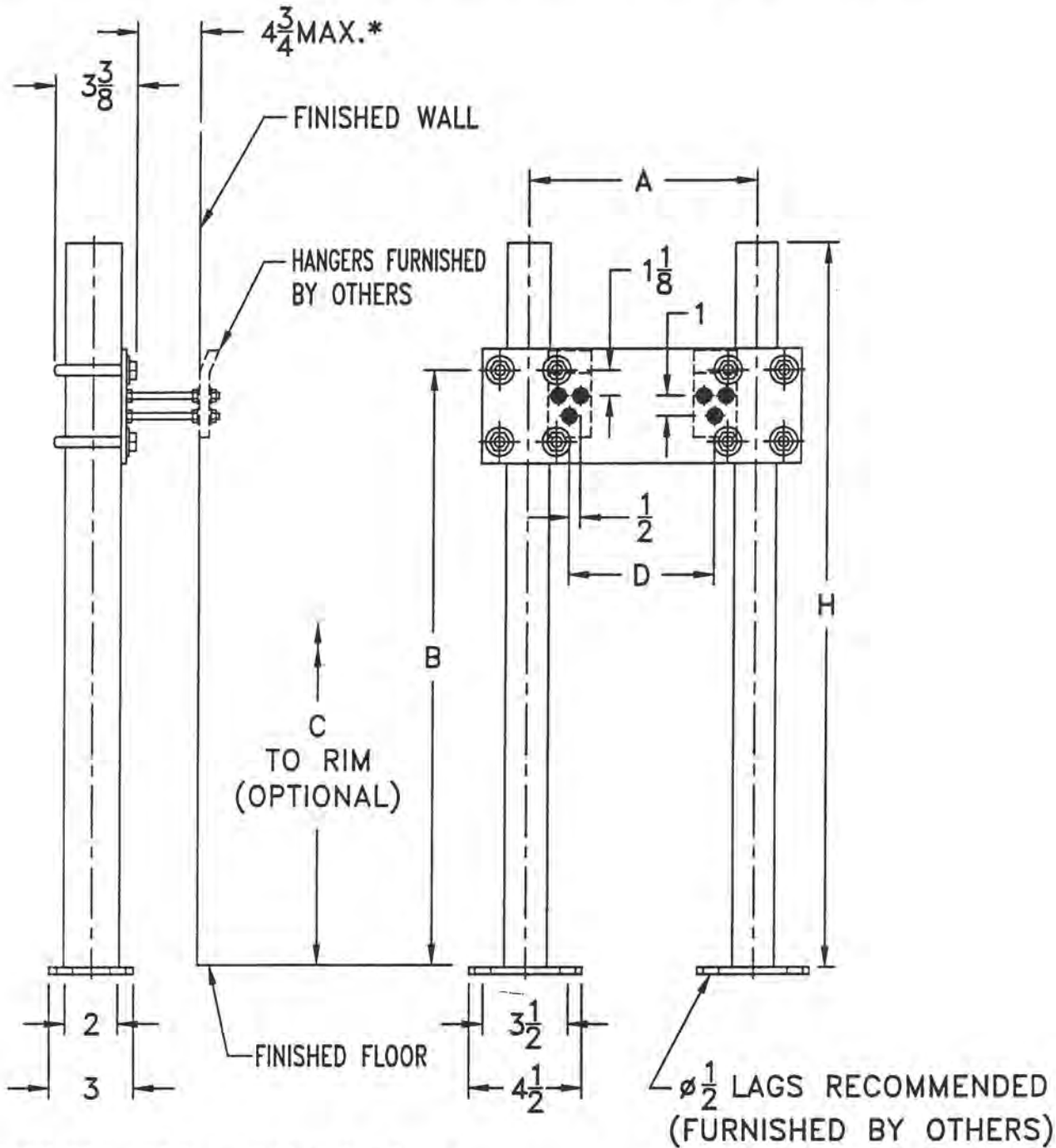
In Canada: ZURN INDUSTRIES LIMITED ♦ 3544 Nashua Drive ♦ Mississauga, Ontario L4V1L2 ♦ Phone: 905/405-8272 Fax: 905/405-1292



SPECIAL Z-1221 FOR WALLS W/ 16" CEN. TO CEN.
BETWEEN STUDS FOR KOHLER CO. LAVATORIES

DIMENSIONS SUBJECT TO MANUFACTURING TOLERANCES

KOHLER CO. REFERENCE			ZURN REFERENCE				
NAME	CATALOG NO.	SIZE	A	B	C	D	H
DEXTER LITE	5014-T, 5016-T	13-1/2 X 14-1/4	9-5/8	33-1/8	24	6-1/2	36



* WITH STANDARD STUD LENGTH OF 6

ENGINEERING SPECIFICATION:

AS SHOWN; "DURA-COATED" STEEL STANCHIONS WITH WELDED FEET, ADJUSTABLE SUPPORT PLATE, AND MOUNTING BOLTS AND TRIM.

DATE: 12/16/98	PRODUCT NUMBER Z-1221
REV. _____	DRAWING NUMBER 62980
C.N. NO. 81924	

LAV-1 LAVATORY

LAV-1 LAVATORY

KOHLER K2209-0 2209-0 WHT 15X12 CAXTON UM VC LAV
SYMMONS SS20 SGL LEV LAV FCT ONLY CP
KEENEY KE5700PC CP OFFSET GRID DRAIN
PROFLO PF8617COH 1-1/4 17 GA CP P TRAP W/ CO
PROFLO PF202WH WHITE 3 PC P TRAP & SUPPLY COVER
BRASSCRAFT BSR19C CP 1/2 SWT X 3/8 COMP ANGLE ST LK
BRASSCRAFT B112AC CP 3/8X12 1PC LAV RSR
PROFLO PFE7 5/8 OD ESC CP

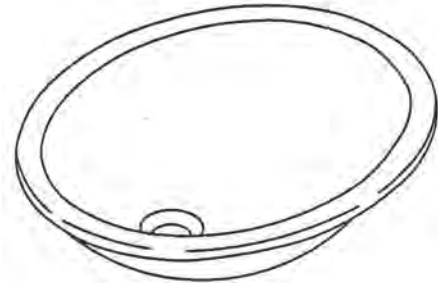
UNDERCOUNTER LAVATORY

→ **K-2209, K-2210,
K-2211**

ADA

FEATURES

- 15" (38.1cm) x 12" (30.5cm) (K-2209)
- 17" (43.2cm) x 14" (35.6cm) (K-2210)
- 19" (48.3cm) x 15" (38.1cm) (K-2211)
- Vitreous china
- Undercounter
- With overflow
- ADA compliant
- Includes 52047 clamp assembly



CODES/STANDARDS APPLICABLE

Specified model meets or exceeds the following:

- ADA
- ASME/ANSI A112.19.2M
- CABO/ANSI A117.1
- IAPMO/UPC
- Canadian Standards Association (CSA)
- State of Massachusetts

COLORS/FINISHES

- 0 White
- Other Refer to Price Book for additional colors

Accessories:

- CP Polished Chrome
- Other Refer to Price Book for additional finishes

SPECIFIED MODEL:

Model	Description	Colors/Finishes	
K-2209	15" (38.1cm) x 12" (30.5cm) lavatory	<input checked="" type="checkbox"/> 0 White	<input type="checkbox"/> Other _____
K-2210	17" (43.2cm) x 14" (35.6cm) lavatory	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other _____
K-2210-G	17" (43.2cm) x 14" (35.6cm) lavatory with glazed underside without overflow	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other _____
K-2210-N	17" (43.2cm) x 14" (35.6cm) lavatory without overflow	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other _____
K-2211	19" (48.3cm) x 15" (38.1cm) lavatory	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other _____
K-2211-G	19" (48.3cm) x 15" (38.1cm) lavatory with glazed underside without overflow	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other _____

Recommended Accessories

K-8998	Trap	<input type="checkbox"/> CP	<input type="checkbox"/> Other _____
--------	------	-----------------------------	--------------------------------------

PRODUCT SPECIFICATION:

The undercounter lavatory shall be 15" (38.1cm) in length, and 12" (30.5cm) in width (K-2209), 17" (43.2cm) in length, and 14" (35.6cm) in width (K-2210), or 19" (48.3cm) in length, and 15" (38.1cm) in width (K-2211). Lavatory shall be made of vitreous china. Lavatory shall have overflow. Lavatory shall be ADA compliant. Lavatory shall include 52047 clamp assembly. Lavatory shall be Kohler Model K-_____.

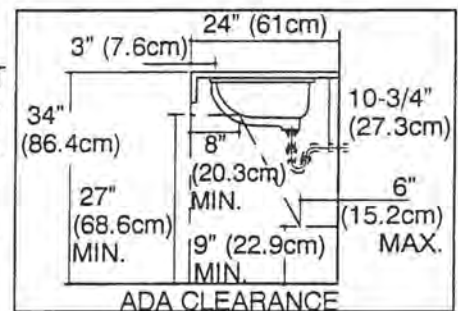
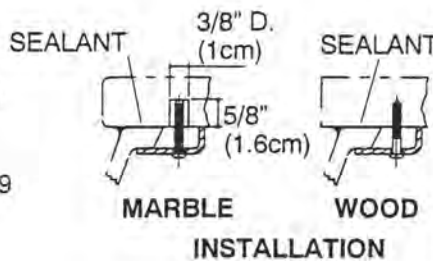
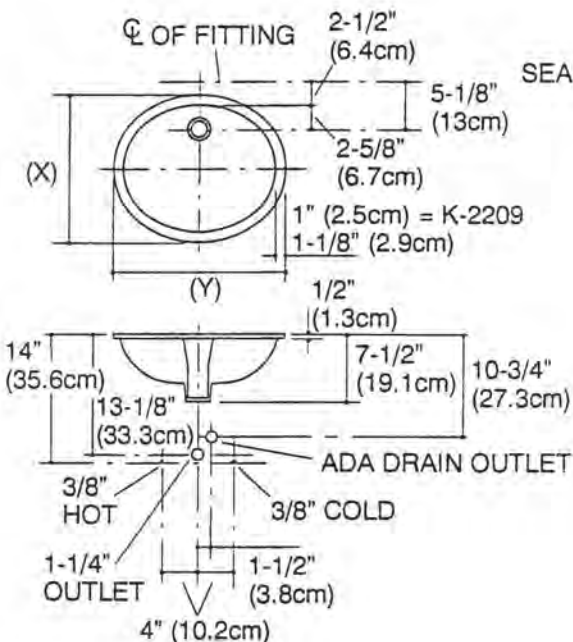
PRODUCT INFORMATION

ADA compliant.			
Fixture*:		basin area	water depth
K-2209		15" (38.1cm) x 12" (30.5cm)	4" (10.2cm)
K-2210/ K-2210-N		17" (43.2cm) x 14" (35.6cm)	4" (10.2cm)
K-2211		19" (48.3cm) x 15" (38.1cm)	4" (10.2cm)
Outlet	1-3/4" D. (4.4cm)		
* Approximate measurements for comparison only.			

Included Components:	
Basin clamp assembly	52047
Adhesive sealant	63034
Cutout template, K-2209	85838-7
Cutout template, K-2210	1002975-7
Cutout template, K-2211	1018997-7

INSTALLATION NOTES

Install this product according to the installation guide. Supplied basin clamp assemblies require 1" (2.5cm) minimum countertop thickness. Installer must supply anchors for thinner countertops.



Roughing-In Notes

K-2209: (X)=14" (35.6cm), (Y)=17" (43.2cm).
K-2210: (X)=16-1/4" (41.3cm), (Y)=19-1/4" (48.9cm).
K-2211: (X)=17-1/4" (43.8cm), (Y)=21-1/4" (54cm).

PRODUCT DIAGRAM

SYMMETRIX® Single Handle Lavatory Faucet

(Replaces Temptrol® S-90 Series Lavatory Faucet)

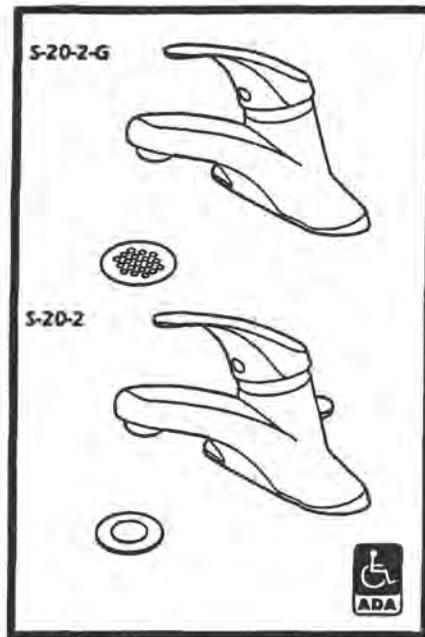
- S-20-2-G: With grid strainer drain assembly
- S-20-2: With lift rod and pop-up drain assembly
- S-20-1: With lift rod only
- S-20-0: Faucet only (no lift-rod hole)
- S-20: Faucet only (with lift-rod hole)

Symmetrix Single Lever Lavatory Faucet with ceramic control components, handle limit stop, and red/blue indicators on handle. Aerator, 3/8" supplies, 4" centers, metal construction, polished chrome finish.

Modifications:

Add:

- Suffix LP: Loop handle
- Suffix W: 6" lever handle
- Suffix OFG: Offset grid strainer
- Suffix FR: 0.5 gpm flow restrictor outlet spray (vandal resistant)
- Suffix VP: Vandal resistant aerator
- Suffix IPS: 1/2" IPS connections
- Suffix LST: 1/6" copper supply tubes
- Suffix NA: Non-aerated, laminar flow outlet
- Suffix AWT: White finish
- Suffix BRS: Radiance® polished brass finish
- Suffix PCB: Polished chrome and Radiance® polished brass finish
- Suffix STN: Satin finish



**SYMMONS PRODUCTS MEET
ANSI A112.18.1M, EPA '92
AND ALL KNOWN FLOW RATE
REQUIREMENTS.
Kitchen and Lavatory Faucets
2.0 GPM (7.6 L/min)**

Job/Location

.....
.....

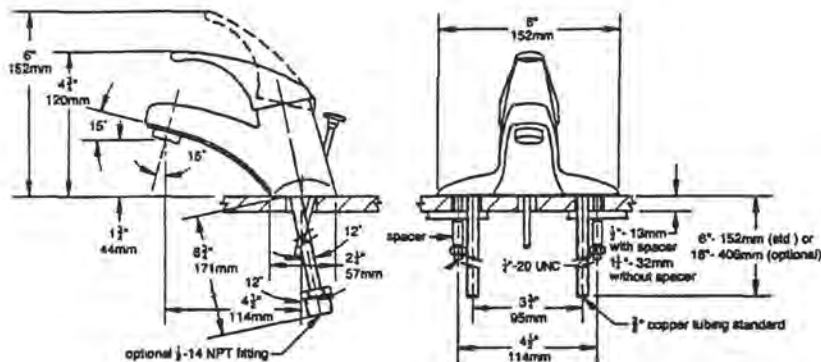
Engineer

.....
.....

Contractor

.....
.....

For ADA compliance (Americans with Disabilities Act) consult ADAAG or your state regulations for proper product choice and mounting locations.



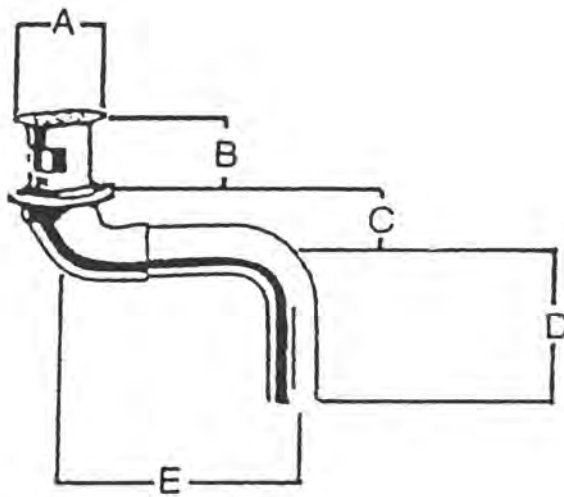
SYMMONS INDUSTRIES, INC.
31 Brooks Drive, Braintree, MA 02184-3804
TEL: 1-800-SYMMONS, (781) 848-2250 FAX: 1-800-961-9621, (781) 843-3849
Web site: www.symmons.com

© 2001 Symmons Industries, Inc. 12/01



KEENEY

SPECIFICATION SHEET



Catalog No.

Dimensions

	A	B	C	D	E
5700PC	2 3/16"	1 7/16"	1"	7 3/4"	5"

THE KEENEY MANUFACTURING COMPANY

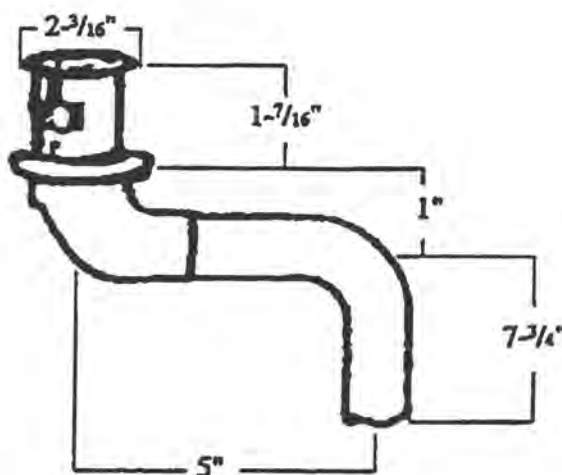
PRODUCT INFORMATION SHEET

K

THE KEENEY MANUFACTURING COMPANY

Lavatory Strainer

5700PC



FEATURES:

- **Chrome Plated**
- **Cast Brass Plug with Strainer and Drain assembly**
- **17 Gauge Tailpiece**

Contact Your Nearest Representative At: **The Keeney Manufacturing Company**
 1170 Main Street • Newington, CT 06111 • 1-800-243-0526 • Fax # (203) 665-0374



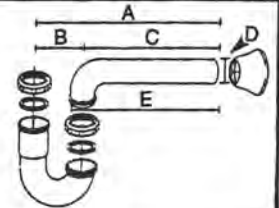
Commercial Product Information and Specifications

MODEL	DESCRIPTION
PF8617H	1 1/4" 17 Gauge CP P-Trap
PF8617HJ	1 1/4" X 1 1/2" 17 Gauge CP P-Trap
PF8617J	1 1/2" 17 Gauge CP P-Trap

- 17 gauge
- Chrome plated
- Deep pattern steel flange
- Solid brass, chrome plated nuts

SPECIFICATIONS

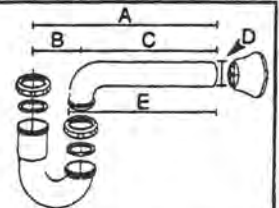
PF8617H	PF8617HJ PF867J
A: 11"	12"
B: 3 1/4"	3 1/4"
C: 7 3/4"	8 3/4"
D: 1 1/4"	1 1/2"
E: 8"	9"



PF8620H	1 1/4" 20 Gauge CP P-Trap
PF8620J	1 1/2" 20 Gauge CP P-Trap

- 20 gauge
- Chrome plated
- Deep pattern steel flange
- Zink die cast nuts

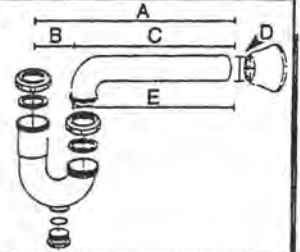
PF8620H	PF8620HJ
A: 11"	12"
B: 3 1/4"	3 1/4"
C: 7 3/4"	8 3/4"
D: 1 1/4"	1 1/2"
E: 8"	9"



PF8617COH	1 1/4" 17 Gauge CP P-Trap
PF8617COHJ	1 1/4" X 1 1/2" 17 Gauge CP P-Trap
PF8617COJ	1 1/2" 17 Gauge CP P-Trap

- 17 gauge
- Chrome plated
- Deep pattern steel flange
- Solid brass, chrome plated nuts
- With cleanout

PF8617COH	PF8617COHJ PF8617COJ
A: 11"	12"
B: 3 1/4"	3 1/4"
C: 7 3/4"	8 3/4"
D: 1 1/4"	1 1/2"
E: 8"	9"



SUBMITTAL SHEET

PRODUCT DESCRIPTION

TRAP COVERS waste and supply piping covers satisfy ADA compliance requirements with its unique and universal design, allowing for easy installation over virtually all tubular and cast brass P-trap assemblies, as well as angle valve and supply tube assemblies, regardless of their geometry or rotational offset. Smooth, flush Snap Clip™ fasteners firmly secure piping covers in place.

SAMPLE SPECIFICATIONS

Handicap lavatory P-trap and angle valve assemblies shall be covered with the soft, antimicrobial, TRAP COVERS piping covers sold by PROFLO™

Model # **PF202WH**, Accessory # **PF205WH**
 Piping cover shall be secured with Snap Clip™ flush mounted fasteners. Angle stop valve shall be secured with locking lid access cover. Cover shall be white, non-yellowing and fire retardant.



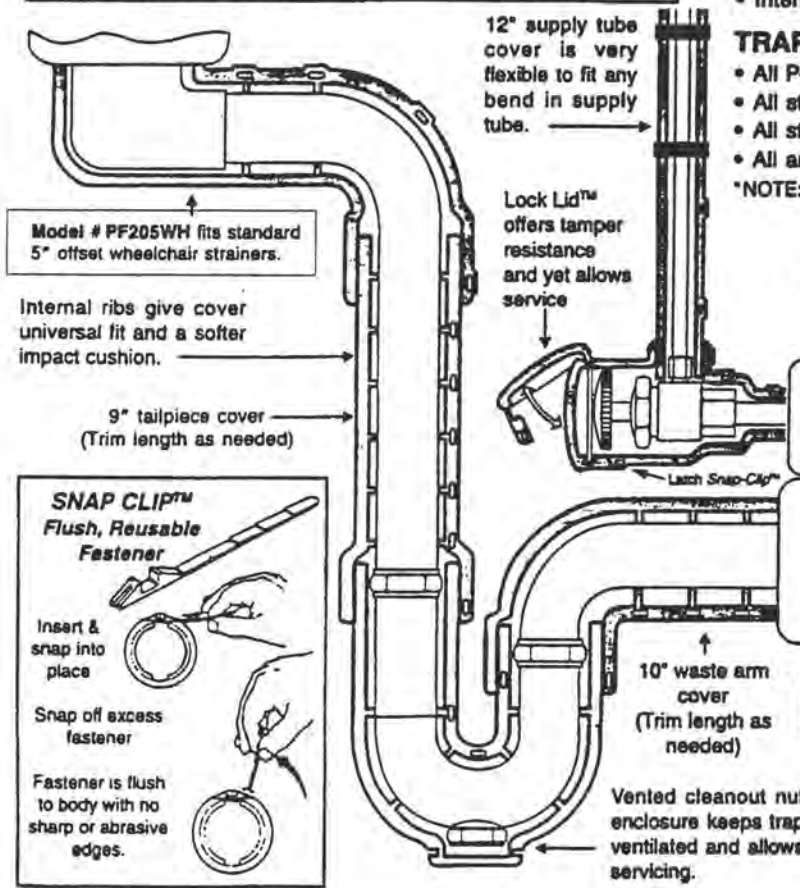
TRAP COVERS™

DESIGN FEATURES

- Universal design fits virtually all lavatory applications
- Antimicrobial vinyl maintains sanitary conditions
- Lock Lid™ on valve stops tampering & allows service
- Cleanout nut cap allows service on trap without disassembly
- Snap-Clip™ fastener is flush, nonabrasive & reusable
- Internal ribs enhance K valve & soften impact cushioning

TRAP COVERS KITS FIT:

- All P-trap assemblies, cast brass or tubular - 1¼" or 1½"
 - All straight tail piece assemblies - 1¼" or 1½"
 - All standard 5" offset wheelchair strainers. (Model # PF205WH)
 - All angle stop valves - handled or keyed type ¾" or ½"
- *NOTE: TRAP COVERS Kits will not fit Schedule 40 plastic P-traps.



Models Available:

Color: White

- Select model.
- Model #PF200WH
One P-trap cover.
 - Model #PF201WH
One P-trap cover, one angle valve and one 12" supply cover.
 - Model #PF202WH
One P-trap cover, two angle valve covers, and two 12" supply covers.
 - Model #PF203WH
One P-trap cover, two angle valve covers, two 12" supply covers, one 5" offset tailpiece wheelchair strainer cover.
 - Model #PF205WH
One 5" offset tailpiece wheelchair strainer assembly.
 - Model #PF299WH
One angle valve and one 12" supply cover.
 - Extension #PFEX299WH
One 16" extension for water supply.
 - Extension #PFEX200WH
One 16" extension for drain waste arm or tailpiece.

MATERIAL:	MOLDED CLOSED CELL VINYL
NOM. WALL:	1/8 INCH CONSTANT
DUROMETER:	55 - 65 - SHORE A
UV PROTECTION:	WILL NOT FADE OR DISCOLOR
DURABILITY:	VIRTUALLY INDESTRUCTIBLE
FASTENERS:	SNAP-CLIP™, FLUSH, REUSABLE
COLOR:	WHITE
PAINTABILITY:	APPLY ACRYLIC ENAMEL
BURNING CHARACTERISTICS ASTM D 635:	SELF-EXTINGUISHED 5 SEC (ATB) 10 MM (AEB)
THERMAL CONDUCTIVITY ASTM C 177:	BTU · IN/HR · FT ² · °F K VALUE = 1.17
BACTERIA/FUNGUS RESIST:	ANTIMICROBIAL VINYL FORMULA
MAINTENANCE:	USE COMMON DETERGENTS

CLASSIFIED

 LAV GUARD
 CLASSIFIED BY
 UNDERWRITERS LABORATORIES INC.*
 IN ACCORDANCE WITH ADA article 4.19.4
 22FF



Approved By: _____

Made in U.S.A.



Brass Craft, Product Specifications Guide

STOP

OVAL HANDLE STYLE

Use:	Supply stop for potable water distribution systems.
Operating Pressure:	125 psi maximum
Operating Temperature:	40 - 140°F Intermittent to 180°F
Material Specifications:	<p>Body and other brass components – C36000 brass.</p> <p>Stem – C36000 brass or polymer.</p> <p>Washers – Bib and packing washers, Nitrile or EPDM rubber.</p> <p>Handle – Die cast metal or Polycarbonate plastic.</p>
Designed and Manufactured In Accordance With:	<p>ANSI A112.18.1M</p> <p>Canadian Standard CAN/CSA-B125-M93</p>
Approvals/Listings:	<p>IAPMO File #645 – Except Dual-Outlet Except valves with inlet connection to PEX pipe. Dual-Shutoff valves are IAPMO listed.</p> <p>IAPMO File #C-3678 – Valves with inlet connection to PEX pipe. CSA Approved – Except valves with inlet connection to PEX pipe.</p>

1/2" X 3/8" LOOSE KEY ANGLE STOP

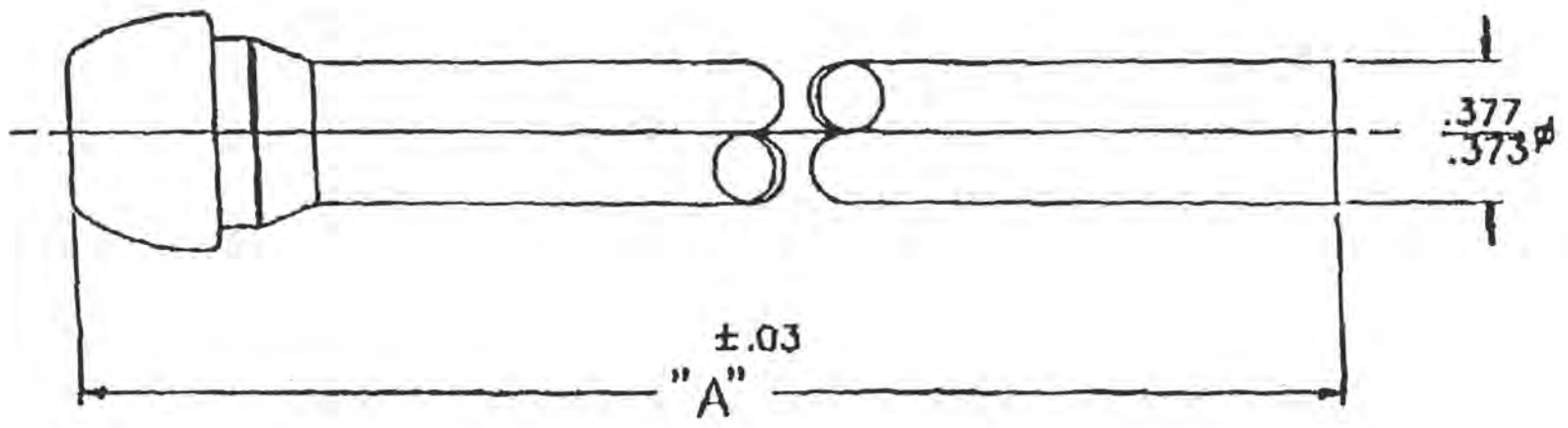


October 14, 1997

FERGUSON

ITEM NO. SEE CHART
 ITEM DESCRIPTION SEE CHART
 DRAWING NO. RPA0052B

REV.	DATE	PER	BY	CHANGE
A	8/21/94	WK	ROG	RELEASE FOR PRODUCTION
B ₁	10/25/94	WK	AWK	REVISED "A" LENGTH DIM'S
B ₂	10/25/94	WK	AWK	ADDED MAT'L INFO.
B ₃	10/25/94	WK	AWK	ADDED "INSTALLATION" TO DESCR.



PART NO.	ITEM I.D.	"A" DIM
1-12A	230000	11.63
1-15A	230030	14.63
1-20A	230060	19.63
1-30A	230090	29.63
1-38A	230120	35.63

Brass Craft.
 Novi, Michigan
 A Subsidiary of Inasco Corporation

CLASSIFICATION AND ACCEPTABLE QUALITY LEVELS

ETHICAL	CLASS
⊕	CRITICAL
⊖	MAJOR
○	MINOR

DESCRIPTION	MATERIAL	STATUS	DATE
LAVATORY SUPPLY TUBE INSTALLATION DRAWING	CA122 COPPER	GREEN	8/21/94
NOTE: UNLESS OTHERWISE SPECIFIED TWO PLACE DECIMALS THREE PLACE DECIMALS ANGULARITY	ROD. WT./IN FIL. WT./IN	CHK'D APPR	DATE 10/25/94

DRAWING NO.	REV.
RPA0052B	B
ITEM DESCRIPTION	SEE CHART
ITEM ID	SEE CHART
SIZE	A

(B3)

(B2)

SCALE: 2:1

PROFLO™

Standard Type



Chrome plated steel.

No.	Size In.
Iron Pipe Sizes	
PFE1	3/8
PFE2	1/2
PFE8	3/4
PFE9A	1
PFE10	1 1/4
PFE11	1 1/2
PFE16A	2
Polished Brass	
PFE2PB	1/2
Copper Tube Sizes	
PFE7	5/8 OD (1/2 CTS)
PFE9	7/8 OD (3/4 CTS)
Polished Brass	
PFE7PB	5/8 OD (1/2 CTS)

LAV-2 LAVATORY

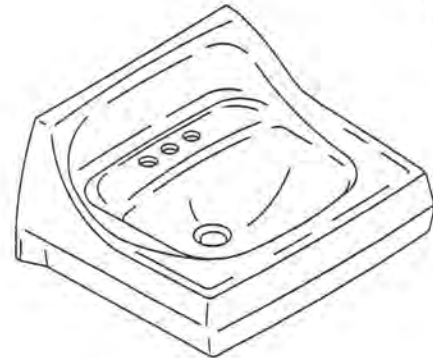
LAV-2 LAVATORY

KOHLER K2005WH WHITE 21X18 *KINGSTON 4 CC VC LAV
SYMMONS SS20 SGL LEV LAV FCT ONLY CP
KEENEY KE5700PC CP OFFSET GRID DRAIN
PROFLO PF8617COH 1-1/4 17 GA CP P TRAP W/ CO
PROFLO PF202WH WHITE 3 PC P TRAP & SUPPLY COVER
BRASSCRAFT BSR19C CP 1/2 SWT X 3/8 COMP ANGLE ST LK
BRASSCRAFT B112AC CP 3/8X12 1PC LAV RSR
PROFLO PFE7 5/8 OD ESC CP
ZURN ZZ1231 Z-1231 LAV SUPPORT SYSTEM

WALL-MOUNT LAVATORY

→ **K-2005, K-2006
K-2007**

ADA



FEATURES

- 21-1/4" (54cm) x 18-1/8" (46cm)
- Vitreous China
- Wall-Mount
- With hanger
- 4" (10.2cm) centers (K-2005), 8" (20.3cm) centers (K-2006), or single-hole (K-2007) drilling
- With overflow
- ADA compliant
- Drilled for concealed arm carrier
- Optional soap dispenser hole on left (-L) or right (-R)

CODES/STANDARDS APPLICABLE

Specified model meets or exceeds the following:

- ADA
- ASME/ANSI A112.19.2M
- CABO/ANSI A117.1
- IAPMO/UPC
- Canadian Standards Association (CSA)
- State of Massachusetts

COLORS/FINISHES

- • 0 White
- Other Refer to Fixtures Price Book for additional colors

Accessories:

- CP Polished Chrome
- Other Refer to Faucets Price Book for additional finishes

SPECIFIED MODEL:

Model	Description	Colors/Finishes	
K-2005	4" (10.2cm) centers lavatory less soap dispenser hole	<input checked="" type="checkbox"/> 0 White	<input type="checkbox"/> Other _____
K-2005-L	4" (10.2cm) centers lavatory with soap dispenser hole on left	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other _____
K-2005-R	4" (10.2cm) centers lavatory with soap dispenser hole on right	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other _____
K-2006	8" (20.3cm) centers lavatory less soap dispenser hole	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other _____
K-2007	Single-hole lavatory less soap dispenser hole	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other _____
K-2007-L	Single-hole lavatory with soap dispenser hole on left	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other _____
K-2007-R	Single-hole lavatory with soap dispenser hole on right	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other _____

Recommended Accessories

K-8998	Trap	<input type="checkbox"/> CP	<input type="checkbox"/> Other _____
--------	------	-----------------------------	--------------------------------------

PRODUCT SPECIFICATION:

The lavatory with back shall be 21-1/4" (54cm) in length, and 18-1/8" (46cm) in width. Lavatory shall be made of vitreous china. Lavatory shall be wall-mounted with wall hangers. Lavatory shall have 4" (10.2cm) centers (K-2005), 8" (20.3cm) centers (K-2006), or single-hole (K-2007) drilling. Lavatory shall have overflow. Lavatory shall be ADA compliant. Lavatory shall be drilled for concealed arm carrier. Lavatory shall have optional soap dispenser hole on left (-L) or right (-R). Lavatory shall be Kohler Model K-_____.

PRODUCT INFORMATION

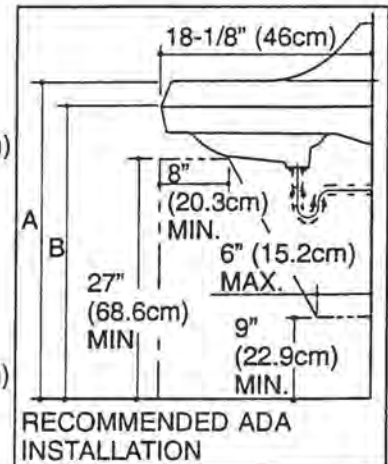
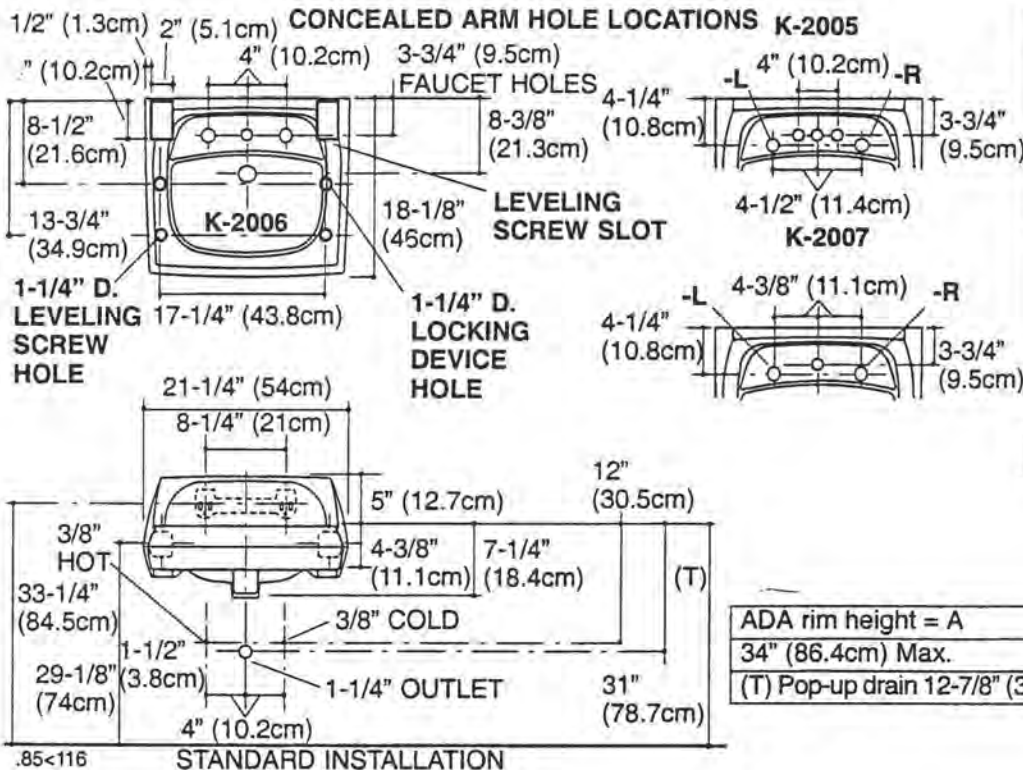
Fixture*:		basin area	water depth
Lavatory		16" (40.6cm) x 10" (25.4cm)	3-1/8" (7.9cm)
Drain hole	1-3/4" D. (4.4cm)		
Holes	K-2005	K-2006	K-2007
Spout	1-1/4" D. (3.2cm)	1-3/8" D. (3.5cm)	1-3/8" D. (3.5cm)
Faucet	1-1/4" D. (3.2cm)	1-3/8" D. (3.5cm)	
Soap dispenser	1-1/4" D. (3.2cm)		1-1/4" D. (3.2cm)
Included Components:			
Hanger			64839

INSTALLATION NOTES

Install this product according to the installation guide. Fixture dimensions are nominal and conform to tolerances in ASME Standard A112.19.2M.

Concealed arm carrier required, **NOT** supplied by Kohler Co. Supplied hanger not used with concealed arm carrier.

NOTICE: Countertop manufacturer or cutter **must** use the cut-out template provided with the product, or a current one provided by Kohler Co. (call 1-800-43-FOCUS). Kohler Co. is not responsible for cut-out errors when the incorrect cut-out template is used.



ADA rim height = A	ADA arm carrier height = B
34" (86.4cm) Max.	32-1/8" (81.6cm) Max.
(T) Pop-up drain 12-7/8" (32.7cm), grid drain 12" (30.5cm).	

PRODUCT DIAGRAM

SYMMETRIX® Single Handle Lavatory Faucet

(Replaces Temptrol® S-90 Series Lavatory Faucet)

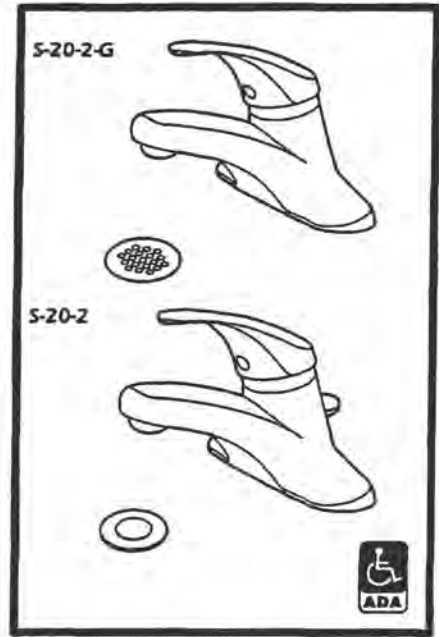
- S-20-2-G: With grid strainer drain assembly
- S-20-2: With lift rod and pop-up drain assembly
- S-20-1: With lift rod only
- S-20-0: Faucet only (no lift-rod hole)
- S-20: Faucet only (with lift-rod hole)

Symmetrix Single Lever Lavatory Faucet with ceramic control components, handle limit stop, and red/blue indicators on handle. Aerator, 3/8" supplies, 4" centers, metal construction, polished chrome finish.

Modifications:

Add:

- Suffix LP: Loop handle
- Suffix W: 6" lever handle
- Suffix OFG: Offset grid strainer
- Suffix FR: 0.5 gpm flow restrictor outlet spray (vandal resistant)
- Suffix VP: Vandal resistant aerator
- Suffix IPS: 1/2" IPS connections
- Suffix LST: 16" copper supply tubes
- Suffix NA: Non-aerated, laminar flow outlet
- Suffix AWT: White finish
- Suffix BRS: Radiance® polished brass finish
- Suffix PCB: Polished chrome and Radiance® polished brass finish
- Suffix STN: Satin finish



SYMMONS PRODUCTS MEET
ANSI A112.18.1M, EPA '92
AND ALL KNOWN FLOW RATE
REQUIREMENTS.
Kitchen and Lavatory Faucets
2.0 GPM (7.6 L/min)

Job/Location

.....
.....

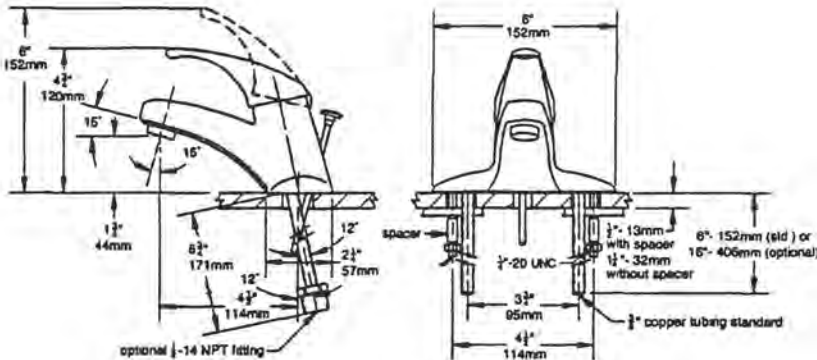
Engineer

.....
.....

Contractor

.....
.....

For ADA compliance (Americans with Disabilities Act) consult ADAAG or your state regulations for proper product choice and mounting locations.



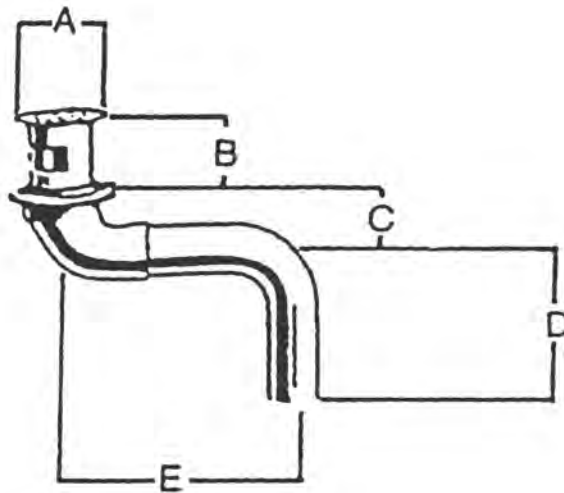
SYMMONS INDUSTRIES, INC.
31 Brooks Drive, Braintree, MA 02184-3804
TEL 1-800-SYMMONS, (781) 848-2250 FAX: 1-800-961-9621, (781) 843-3849
Web site: www.symmons.com

© 2001 Symmons Industries, Inc. 12/01



KEENEY

SPECIFICATION SHEET



Catalog No.

Dimensions

	A	B	C	D	E
5700PC	2 3/16"	1 7/16"	1"	7 3/4"	5"

THE KEENEY MANUFACTURING COMPANY

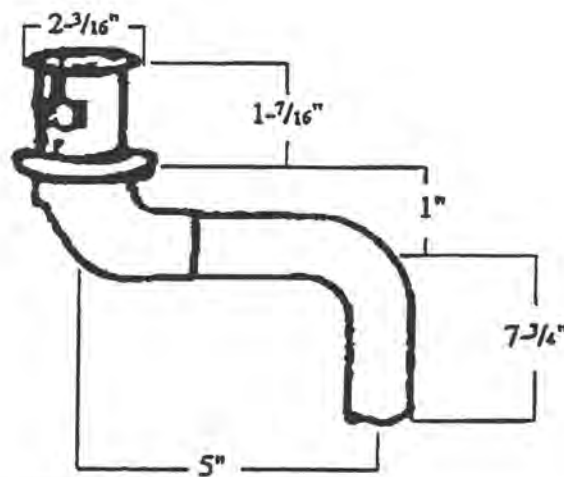
PRODUCT INFORMATION SHEET

K

THE KEENEY MANUFACTURING COMPANY

Lavatory Strainer

5700PC



FEATURES:

- **Chrome Plated**
- **Cast Brass Plug with Strainer and Drain assembly**
- **17 Gauge Tailpiece**

Contact Your Nearest Representative At: **The Keeney Manufacturing Company**
 1170 Main Street • Newington, CT 06111 • 1-800-243-0526 • Fax # (203) 665-0374



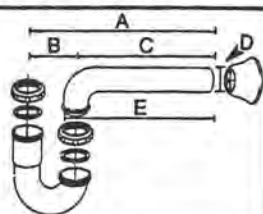
Commercial Product Information and Specifications

MODEL	DESCRIPTION
PF8617H	1 1/4" 17 Gauge CP P-Trap
PF8617HJ	1 1/4" X 1 1/2" 17 Gauge CP P-Trap
PF8617J	1 1/2" 17 Gauge CP P-Trap

- 17 gauge
- Chrome plated
- Deep pattern steel flange
- Solid brass, chrome plated nuts

SPECIFICATIONS

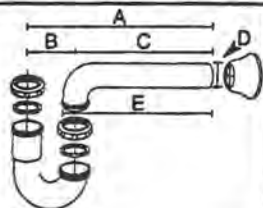
PF8617H	PF8617HJ PF867J
A: 11"	12"
B: 3 1/4"	3 1/4"
C: 7 3/4"	8 3/4"
D: 1 1/4"	1 1/2"
E: 8"	9"



PF8620H	1 1/4" 20 Gauge CP P-Trap
PF8620J	1 1/2" 20 Gauge CP P-Trap

- 20 gauge
- Chrome plated
- Deep pattern steel flange
- Zink die cast nuts

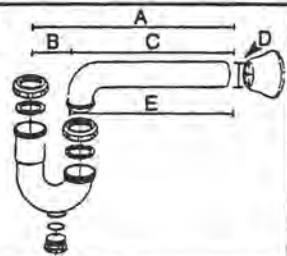
PF8620H	PF8620HJ
A: 11"	12"
B: 3 1/4"	3 1/4"
C: 7 3/4"	8 3/4"
D: 1 1/4"	1 1/2"
E: 8"	9"



PF8617COH	1 1/4" 17 Gauge CP P-Trap
PF8617COHJ	1 1/4" X 1 1/2" 17 Gauge CP P-Trap
PF8617COJ	1 1/2" 17 Gauge CP P-Trap

- 17 gauge
- Chrome plated
- Deep pattern steel flange
- Solid brass, chrome plated nuts
- With cleanout

PF8617COH	PF8617COHJ PF8617COJ
A: 11"	12"
B: 3 1/4"	3 1/4"
C: 7 3/4"	8 3/4"
D: 1 1/4"	1 1/2"
E: 8"	9"



SUBMITTAL SHEET

PRODUCT DESCRIPTION

TRAP COVERS waste and supply piping covers satisfy ADA compliance requirements with its unique and universal design, allowing for easy installation over virtually all tubular and cast brass P-trap assemblies, as well as angle valve and supply tube assemblies, regardless of their geometry or rotational offset. Smooth, flush Snap Clip™ fasteners firmly secure piping covers in place.

SAMPLE SPECIFICATIONS

Handicap lavatory P-trap and angle valve assemblies shall be covered with the soft, antimicrobial, TRAP COVERS piping covers sold by PROFLO™

Model # **PF202WH** Accessory # **PF205WH**
 Piping cover shall be secured with Snap Clip™ flush mounted fasteners. Angle stop valve shall be secured with locking lid access cover. Cover shall be white, non-yellowing and fire retardant.



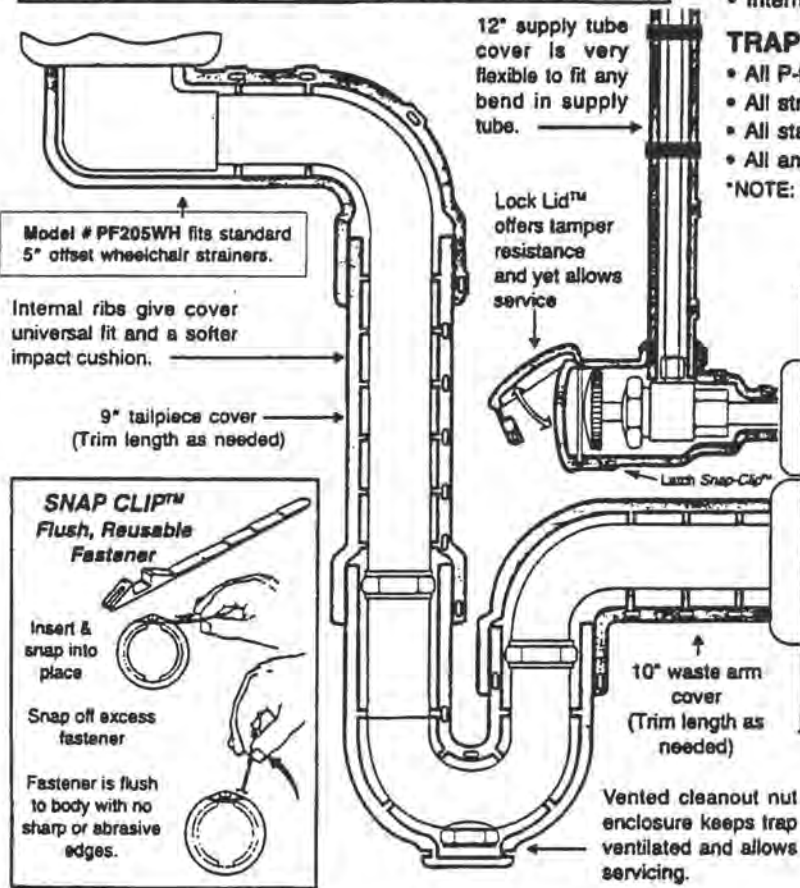
TRAP COVERS™

DESIGN FEATURES

- Universal design fits virtually all lavatory applications
- Antimicrobial vinyl maintains sanitary conditions
- Lock Lid™ on valve stops tampering & allows service
- Cleanout nut cap allows service on trap without disassembly
- Snap-Clip™ fastener is flush, nonabrasive & reusable
- Internal ribs enhance K valve & soften impact cushioning

TRAP COVERS KITS FIT:

- All P-trap assemblies, cast brass or tubular - 1 1/4" or 1 1/2"
 - All straight tail piece assemblies - 1 1/4" or 1 1/2"
 - All standard 5" offset wheelchair strainers. (Model # PF205WH)
 - All angle stop valves - handled or keyed type 3/8" or 1/2"
- *NOTE: TRAP COVERS Kits will not fit Schedule 40 plastic P-traps.



Models Available:

Select model.

Color: White

- Model # PF200WH
One P-trap cover.
- Model # PF201WH
One P-trap cover, one angle valve and one 12" supply cover.
- Model # PF202WH
One P-trap cover, two angle valve covers, and two 12" supply covers.
- Model # PF203WH
One P-trap cover, two angle valve covers, two 12" supply covers, one 5" offset tailpiece wheelchair strainer cover.
- Model # PF205WH
One 5" offset tailpiece wheelchair strainer assembly.
- Model # PF299WH
One angle valve and one 12" supply cover.
- Extension # PFEX299WH
One 16" extension for water supply.
- Extension # PFEX200WH
One 16" extension for drain waste arm or tailpiece.

MATERIAL:	MOLDED CLOSED CELL VINYL
NOM. WALL:	1/8 INCH CONSTANT
DUROMETER:	55 - 65 - SHORE A
UV PROTECTION:	WILL NOT FADE OR DISCOLOR
DURABILITY:	VIRTUALLY INDESTRUCTIBLE
FASTENERS:	SNAP-CLIP™, FLUSH, REUSABLE
COLOR:	WHITE
PAINTABILITY:	APPLY ACRYLIC ENAMEL
BURNING CHARACTERISTICS	SELF-EXTINGUISHED
ASTM D 635:	5 SEC (ATB) 10 MM (AEB)
THERMAL CONDUCTIVITY	BTU - IN/HR - FT ² - °F
ASTM C 177:	K VALUE = 1.17
BACTERIA/FUNGUS RESIST:	ANTIMICROBIAL VINYL FORMULA
MAINTENANCE:	USE COMMON DETERGENTS

CLASSIFIED
 LAV GUARD
 CLASSIFIED BY
 UNDERWRITERS LABORATORIES INC.*
 IN ACCORDANCE WITH ADA article 4.19.4
 22FF



Approved By: _____

Made in U.S.A.



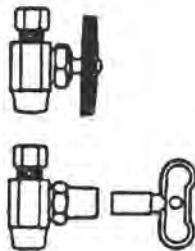
Brass Craft, Product Specifications Guide

STOP

OVAL HANDLE STYLE

Use:	Supply stop for potable water distribution systems.
Operating Pressure:	125 psi maximum
Operating Temperature:	40 - 140°F Intermittent to 180°F
Material Specifications:	<p>Body and other brass components – C36000 brass.</p> <p>Stem – C36000 brass or polymer.</p> <p>Washers – Bib and packing washers, Nitrile or EPDM rubber.</p> <p>Handle – Die cast metal or Polycarbonate plastic.</p>
Designed and Manufactured In Accordance With:	<p>ANSI A112.18.1M</p> <p>Canadian Standard CAN/CSA-B125-M93</p>
Approvals/Listings:	<p>IAPMO File #645 – Except Dual-Outlet Except valves with inlet connection to PEX pipe. Dual-Shutoff valves are IAPMO listed.</p> <p>IAPMO File #C-3678 – Valves with inlet connection to PEX pipe. CSA Approved – Except valves with inlet connection to PEX pipe.</p>

1/2" X 3/8" LOOSE KEY ANGLE STOP



October 14, 1997

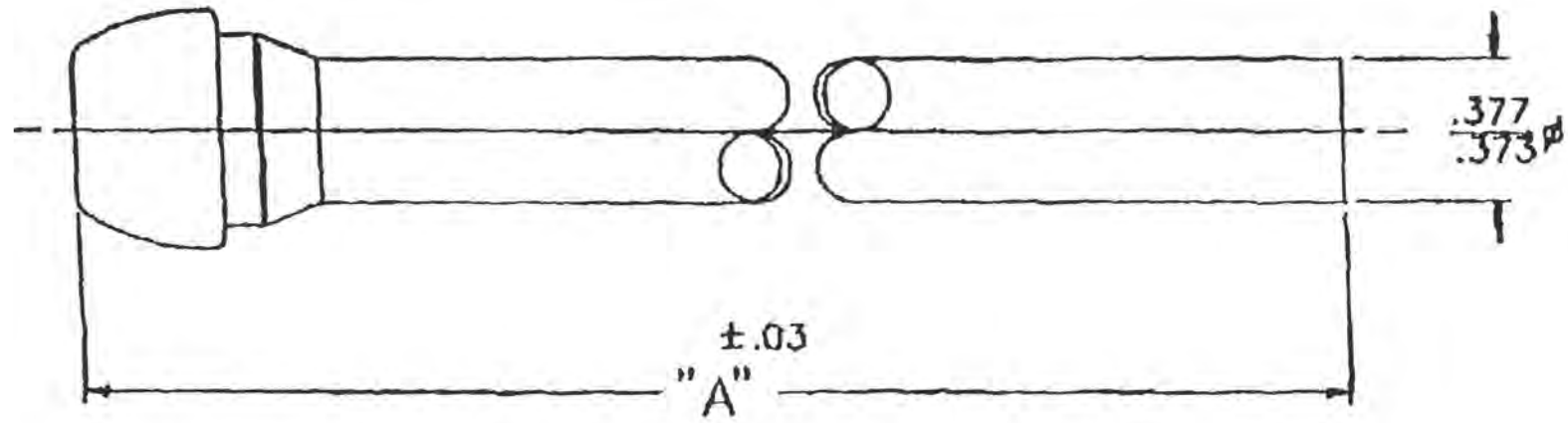
FERGUSON

ITEM ID
SEE CHART

ITEM DESCRIPTION
SEE CHART

DRAWING NO.
RPA0052B

REV.	DATE	FOR	BY	CHANGE
A	8/21/94	WK	RDG	RELEASE FOR PRODUCTION
B ₁	10/23/93	HKK	AWK	REVISED "A" LENGTH DIM'S
B ₂	10/20/94	JKH	AWK	ADDED MAT'L INFO.
B ₃	10/25/94	HKK	AWK	ADDED "INSTALLATION" TO DESCR.



(B1)

PART NO.	ITEM I.D.	"A" DIM
1-12A	230000	11.63
1-15A	230030	14.63
1-20A	230060	19.63
1-30A	230090	29.63
1-36A	230120	35.63

Brass Craft.
 NOV, MICHIGAN
 A Subsidiary of Masco Corporation

CLASSIFICATION AND ACCEPTABLE QUALITY LEVELS

FINISH	CLASS
⊕	CRITICAL
⊖	MAJOR
○	SIGNIFICANT
None	

(B3) (B2) SCALE: 2:1

DESCRIPTION	MATERIAL	STATUS	DATE
LAVATORY SUPPLY TUBE INSTALLATION DRAWING	CA122 COPPER	GREEN	8/21/94
NOTE: UNLESS OTHERWISE SPECIFIED TWO PLACE DECIMALS THREE PLACE DECIMALS ANGULARITY	ROD. WT./IN FIL. WT./IN	CHK'D 10/25/94	DATE

DRAWING NO.
RPA0052B

ITEM DESCRIPTION	REV.
SEE CHART	B
ITEM ID SEE CHART	A SIZE

PROFLO™

Standard Type



Chrome plated steel.

No.	Size In.
Iron Pipe Sizes	
PFE1	3/8
PFE2	1/2
PFE8	3/4
PFE9A	1
PFE10	1 1/4
PFE11	1 1/2
PFE16A	2
Polished Brass	
PFE2PB	1/2
Copper Tube Sizes	
PFE7	5/8 OD (1/2 CTS)
PFE9	7/8 OD (3/4 CTS)
Polished Brass	
PFE7PB	5/8 OD (1/2 CTS)

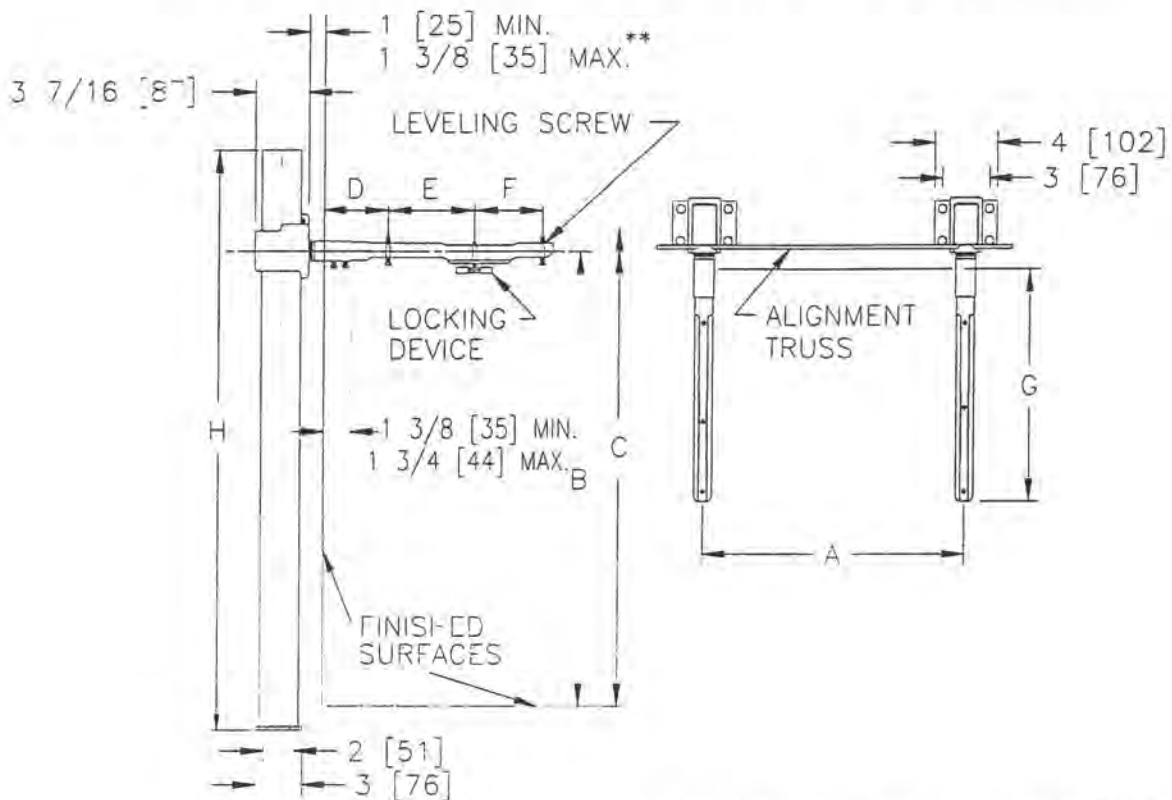


Z1231 CONCEALED ARM SYSTEM WALL LAVATORIES

SPECIFICATION SHEET

TAG LAN-2

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



** WITH STANDARD SLEEVE LENGTH OF 3 1/4 [83].

Product No.	Approx. Wt. Lbs. [kg]
Z1231	45 [20]

ENGINEERING SPECIFICATION: ZURN Z1231 Lavatory support system with concealed arms. Complete with Dura-Coated rectangular steel uprights with welded feet, cast iron adjustable headers, concealed arms, steel sleeves, alignment truss, and mounting fasteners.

OPTIONS (Check/specify appropriate options)

PREFIXES

Z Dura-Coated System with Support Plate*

SUFFIXES

- AL Adapter Lug
- CU Floor to Ceiling Upright (Specify Height Required)
- D Back to Back System
- E2 Concealed Arm Escutcheons 2 [51] Long
- E4 Concealed Arm Escutcheons 4 [102] Long
- E6 Concealed Arm Escutcheons 6 [152] Long
- SL Stud Length Over 3 1/4 [82] (Specify Length)
- WS Wall Support Valve Plate
(Specify Valve Name and Number)
- 79 Paraplegic Rough-in

*REGULARLY FURNISHED UNLESS OTHERWISE SPECIFIED

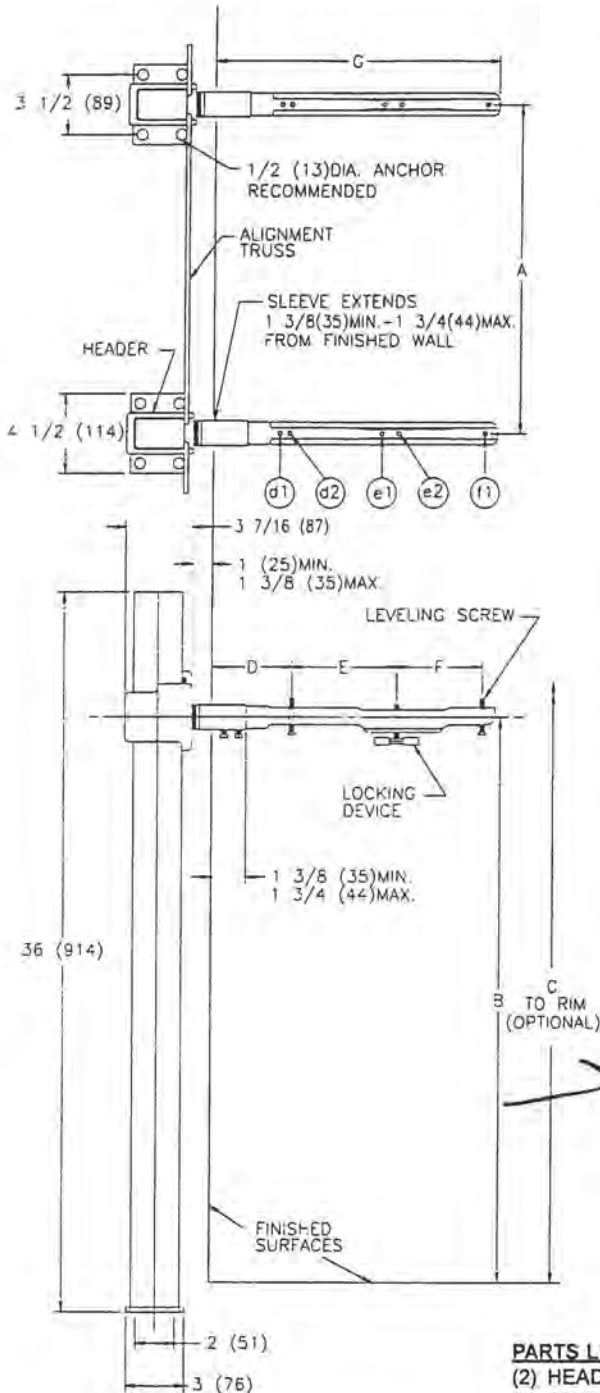
REV. D	DATE: 10/17/02	C.N. NO. 89994
DWG. NO. 58855		PRODUCT NO. Z1231



INSTALLATION SHEET

(TYPICAL INSTALLATION SHOWN)

Z-1231-80



	A	B	C	D	E	F	G	HOLES
American Std. (18 x 15) Penlyn 0372.052 0373.050	14-3/4 (375)	29-1/2 (749)	31 (787)	4 (102)	5 (127)	5 (127)	15 (381)	d2,e1,f1
Crane (20 x 18) Norwich 1-194 1-205 1-206	16-1/4 (413)	29-1/4 (743)	31 (787)	4 (102)	5-5/8 (143)	4-3/8 (111)	15 (381)	d2,e2,f1
Crane (20 x 18) Norwich 1h-193.195,196,197,198,199,201,202,205,206,208,209	16-1/4 (413)	32-1/4 (819)	34 (864)	4 (102)	5-5/8 (143)	4-3/8 (111)	15 (381)	d2,e2,f1
Kohler (19 x 17) * Chesapeake K-1728	15-3/8 (390)	29-1/2 (749)	31 (787)	3-1/4 (83)	5-1/4 (133)	5-1/4 (133)	14-3/8 (365)	d1,e1,f1
Kohler (20 x 18) * Chesapeake K-1729	15-3/4 (400)	30 (762)	31 (787)	3-1/4 (83)	5-1/4 (133)	5-1/4 (133)	14-3/8 (365)	d1,e1,f1
Kohler (20 x 18) Greenwich K-2030 K-2031 K-2032 K-2034 K-2036	17-1/4 (438)	29 (737)	31 (787)	3-1/4 (83)	5-1/4 (133)	5-1/4 (133)	14-3/8 (365)	d1,e1,f1
Kohler (20 x 18) Greenwich K-12643	17-1/4 (438)	29 (737)	31 (787)	3-1/4 (83)	5-1/4 (133)	5-1/4 (133)	14-3/8 (365)	d1,e1,f1
Kohler (21x 18) Kingston K-2005 K-2006 K-2007	17-1/4 (425)	29-1/8 (740)	31 (787)	3-1/4 (83)	5-1/4 (133)	5-1/4 (133)	14-3/8 (365)	d1,e1,f1
Kohler (20 x 18) Soho K-2053 K-2054 K-2084	16-1/2 (419)	29-1/4 (743)	34 (864)	3-1/4 (83)	5-1/4 (133)	5-1/4 (133)	14-3/8 (365)	d1,e1,f1

PARTS LIST:

- (2) HEADER (1) ALIGN TRUSS(24[610])
- (2) ARM (-80) (2) ARM SLEEVE 3 1/4[83]
- (1) BAG #7 ARM BAG (2) LOCKING DEVICE
- (4) MACHINE SCREWS 1/4[6] X 1 3/4[44]
- (1) BAG #120 HEADER BAG (4) SET SCREW 3/8[10] X 1/2[13]
- (1) ALLEN WRENCH 3/8[10] (1) BAG #121 UPRIGHT SET SCREW BAG
- (2) SET SCREW 1/4[6] X 3/4[19] (1) BAG #124 ARM SET SCREW BAG
- (4) SET SCREW 1/4[6] X 3/8[10]

* REQUIRES 2 ADDITIONAL 1/4[6] X 3 1/4[83] LEVELING SCREWS

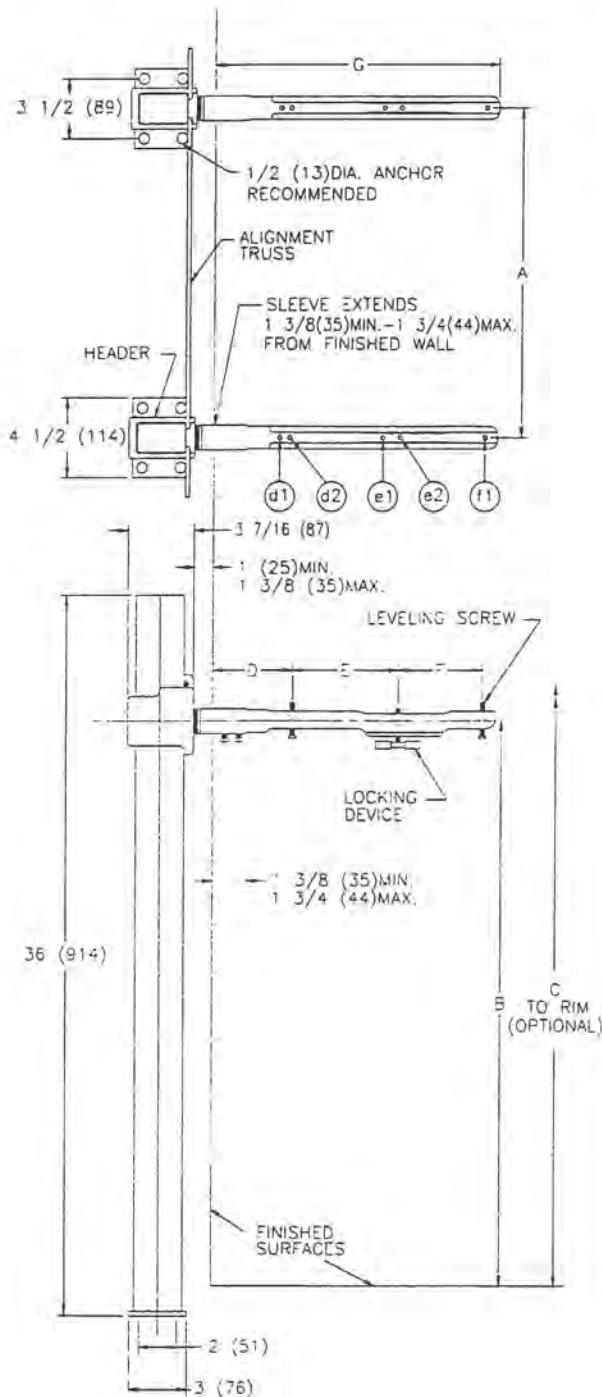
FORM# C5 Date: 8/12/99
C.N. No. 83072 REV. B



INSTALLATION SHEET

(TYPICAL INSTALLATION SHOWN)

Z-1231-80



A	B	C	D	E	F	G	HOLES
American Std. (21-1/4 X 22)							
Murro 0954.000,0958.000,0955.000							
16-3/4	32-1/4	34	4	6	4	14-3/4	d2,e1,f1
(426)	(819)	(864)	(102)	(153)	(102)	(375)	

PARTS LIST:

- (2) HEADER (1) ALIGN TRUSS(24[610])
- (2) ARM (-80) (2) ARM SLEEVE 3 1/4[83]
- (1) BAG #7 ARM BAG (2) LOCKING DEVICE
- (4) MACHINE SCREWS 1/4[6] X 1 3/4[44]
- (1) BAG #120 HEADER BAG (4) SET SCREW 3/8[10] X 1/2[13]
- (1) ALLEN WRENCH 3/8[10] (1) BAG #121 UPRIGHT SET SCREW BAG
- (2) SET SCREW 1/4[6] X 3/4[19] (1) BAG #124 ARM SET SCREW BAG
- (4) SET SCREW 1/4[6] X 3/8[10]

* REQUIRES 2 ADDITIONAL 1/4[6] X 3 1/4[83] LEVELING SCREWS

FORM# C5 Date: 8/12/99
C.N. No. 83072 REV. B

L-3 LAVATORY

L-3 LAVATORY

KOHLER K21964WH WHITE 20X17 *PENNINGTON 4 VC LA
SYMMONS SS20 SGL LEV LAV FCT ONLY CP
KEENEY KE5700PC CP OFFSET GRID DRAIN
PROFLO PF8617COH 1-1/4 17 GA CP P TRAP W/ CO
PROFLO PF202WH WHITE 3 PC P TRAP & SUPPLY COVER
BRASSCRAFT BSR19C CP 1/2 SWT X 3/8 COMP ANGLE ST LK
BRASSCRAFT B112AC CP 3/8X12 1PC LAV RSR
PROFLO PFE7 5/8 OD ESC CP

FEATURES

- 20-1/4" (51.4cm) x 17-1/2" (44.5cm)
- Vitreous china
- Self-rimming
- 4" (10.2cm) centers
- With overflow
- ADA compliant when installed in a 21" (53.3cm) minimum depth countertop
- With sealant
- Optional soap dispenser hole on left (-L) or right (-R)

→ **K-2196**

ADA



CODES/STANDARDS APPLICABLE

Specified model meets or exceeds the following:

- ADA
- ASME/ANSI A112.19.2M
- CABO/ANSI A117.1
- IAPMO/UPC
- Canadian Standards Association (CSA)
- State of Massachusetts

COLORS/FINISHES

- 0 White
- Other Refer to Fixtures Price Book for additional colors

Accessories:

- CP Polished Chrome
- Other Refer to Faucets Price Book for additional finishes

SPECIFIED MODEL:

Model	Description	Colors/Finishes	
K-2196-4	4" (10.2cm) centers lavatory less soap dispenser hole	<input checked="" type="checkbox"/> 0 White	<input type="checkbox"/> Other_____
K-2196-4L	4" (10.2cm) centers lavatory with soap dispenser hole on left	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other_____
K-2196-4R	4" (10.2cm) centers lavatory with soap dispenser hole on right	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other_____
K-2196-4N	4" (10.2cm) centers lavatory less soap dispenser hole, less overflow	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other_____
K-2196-4K	4" (10.2cm) centers lavatory with soap dispenser hole on left, less overflow	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other_____
K-2196-4F	4" (10.2cm) centers lavatory with soap dispenser hole on right, less overflow	<input type="checkbox"/> 0 White	<input type="checkbox"/> Other_____

Recommended Accessories			
K-8998	Trap	<input type="checkbox"/> CP	<input type="checkbox"/> Other_____

PRODUCT SPECIFICATION:

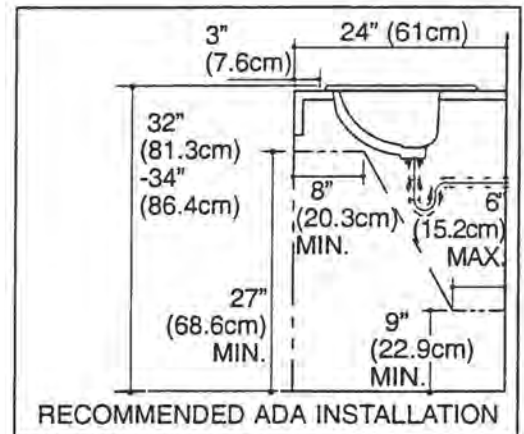
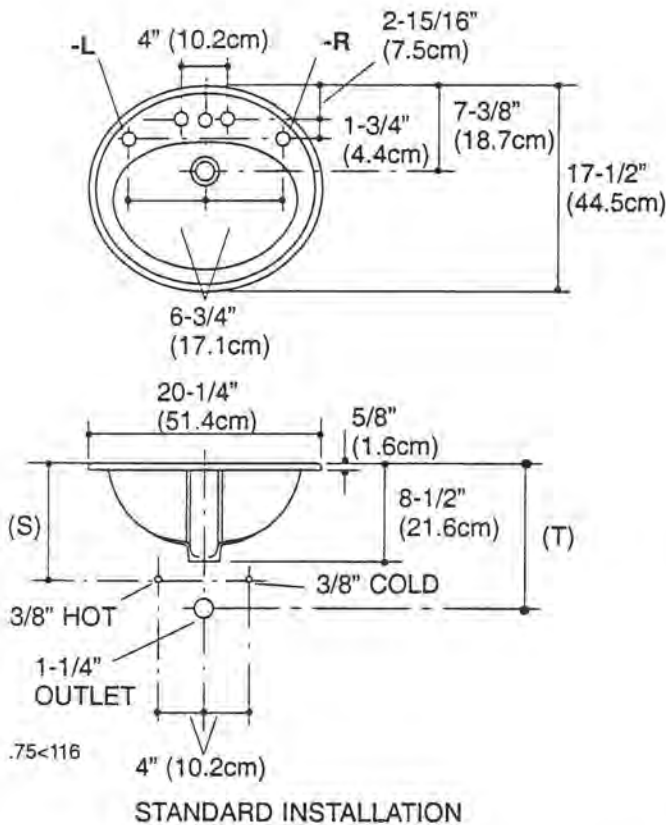
The self-rimming lavatory shall be 20-1/4" (51.4cm) in length, and 17-1/2" (44.5cm) in width. Lavatory shall be made of vitreous china. Lavatory shall have 4" (10.2cm) centers drilling. Lavatory shall have overflow. Lavatory shall be ADA compliant when installed in a 21" (53.3cm) minimum depth countertop. Lavatory shall include sealant. Lavatory shall have optional soap dispenser hole on left (-L) or right (-R). Lavatory shall be Kohler Model K-2196-_____.

PRODUCT INFORMATION

ADA compliant.			
Fixture*:		basin area	water depth
Lavatory		16" (40.6cm) x 11" (27.9cm)	4" (10.2cm)
Drain Hole	1-3/4" D. (4.4cm)		
* Approximate measurements for comparison only.			
Spout hole	Faucet hole	Soap dispenser hole	
1-1/4" D. (3.2cm)	1-1/4" D. (3.2cm)	1-1/4" D. (3.2cm)	
Included Components:			
Adhesive sealant			63034
Cutout template			113805-7

INSTALLATION NOTES

Install this product according to the installation guide.
 Fixture dimensions are nominal and conform to tolerances in
 ASME Standard A112.19.2M.



(T) Pop-up drain 14-1/8" (35.9cm), grid drain 13-1/4" (33.7cm).

(S) 10" (25.4cm) Supply (Based on 12" (30.5cm) riser which may require cutting).

PRODUCT DIAGRAM

SYMMETRIX® Single Handle Lavatory Faucet

(Replaces Temptrol® S-90 Series Lavatory Faucet)

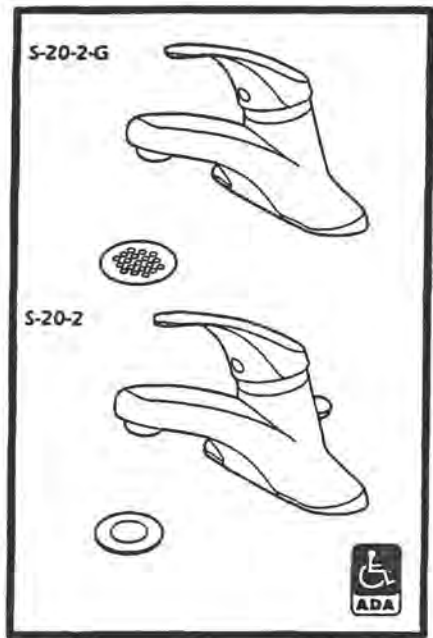
- S-20-2-G: With grid strainer drain assembly
- S-20-2: With lift rod and pop-up drain assembly
- S-20-1: With lift rod only
- S-20-0: Faucet only (no lift-rod hole)
- S-20: Faucet only (with lift-rod hole)

Symmetrix Single Lever Lavatory Faucet with ceramic control components, handle limit stop, and red/blue indicators on handle. Aerator, 3/8" supplies, 4" centers, metal construction, polished chrome finish.

Modifications:

Add:

- Suffix LP: Loop handle
- Suffix W: 6" lever handle
- Suffix OFG: Offset grid strainer
- Suffix FR: 0.5 gpm flow restrictor outlet spray (vandal resistant)
- Suffix VP: Vandal resistant aerator
- Suffix IPS: 1/2" IPS connections
- Suffix LST: 1/6" copper supply tubes
- Suffix NA: Non-aerated, laminar flow outlet
- Suffix AWT: White finish
- Suffix BRS: Radiance® polished brass finish
- Suffix PCB: Polished chrome and Radiance® polished brass finish
- Suffix STN: Satin finish



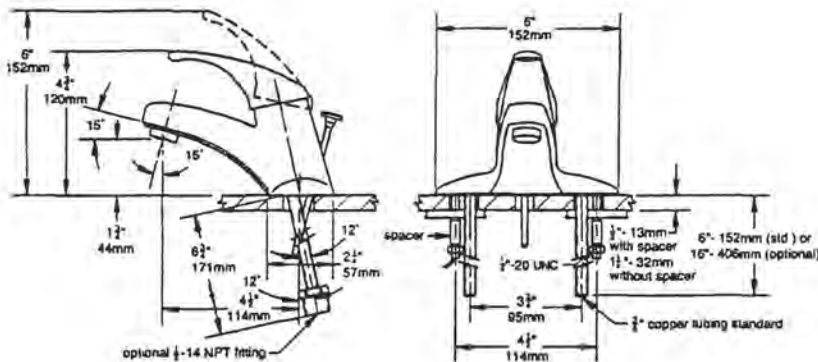
SYMMONS PRODUCTS MEET
ANSI A112.18.1M, EPA '92
AND ALL KNOWN FLOW RATE
REQUIREMENTS.
Kitchen and Lavatory Faucets
2.0 GPM (7.6 L/min)

Job/Location

Engineer

Contractor

For ADA compliance (Americans with Disabilities Act) consult ADAAG or your state regulations for proper product choice and mounting locations.



SYMMONS INDUSTRIES, INC.
31 Brooks Drive, Braintree, MA 02184-3804
TEL: 1-800-SYMMONS, (781) 848-2250 FAX: 1-800-961-9621, (781) 843-3849
Web site: www.symmons.com

© 2001 Symmons Industries, Inc. 12/01



Replaced ladies restroom off gym (112e) 10/23/14

SYMMONS® Symmetrix®

Lavatory Faucet S-20 Series

S-20-0-1.5

Installation and Service Instructions



Installation

Caution: Be sure to turn off hot and cold water supplies before installing or servicing faucet.

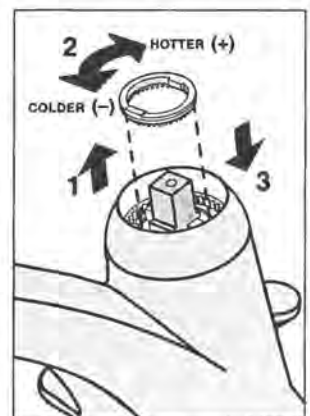
- Loosely install the anchor bar (KN-23), spacer (KN-26) and nut (L-36) on the mounting bolts and place gasket on base of faucet. Push faucet supplies and anchor bolt/spacer/nut assemblies with gasket through holes in sink. Secure faucet to sink by tightening nuts from underside. (If sink or counter surface is uneven, use putty or sealant to make proper seal under base.)
- Connect hot supply to left tube and cold supply to right tube using appropriate connectors.
- Pop-up drain installation:
 - Remove pop-up plug, tail piece and flange from the drain body. Make sure that locknut is threaded all the way down onto the body with flat friction washer in middle and beveled washer on top.
 - Apply plumbers putty or sealant to bottom of flange.
 - Install drain body through drain opening in lavatory and screw flange onto the drain body making sure that the threads are completely engaged for proper sealing and strength of the connection. Apply joint compound to all threaded parts to insure proper seal. Apply putty or teflon tape to tail piece before attaching to drain body.
 - Tighten locknut to compress the beveled flange evenly across the bottom of the drain opening taking care not to over tighten the locknut, causing damage to the lavatory.
 - Remove one of two ball washers from inside the threaded cavity. Insert pop-up plug and pivot rod into body. Add one ball washer (the second ball washer should remain inside the body) to the outside of the ball. Tighten the retaining nut until the ball is seated on the internal and external ball washers.

Note: The pop-up plug can be installed either in the removable or non-removable position, depending on the location of the hole located in the guide at the bottom of the plug.
 - Slide the pivot rod through one side of the spring clip, then the appropriate adjustment hole and then other side of the spring clip.
 - Insert lift rod through faucet housing and the top of the lift strap and secure it in place by tightening the screw.

Note: To ensure proper operation of lift rod and pop-up, some adjustment of the linkage may be required. There are two possible adjustment points: 1) lift strap to lift rod and 2) lift strap to pivot rod.
- It is very important to thoroughly flush the supply lines to prevent foreign matter, i.e. copper chips, sand, stones, etc. from damaging the sealing surfaces of cartridge.

Remove aerator and turn valve handle on to full cold position, open cold supply. Without closing, turn handle to full hot and open hot supply. Let water run in hot only and cold only positions long enough to flush supply lines thoroughly. Shut off faucet and replace aerator. Check for leaks.

- The handle limit stop can be set to limit handle turn to the hot position. The limit mechanism is factory set to allow full handle travel. To adjust the limit stop, turn handle to the full hot position and lift handle to open faucet approximately half way to obtain a smooth flow for correct initial temperature measurement.



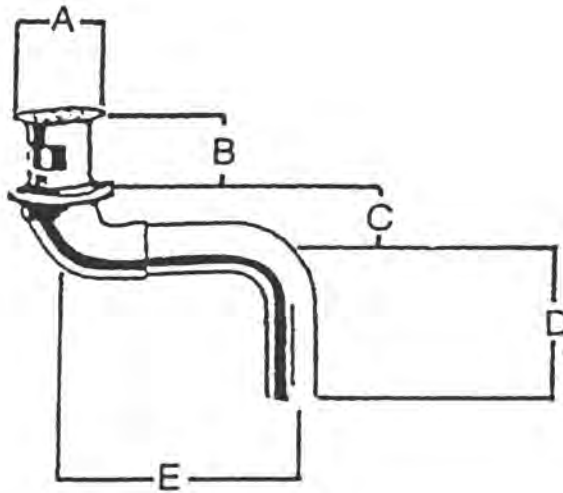
- If when faucet is on and in full hot position and water is too hot, remove plug button (KN-157), loosen set screw (L-22) and remove handle (KN-3RB, KN-3BRB or LN-135). Lift limit stop ring (KN-4L) using a small flat head screw driver and rotate counter clockwise to lower temperature. If water is not hot enough, rotate clockwise (See Figure 1 on reverse side). After correct temperature is achieved, reattach handle, reversing procedure above.

Replacing cartridge (KN-4)

- Remove plug button (KN-157), loosen set screw (L-22) and remove handle (KN-3RB, KN-3BRB or LN-135).
- Engage tabs in cartridge wrench (LN-34) with slots in compression ring (KN-2) and use screwdriver in wrench holes or pliers on wrench and turn counter clockwise until compression ring engages with cap (LN-8). Continue turning counter clockwise so that cap/ring assembly is removed from the body (LN-371). Remove cartridge and three ring seal (KN-4).
- Install new cartridge while taking care to maintain position of the three ring seal at the base of the cartridge. Match posts in base of cartridge with alignment holes in valve body during assembly.
- Reassemble faucet in reverse fashion. Thread cap onto body firmly by hand. Do not use a wrench which may damage the finish. Tighten compression ring (KN-2) finger tight using the wrench (LN-34) then 1/4 to 1/2 turn further.
- Set hot water limit stop in accordance with installation step 5 above.

KEENEY

SPECIFICATION SHEET

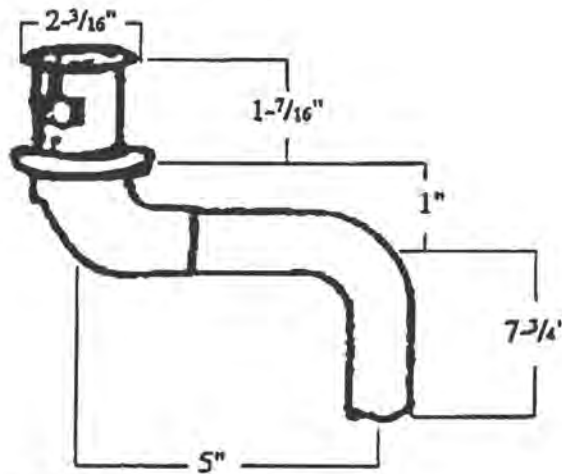


Catalog No.

Dimensions

	A	B	C	D	E
5700PC	2 3/16"	1 7/16"	1"	7 3/4"	5"

THE KEENEY MANUFACTURING COMPANY

PRODUCT INFORMATION SHEET**K****THE KEENEY MANUFACTURING COMPANY****Lavatory Strainer****5700PC****FEATURES:**

- **Chrome Plated**
- **Cast Brass Plug with Strainer and Drain assembly**
- **17 Gauge Tailpiece**

Contact Your Nearest Representative At: **The Keeney Manufacturing Company**
1170 Main Street • Newington, CT 06111 • 1-800-243-0526 • Fax # (203) 665-0374



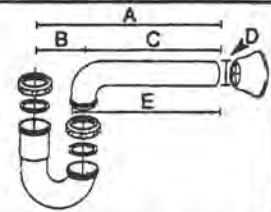
Commercial Product Information and Specifications

MODEL	DESCRIPTION
PF8617H	1 1/4" 17 Gauge CP P-Trap
PF8617HJ	1 1/4" X 1 1/2" 17 Gauge CP P-Trap
PF8617J	1 1/2" 17 Gauge CP P-Trap

- 17 gauge
- Chrome plated
- Deep pattern steel flange
- Solid brass, chrome plated nuts

SPECIFICATIONS

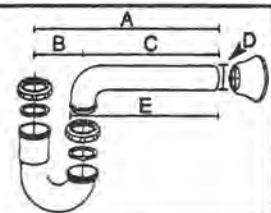
PF8617H	PF8617HJ PF867J
A: 11"	12"
B: 3 1/4"	3 1/4"
C: 7 3/4"	8 3/4"
D: 1 1/4"	1 1/2"
E: 8"	9"



PF8620H	1 1/4" 20 Gauge CP P-Trap
PF8620J	1 1/2" 20 Gauge CP P-Trap

- 20 gauge
- Chrome plated
- Deep pattern steel flange
- Zink die cast nuts

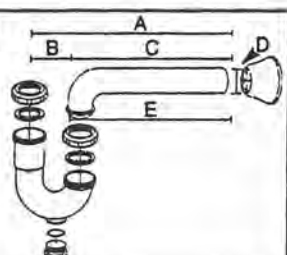
PF8620H	PF8620HJ
A: 11"	12"
B: 3 1/4"	3 1/4"
C: 7 3/4"	8 3/4"
D: 1 1/4"	1 1/2"
E: 8"	9"



PF8617COH	1 1/4" 17 Gauge CP P-Trap
PF8617COHJ	1 1/4" X 1 1/2" 17 Gauge CP P-Trap
PF8617COJ	1 1/2" 17 Gauge CP P-Trap

- 17 gauge
- Chrome plated
- Deep pattern steel flange
- Solid brass, chrome plated nuts
- With cleanout

PF8617COH	PF8617COHJ PF8617COJ
A: 11"	12"
B: 3 1/4"	3 1/4"
C: 7 3/4"	8 3/4"
D: 1 1/4"	1 1/2"
E: 8"	9"



SUBMITTAL SHEET

PRODUCT DESCRIPTION

TRAP COVERS waste and supply piping covers satisfy ADA compliance requirements with its unique and universal design, allowing for easy installation over virtually all tubular and cast brass P-trap assemblies, as well as angle valve and supply tube assemblies, regardless of their geometry or rotational offset. Smooth, flush Snap Clip™ fasteners firmly secure piping covers in place.

SAMPLE SPECIFICATIONS

Handicap lavatory P-trap and angle valve assemblies shall be covered with the soft, antimicrobial, TRAP COVERS piping covers sold by PROFLO™

Model # **PF202WH**, Accessory # **PF205WH**
 Piping cover shall be secured with Snap Clip™ flush mounted fasteners. Angle stop valve shall be secured with locking lid access cover. Cover shall be white, non-yellowing and fire retardant.



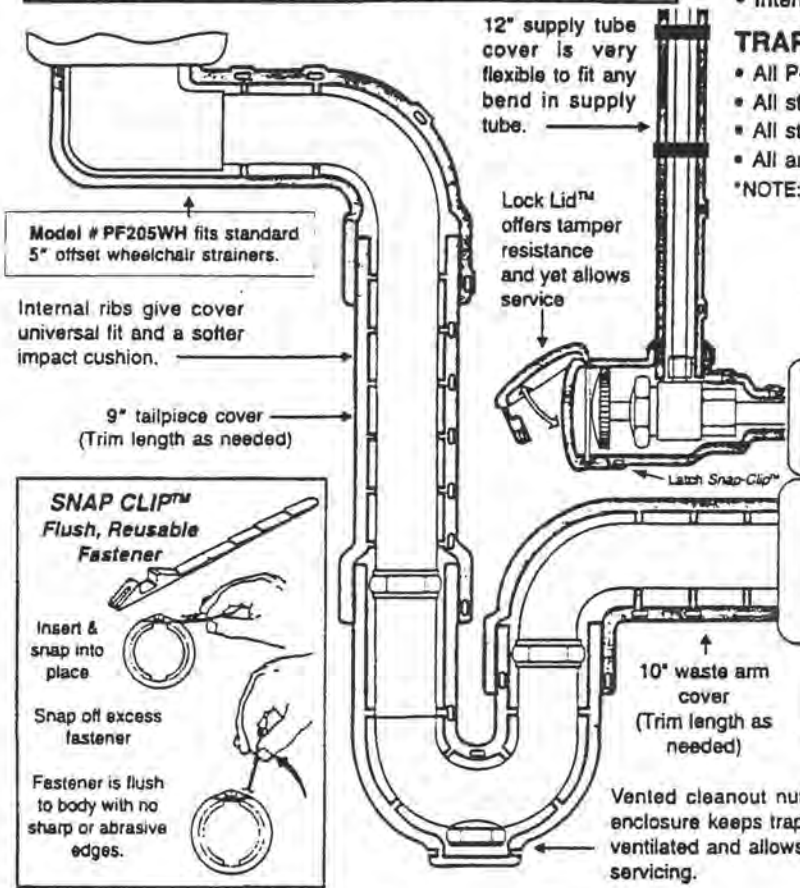
TRAP COVERS™

DESIGN FEATURES

- Universal design fits virtually all lavatory applications
- Antimicrobial vinyl maintains sanitary conditions
- Lock Lid™ on valve stops tampering & allows service
- Cleanout nut cap allows service on trap without disassembly
- Snap-Clip™ fastener is flush, nonabrasive & reusable
- Internal ribs enhance K valve & soften impact cushioning

TRAP COVERS KITS FIT:

- All P-trap assemblies, cast brass or tubular - 1 1/4" or 1 1/2"
 - All straight tail piece assemblies - 1 1/4" or 1 1/2"
 - All standard 5" offset wheelchair strainers. (Model # PF205WH)
 - All angle stop valves - handled or keyed type 3/8" or 1/2"
- *NOTE: TRAP COVERS Kits will not fit Schedule 40 plastic P-traps.



Models Available:

Color: White

Select model.

- Model #PF200WH
One P-trap cover.
- Model #PF201WH
One P-trap cover, one angle valve and one 12" supply cover.
- Model #PF202WH
One P-trap cover, two angle valve covers, and two 12" supply covers.
- Model #PF203WH
One P-trap cover, two angle valve covers, two 12" supply covers, one 5" offset tailpiece wheelchair strainer cover.
- Model #PF205WH
One 5" offset tailpiece wheelchair strainer assembly.
- Model #PF299WH
One angle valve and one 12" supply cover.
- Extension #PFEX299WH
One 16" extension for water supply.
- Extension #PFEX200WH
One 16" extension for drain waste arm or tailpiece.

MATERIAL:	MOLDED CLOSED CELL VINYL
NOM. WALL:	1/8 INCH CONSTANT
DUROMETER:	55 - 65 - SHORE A
UV PROTECTION:	WILL NOT FADE OR DISCOLOR
DURABILITY:	VIRTUALLY INDESTRUCTIBLE
FASTENERS:	SNAP-CLIP™, FLUSH, REUSABLE
COLOR:	WHITE
PAINTABILITY:	APPLY ACRYLIC ENAMEL
BURNING CHARACTERISTICS ASTM D 635:	SELF-EXTINGUISHED 5 SEC (ATB) 10 MM (AEB)
THERMAL CONDUCTIVITY ASTM C 177:	BTU - IN/HR - FT² · °F K VALUE = 1.17
BACTERIA/FUNGUS RESIST:	ANTIMICROBIAL VINYL FORMULA
MAINTENANCE:	USE COMMON DETERGENTS



LAV GUARD
 CLASSIFIED BY
 UNDERWRITERS LABORATORIES INC.*
 IN ACCORDANCE WITH ADA article 4.19.4
 22FF



Approved By: _____

Made in U.S.A.



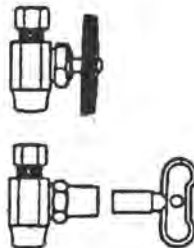
Brass Craft, Product Specifications Guide

STOP

OVAL HANDLE STYLE

Use:	Supply stop for potable water distribution systems.
Operating Pressure:	125 psi maximum
Operating Temperature:	40 - 140°F Intermittent to 180°F
Material Specifications:	<p>Body and other brass components – C36000 brass.</p> <p>Stem – C36000 brass or polymer.</p> <p>Washers – Bib and packing washers, Nitrile or EPDM rubber.</p> <p>Handle – Die cast metal or Polycarbonate plastic.</p>
Designed and Manufactured In Accordance With:	<p>ANSI A112.18.1M</p> <p>Canadian Standard CAN/CSA-B125-M93</p>
Approvals/Listings:	<p>IAPMO File #645 – Except Dual-Outlet Except valves with inlet connection to PEX pipe. Dual-Shutoff valves are IAPMO listed.</p> <p>IAPMO File #C-3678 – Valves with inlet connection to PEX pipe. CSA Approved – Except valves with inlet connection to PEX pipe.</p>

1/2" X 3/8" LOOSE KEY ANGLE STOP

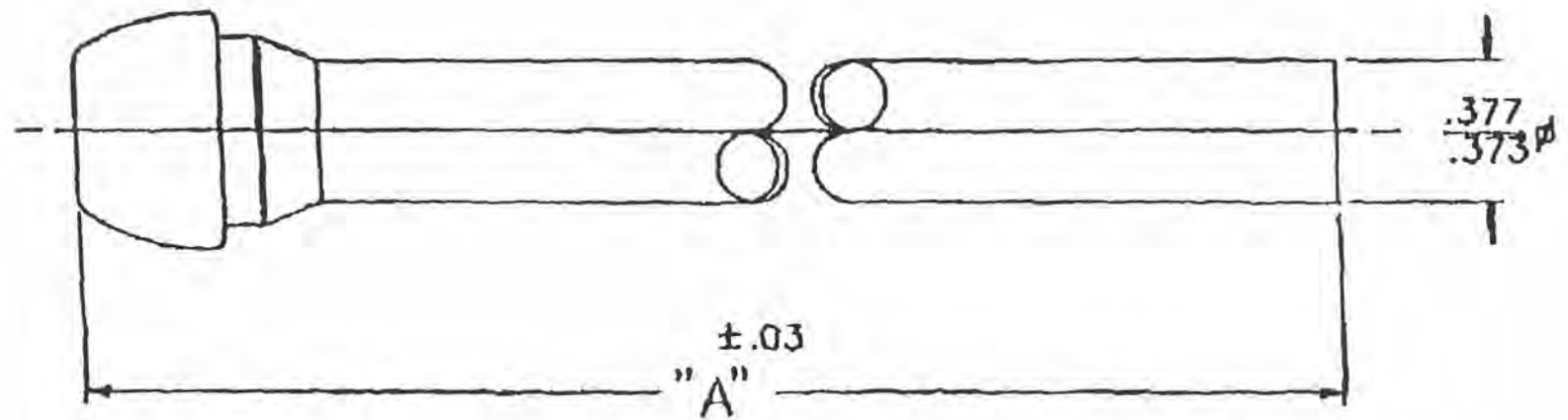


October 14, 1997

FERGUSON

ITEM ID SEE CHART	ITEM DESCRIPTION SEE CHART	DRAWING NO. RPA0052B
-----------------------------	--------------------------------------	--------------------------------

REV.	DATE	PER	BY	CHANGE
A	8/21/88	UK	ROG	RELEASE FOR PRODUCTION
B ₁	10/25/93	HKK	AWK	REVISED "A" LENGTH DIM'S
B ₂	10/25/94	HKK	AWK	ADDED MAT'L INFO.
B ₃	10/25/96	HKK	AWK	ADDED "INSTALLATION" TO DESCH.



PART NO:	ITEM I.D.	"A" DIM
1-12A	230000	11.63
1-15A	230030	14.63
1-20A	230060	19.63
1-30A	230090	29.63
1-36A	230120	35.63

Brass Craft.
 NOV, MICHIGAN
 A Subsidiary of Mosco Corporation

CLASSIFICATION AND ACCEPTABLE QUALITY LEVELS	FINISH	CLASS
	⊕	CRITICAL
	⊖	MAJOR
	NONE	SIGNIFICANT

DESCRIPTION LAVATORY SUPPLY TUBE INSTALLATION DRAWING		MATERIAL CA122 COPPER		SCALE: 2:1		DRAWING NO. RPA0052B	
				DATE: 6/21/94	REV. B		
NOTE: UNLESS OTHERWISE SPECIFIED TWO PLACE DECIMALS THREE PLACE DECIMALS ANGULARITY		TOL. WT./IN FIN. WT./IN		DATE: 10/25/96	ITEM DESCRIPTION SEE CHART		ITEM ID SEE CHART
				DATE	SEE CHART		A SIZE

PROFLO™

Standard Type



Chrome plated steel.

No.	Size In.
Iron Pipe Sizes	
PFE1	3/8
PFE2	1/2
PFE8	3/4
PFE9A	1
PFE10	1 1/4
PFE11	1 1/2
PFE16A	2
Polished Brass	
PFE2PB	1/2
Copper Tube Sizes	
PFE7	5/8 OD (1/2 CTS)
PFE9	7/8 OD (3/4 CTS)
Polished Brass	
PFE7PB	5/8 OD (1/2 CTS)

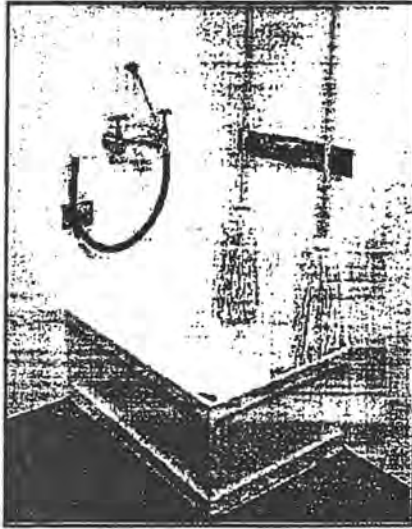
MSB-1 MOP BASIN

MSB-1 MOP BASIN

FIAT FMSB2424 24X24X10 MOP BASIN W/ 3 DRN

FIAT

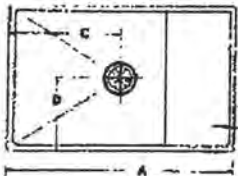
Mop Service Basins



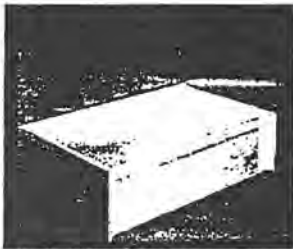
- Weighs 80% less than Terrazzo
- Stronger than stone
- Easy to handle and install
- Stainproof, stays cleaner
- Crashproof, extra thick shoulders
- Can withstand boiling water
- Unaffected by normal cleaning chemicals
- Finished on all four sides

These rugged molded stone mop service basins are manufactured from the SMC process under the highest quality standards. The quality control molding is achieved in matched metal dies under intense heat and pressure with the result being a one-piece, dependable homogenous product. Color: White

The unit shall be 10" (254) high walls with not less than 1" (25) wide shoulders and an integrally molded shelf 10⁹/₁₆" (268) wide (on the MSB-3624 only). The factory installed drain body shall be stainless steel and designed to provide for a lead caulk or QDC-3 joint connector for a 3" (76) drainpipe. A combination dome strainer and stainless steel lint basket is included.



MODEL	A	B	C	D	E
MSB-2424	24	24	12	12	10
	610	610	305	305	254
MSB-3624	36	24	18	12	10
	914	610	457	305	254



Wall Guard

For use with either Molded-Stone or Terrazzo Mop Basins, made of heavy gauge stainless steel. Designed and is used to protect walls adjacent to the receptor. Two panels are supplied for corner installations, a third panel is required for a recessed installation. The wall guard models are identified as follows: MSG-2424, MSG-3232, MSG-3624, and MSG-3636



832-AA - Hose & Bracket

30" (762) long flexible heavy duty 5/8" (16) rubber hose, cloth reinforced with 3/4" (19) chrome coupling at one end. Bracket is 5" (127) long x 3" (76) wide stainless steel with rubber grip.



830 AA - Service Faucet

Wall mounted fitting. Chrome plated with vacuum breaker, integral stops, adjustable wall brace, pail hook and 3/4" (19) hose thread on spout. Body inlets 8" (203) center to center, four arm handles.



1239 BB - Aluminum Bumper Guard For Terrazzo mop basins



1453-BB - Alternate Strainer Flat type stainless.

*Custom order: Vandal-proof drains available; **MUST** specify when ordering base, **not** available separately.



889 CC - Mop Bracket

24" (610) long x 3" (76) wide, stainless steel with three (3) rubber tool grips



Quick Drain Connectors

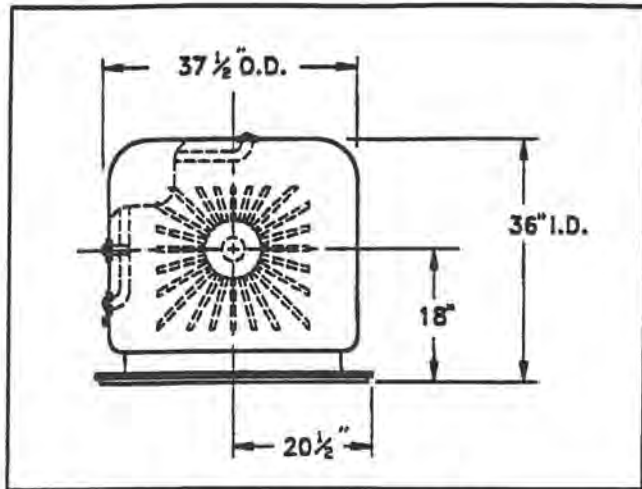
For use with	QDC 3.2	QDC 3SN	QDC 3XH	QDC 4
Cast Iron Soil Pipe	•	•	•	•
P.V.C.	•		•	•
Sched 40 D.W.V.				
Steel Sched 40	•		•	•

SH-1 SHOWER

SH-1 SHOWER

AQUABATH AIS4136SH AQUABATH AIS4136SH

SYMMONS SS961 TEMPTROL SHWR VLV CP

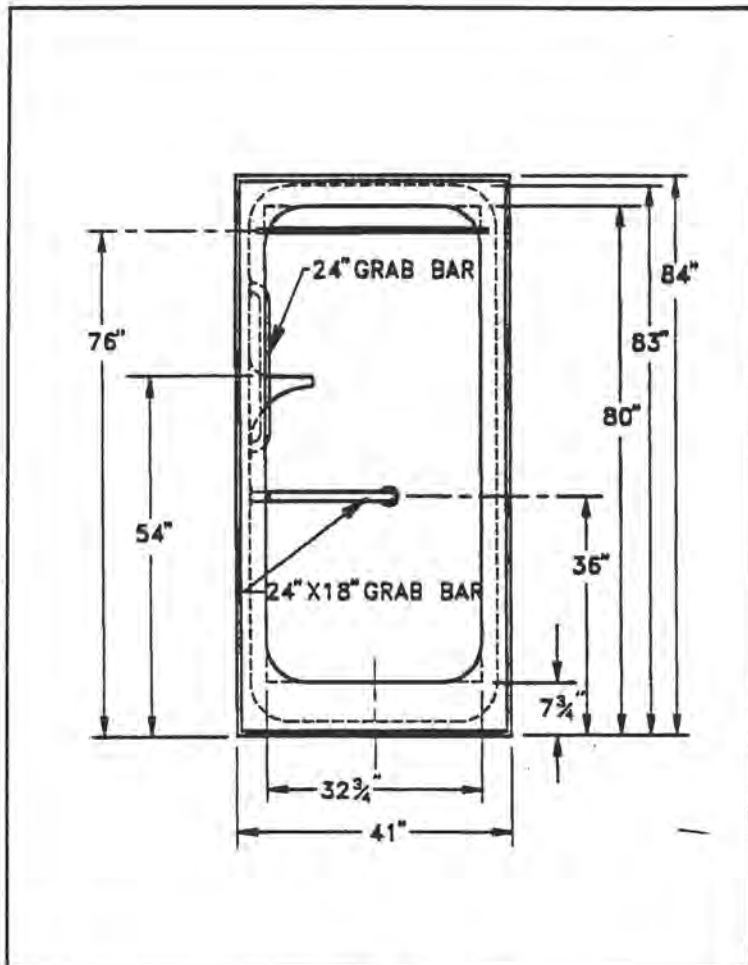


Top View - Left Hand Shown

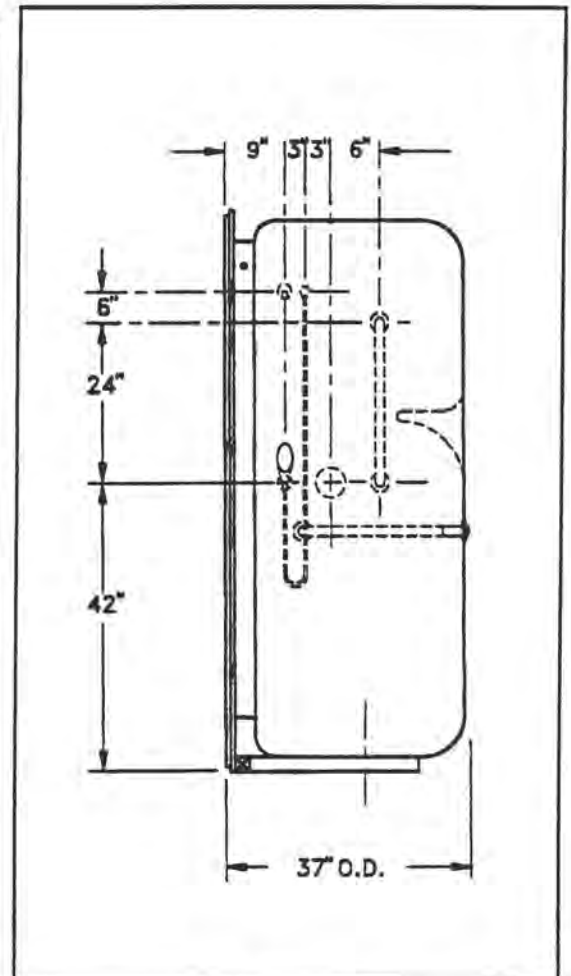


For additional information call the Aqua Bath Customer Service Department, 1-800-232-2284

**Accessible Series
SUBMITTAL DATA
IS4136SH**



Front View



Right Side View

Installation: Detailed installation instructions are contained in this catalog, and provided with each unit shipped. The field installation instructions must be followed as directed.

Applicable installation details can be found on pages: ID-1, ID-6 & ID-10.

ACCESSIBLE SERIES

- Model IS4136SH-L: valve on left
- Model IS4136SH-R: valve on right
- Bath units designed for hospitals, nursing homes, assisted living rehabilitation centers, hotels, motels and residential applications.
- Meets ANSI Z124.2 standards for accessibility.
- Acrylic one-piece molded construction simplifies installation.
- Inside dimensions: 36"W x 36"D x 78"H.
- Includes stainless grab bars with mounting plates and curtain rod.
- Can be furnished complete with valve, hand held shower set, curtain and hooks.
- 7 3/4" threshold, also available with 4" threshold
- Shower brackets



For additional information call the Aqua Bath Customer Service Department, 1-800-232-2284

The IS4136SH, as shown, is **NOT** ADA compliant. Please see Aqua Bath full line of ADA compliant showers and tub/shower units.

TRANSFER SHOWER STALL

The shower enclosure shall be Aqua Bath Model IS4136SH acrylic and be molded from a single sheet of acrylic so as not to have any joints or seams, shall meet ANSI Z124.2, and shall have a backside flame spread of less than 30. Shall be designed to meet NAHB. The unit shall have inside dimensions of 36" x 36" x 78" and outside dimensions of 41" x 37" x 84". The approximate weight of the unit shall be 180 lbs. A soap tray shall be molded in the corner 54" above the floor. The option of a factory installed fold up seat adds 3/4" to outside width.

The enclosure shall be pre-drilled and equipped with the following factory installed accessories: 1) One 24" x 18" wrap around and one 24" straight x 1 1/2" diameter, 18 gauge stainless steel grab bar with 1 1/2" safety statute clearance, mounted with stainless steel bolts and secured from the rear with 3" x 3", 11 gauge metal mounting plates, 2) two wall brackets installed at 42" and 72" above floor for handheld shower, 3) 1" diameter 18 gauge stainless steel curtain rod, 4) After grab bars, wall brackets, and curtain rod have been factory installed, they will be sealed from backside making the unit completely waterproof, 5) Ribbed floor for slip resistance, 6) Self caulking brass drain with stainless steel strainer (not installed).

Available options: 1) Factory drilled for a dome light (light shipped separately), 2) Hand held shower set (includes: hand set, 60" flex hose, swivel connector, vacuum breaker, brass nipple, lock nut and shower wall outlet), 3) 24" or 30" slide bar, 4) Pressure balance or thermostatic control valve, 5) White shower curtain, antibacterial, with hooks, 6) Seat belt, 7) Dial thermometer, 8) Factory installed fold up seat, which add 3/4" to outside width, 9) Convertible seat and backing, 10) Available with 4" threshold to better accommodate assisted living projects.

Modifications:

Received and/or approved by:

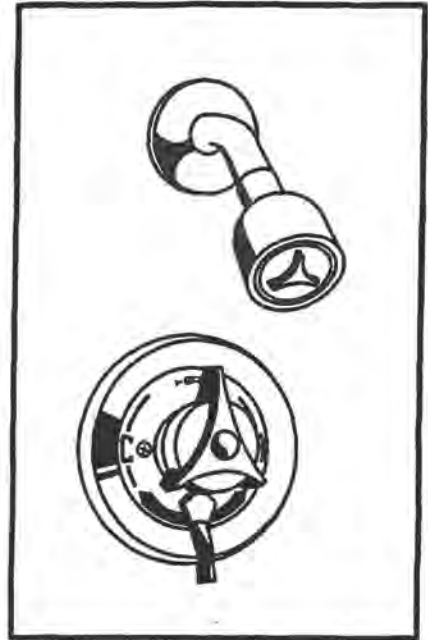
S-96-1 Temptrol® Shower System

Temptrol Pressure-Balancing mixing valve with integral volume control and adjustable stop screw to limit handle turn. Clear-Flo shower head with arm and flange.

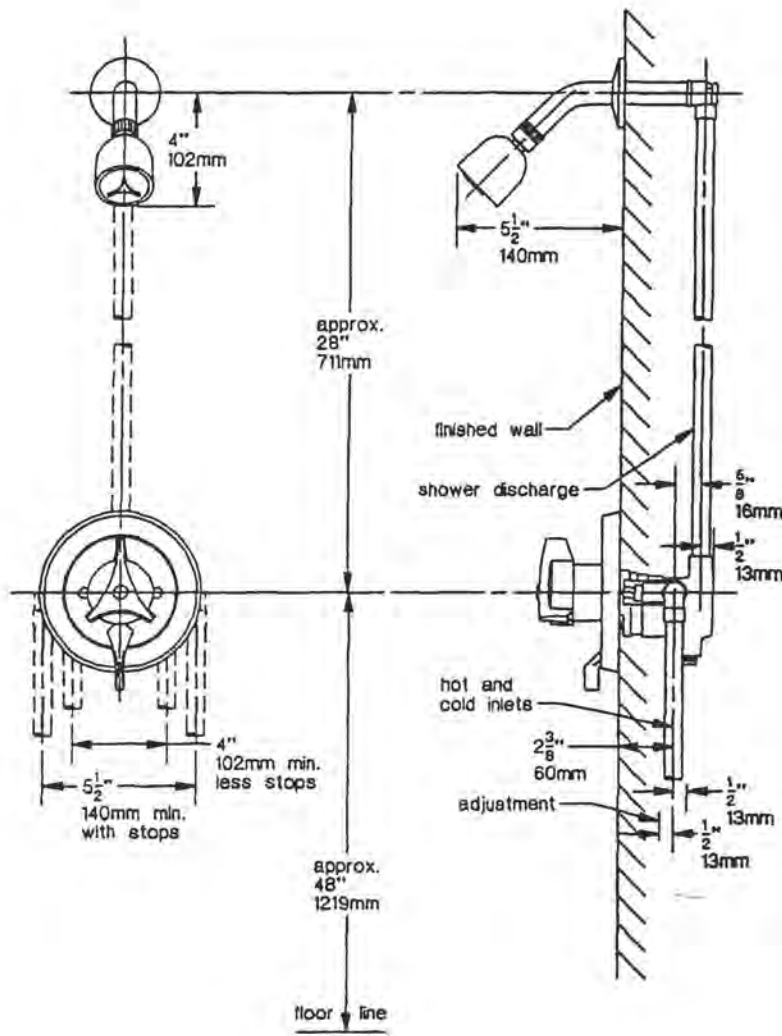
Modifications:

Add:

- Suffix X: Integral service stops - allows water shutoff at valve for service.
- Suffix L: Lever handle.



**SYMMONS PRODUCTS MEET
ANSI A112.18.1M, EPA '92
AND ALL KNOWN FLOW RATE
REQUIREMENTS.**
Showerheads and Hand Showers
2.5 GPM (9.5 L/min)



Job/Location

.....
.....

Engineer

.....
.....

Contractor

.....
.....

This drawing to be used for rough-in installation only. All floor to center dimensions optional. Concealed piping and fittings not furnished by manufacturer. For ADA compliance (Americans with Disabilities Act) consult ADAAG or your state regulations for proper product choice and mounting locations. For complete installation, adjustment and service information, see installation instructions.

SYMMONS INDUSTRIES, INC.
31 Brooks Drive, Braintree, MA 02184
TEL: 1-800-SYMMONS, (781) 848-2250 FAX: 1-800-961-9621, (781) 843-3849
website: www.symmons.com

©1998 Symmons Industries, Inc. Printed in U.S.A.



EWC-1 ELECTRIC WATER COOLER

EWC-1 ELECTRIC WATER COOLER

ELKAY EEZSTLR8 8 GAL BI LVL ADA WTR COLR

BRASSCRAFT BSR19C CP 1/2 SWT X 3/8 COMP ANGLE ST LK

PROFLO PF8617COH 1-1/4 17 GA CP P TRAP W/ CO

Two Station Wall Mount Water Coolers
Barrier-Free Access (Adult and Child)
ANSI/NSF61 Compliant
Models EZTL8C, EZSTL8C and EZSTLDDC



SPECIFICATIONS

GENERAL

Self-contained, wall hung electric refrigerated water cooler. Chilling capacity of 50°F drinking water, based upon 80°F inlet water and 90°F ambient.

Model EZSTL8C has self-closing Easy-Touch Controls on front, left and right of each unit.

Model EZTL8C has self-closing Easy-Touch Controls on the front of each unit.

Model EZSTLDDC non-refrigerated. Same as EZSTL8C without cooling system.

All models have a hooded stream projector with Easy-Touch Controls that require less than 3 pounds of force to activate commercial-grade solenoid based flow control. Patented* valve with built-in flow regulator provide constant stream from 20 to 105 psi water pressure. Bubbler orifice fully protected to meet all sanitary codes.

This model cooler consists of a refrigerated lower unit which requires a water supply, drain outlet and electrical supply.

ADA COMPLIANT

These Water Coolers comply with the requirements of A.D.A. (Americans with Disabilities Act) when properly installed. Unit is compliant if installed in an alcove and is also compliant when mounted on an exposed wall if a wing wall is located on the left side or if LKAPREZL apron is installed under upper unit. Also meets the guidelines for children's environments providing the floor to orifice height is 30" or less on the lower unit and proper clear floor space is provided for parallel approach. (Based on Architectural and Transportation Barriers Compliance Board final ruling.) Check Local and State Codes.

NO LEAD DESIGN

These Water Coolers are certified to be lead-free as defined by the Safe Drinking Water Act. Elkay Water Coolers are manufactured with a waterway system utilizing copper components and completely lead-free materials. These waterways have no lead because all lead materials, such as leaded brass, have been removed. All joints are brazed using silver solder only. No lead solder is permitted. A strainer with an easily cleanable screen is provided to allow trapping and convenient removal of water born particulate of 140 microns and larger prior to their entry into the water cooler.



These water coolers are classified by Underwriters Laboratories Inc. in accordance with ANSI/NSF61, Section 9-1997b.

CAPACITIES CHART

Model Number	Base Rate	**GPH of 50°F Drinking Water			Rated Watts	Full Load Amps	Glass Filler Option	Ship. WL Lbs.
		Room Temperature °F						
		70°F	80°F	90°F				
EZSTL8C	8.0	9.6	8.8	8.0	325	3.7	Yes	89
EZTL8C	8.0	9.6	8.8	8.0	325	3.7	Yes	89
EZSTLDDC	-	-	-	-	-	-	Yes	33

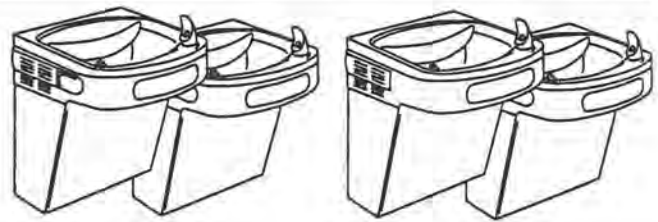
**Based on 80°F inlet water temperature. †Glass filler available at extra cost. Requires factory preparation to receive glass filler. Upper unit only.

Rated watts shown are based on operational (run) time, in accordance with A.R.I. Standard 1010 conditions. Specific applications will determine the actual watts consumed per hour. Watts consumed will be based on number of people served per hour (usage), ambient temperatures, and inlet water temperature.

COOLING SYSTEM

Motor Compressor: Hermetically sealed, reciprocating type, 115VAC, 60Hz single phase. Sealed in lifetime oil supply. Equipped with electric cord and three prong molded rubber plug (domestic models).

Condenser: Fan cooled, copper tube with aluminum fins. Fan motor is permanently lubricated.



Model EZSTL8C

Model EZTL8C

Cooling Unit: Combination tube-tank type. Tube portion is continuous coil of copper tubing. Tank is stainless steel. Fully insulated with EPS foam which meets Underwriters Laboratories Inc. requirements for self-extinguishing material.

Refrigerant Control: Refrigerant HFC-134a is controlled by accurately calibrated capillary tube for positively trouble-free operation.

Temperature Control: Enclosed adjustable thermostat is factory preset. Requires no adjustment other than for altitude requirements. Easily accessible.

CONSTRUCTION

Frame: Galvanized structural steel chassis supports refrigeration system and fastens to wall. Provides increased structural integrity and rigidity to cooler.

Stainless Steel Basin: Type 304, one piece polished to a uniform Elkay bright luster finish. Basin has integral drain grid, embossed bubbler pad. No exposed fasteners.

Flexi-Guard® Safety Bubbler*: Flexes on impact to help prevent accidental injuries. Keyed into position to prevent rotation. Anti-sweat. Meets UL requirements and all sanitary codes.

Upper Shroud: Contoured shock-absorbing, provides additional protection against accidental injury. No exposed fasteners.

Lower Shroud: One piece easy to remove and replace. Allows access to internal components from three sides.

Cabinet: Cabinet design allows for flush to wall mounting. No recess space is required.

Color Selection: Unless otherwise specified cabinet is two-tone gray upper shroud with textured gray lower shroud. Stainless Steel lower shrouds available at extra cost.

5 YEAR LIMITED WARRANTY on the refrigeration system of the unit. Electrical components and water system are warranted for 12 months from date of installation. Sample Certificate available on request.

Elkay Pressure-Type Water Coolers are designed to operate on 20 psi to 105 psi supply line pressure. If inlet pressure is above 105 psi, a pressure regulator must be installed in the supply line. Any damage caused by reason of connecting this product to supply line pressures lower than 20 psi or higher than 105 psi is not covered by the warranty.

Note: In keeping with our policy of continuing product improvement, Elkay reserves the right to change materials, design and specifications without notice.

Elkay Electric Air Cooled Water Coolers are listed by Underwriters Laboratories Inc., approved by C.S.A., rated in accordance with A.R.I. Standard 1010 and meet all known federal and state plumbing codes.



* Patent #4,481,971

Elkay Manufacturing Company

www.elkay.com

2222 Camden Court
Oak Brook, IL 60523

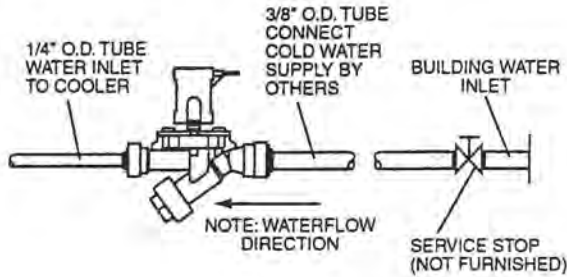
Printed in U.S.A.
©2001 Elkay Mfg. Co.

(Rev. 6/01) 12-24A

Two Station Wall Mount Water Coolers
Barrier-Free Access (Adult and Child)
ANSI/NSF61 Compliant
Models EZTL8C, EZSTL8C and EZSTLDDC



ROUGH-IN DIMENSIONS



IMPORTANT!
INSTALLER PLEASE NOTE:

This water cooler has been designed and built to provide water to the user which has not been altered by materials in the cooler waterways.

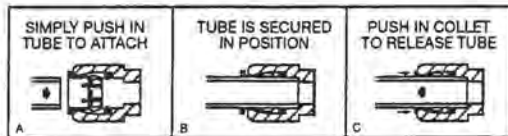
The grounding of electrical equipment such as telephone, computers, etc., to water lines is a common procedure. This grounding may be in the building but may also occur away from the building. This grounding can cause electrical feedback into a water cooler creating an electrolysis which creates a metallic taste or causes an increase in the metal content of the water. This condition is avoidable by installing the cooler using the proper materials as shown below.

NOTICE

This water cooler must be connected to the water supply using a dielectric coupling. The cooler is furnished with a non-metallic strainer which meets this requirement.

The drain trap which is provided by the installer should also be plastic to completely isolate the cooler from the building plumbing system.

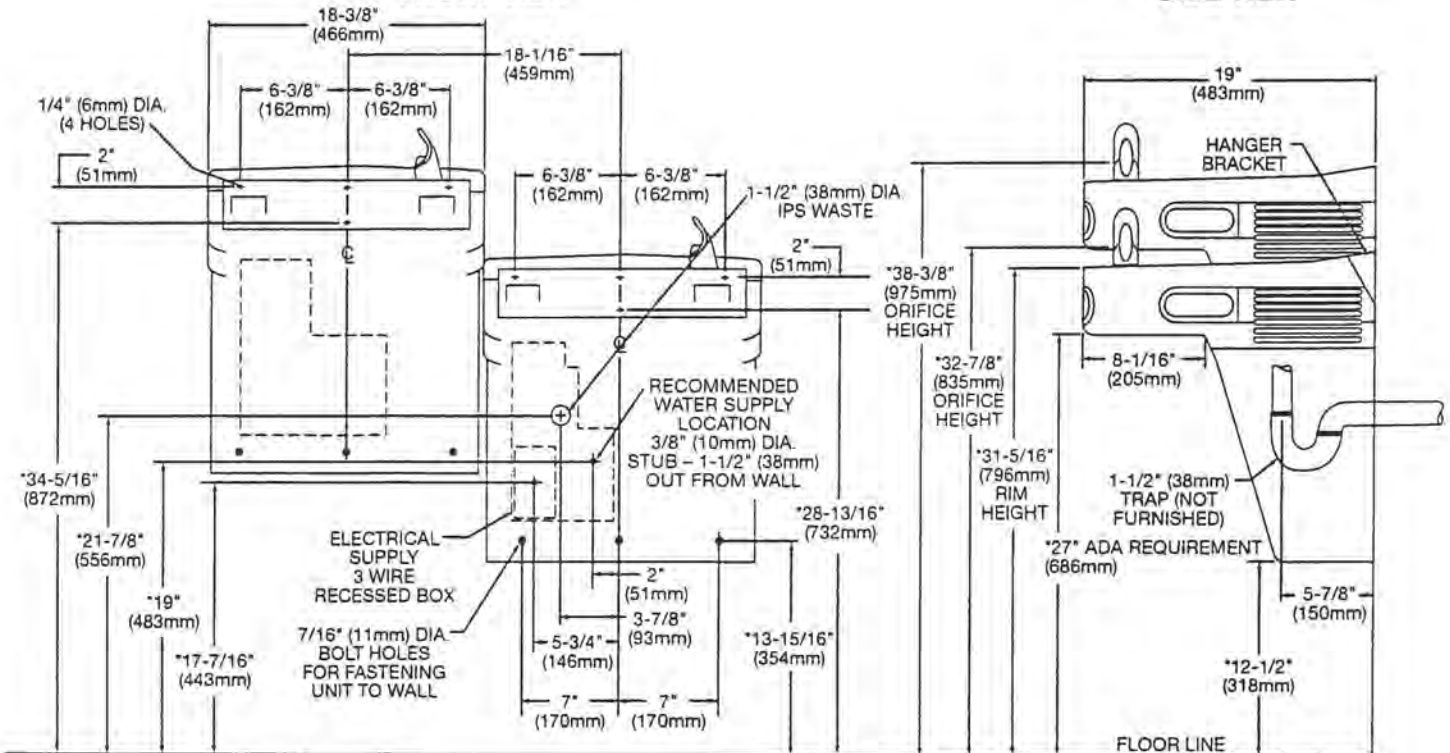
OPERATION OF QUICK CONNECT FITTINGS



PUSHING TUBE IN BEFORE PULLING IT OUT HELPS TO RELEASE TUBE

FRONT VIEW

SIDE VIEW



*Reduce height by 3 inches for installations used primarily by children ages 12 and younger. Shall also have a minimum clear floor space 30" (760mm) by 48" (1220mm).

NOTE: A service supply stop should be installed at the cooler inlet tube.

NOTE: INSURE PROPER VENTILATION BY MAINTAINING 6" (152mm) CLEARANCE FROM CABINET LOUVERS TO WALL ON EACH SIDE OF COOLER.

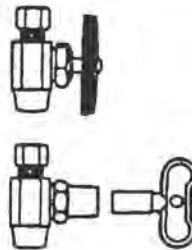
Brass Craft, Product Specifications Guide

STOP

OVAL HANDLE STYLE

Use:	Supply stop for potable water distribution systems.
Operating Pressure:	125 psi maximum
Operating Temperature:	40 - 140°F Intermittent to 180°F
Material Specifications:	<p>Body and other brass components – C36000 brass.</p> <p>Stem – C36000 brass or polymer.</p> <p>Washers – Bib and packing washers, Nitrile or EPDM rubber.</p> <p>Handle – Die cast metal or Polycarbonate plastic.</p>
Designed and Manufactured In Accordance With:	<p>ANSI A112.18.1M</p> <p>Canadian Standard CAN/CSA-B125-M93</p>
Approvals/Listings:	<p>IAPMO File #645 – Except Dual-Outlet Except valves with inlet connection to PEX pipe. Dual-Shutoff valves are IAPMO listed.</p> <p>IAPMO File #C-3678 – Valves with inlet connection to PEX pipe. CSA Approved – Except valves with inlet connection to PEX pipe.</p>

1/2" x 3/8" Chrome Angel Stop Loose Key



October 14, 1997



Commercial Product Information and Specifications

MODEL	DESCRIPTION
PF8617H	1 1/4" 17 Gauge CP P-Trap
PF8617HJ	1 1/4" X 1 1/2" 17 Gauge CP P-Trap
PF8617J	1 1/2" 17 Gauge CP P-Trap

- 17 gauge
- Chrome plated
- Deep pattern steel flange
- Solid brass, chrome plated nuts

SPECIFICATIONS

PF8617H	PF8617HJ PF867J	
A: 11"	12"	
B: 3 1/4"	3 1/4"	
C: 7 3/4"	8 3/4"	
D: 1 1/4"	1 1/2"	
E: 8"	9"	

PF8620H	1 1/4" 20 Gauge CP P-Trap
PF8620J	1 1/2" 20 Gauge CP P-Trap

- 20 gauge
- Chrome plated
- Deep pattern steel flange
- Zink die cast nuts

PF8620H	PF8620HJ	
A: 11"	12"	
B: 3 1/4"	3 1/4"	
C: 7 3/4"	8 3/4"	
D: 1 1/4"	1 1/2"	
E: 8"	9"	

PF8617COH	1 1/4" 17 Gauge CP P-Trap
PF8617COHJ	1 1/4" X 1 1/2" 17 Gauge CP P-Trap
PF8617COJ	1 1/2" 17 Gauge CP P-Trap

- 17 gauge
- Chrome plated
- Deep pattern steel flange
- Solid brass, chrome plated nuts
- With cleanout

PF8617COH	PF8617COHJ PF8617COJ	
A: 11"	12"	
B: 3 1/4"	3 1/4"	
C: 7 3/4"	8 3/4"	
D: 1 1/4"	1 1/2"	
E: 8"	9"	

TP-1 TRAP PRIMER VALVE

TP-1 TRAP PRIMER VALVE

PRECISIONP PPR500 1/2 PRIME RITE TRAP PRMR

PRECISIONP PDU3 3 OPENING DIST UNIT W/O FITTING



PRECISION PLUMBING PRODUCTS, INC.

ISO 9001 CERTIFIED COMPANY

PRIME-RITE TRAP PRIMER VALVE

"... Automatically maintains a constant water seal in from 1 to 4 floor drain traps."

Just the facts:

This innovative trap priming system automatically primes up to four floor drain traps using our patented water distribution system. The **PRIME-RITE** requires no adjustments but must be installed on a cold fresh water line of 1 1/2" diameter or less. The priming valve is automatically activated when it senses a pressure drop of 5 to 10 P.S.I.G.

Operating range: 35 to 75 P.S.I.G.

NO ADJUSTMENT REQUIRED



TRAP PRIMER VALVE SPECIFICATIONS	
	Machined of corrosion resistant brass - contains no springs or diaphragms.
	"O" ring seals tested for reliability at a temperature range of -40° to 450°F.
	Installed anywhere on the line - at least 12" above the traps to insure proper flow.
	Inlet opening 1/2" male NPT, outlet 1/2" female NPT



MADE IN USA

TRAP PRIMER DISTRIBUTION UNITS

MAX WATER DELIVERY	PRIMER MODEL	NO. OF DRAINS	SUPPLY TUBE	DISTRIBUTION UNITS
WATER DELIVERY BASED UPON PRESSURE DROP	↓ PR-500 PRIME-RITE	1	N/A	N/A
		2	N/A	DU-2
		3	N/A	DU-3
		4	N/A	DU-4

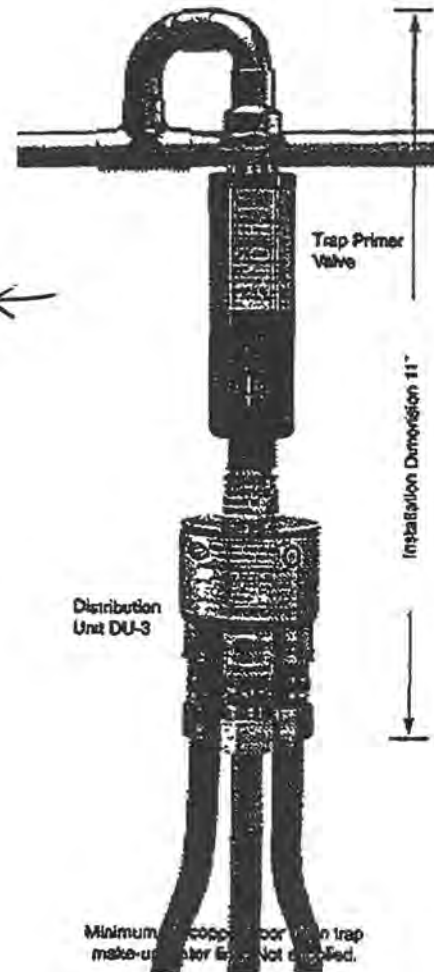
NOTE: Air gap supply (AG-500) optional.

SPECIFICATIONS: Distribution Units DU-2,3,4.

A metered amount of water from the floor drain trap primer is distributed to as many as four (4) floor drain traps by means of the patented distribution unit.

The distribution units are fully guaranteed on a money back basis when installed per manufactures recommendations.

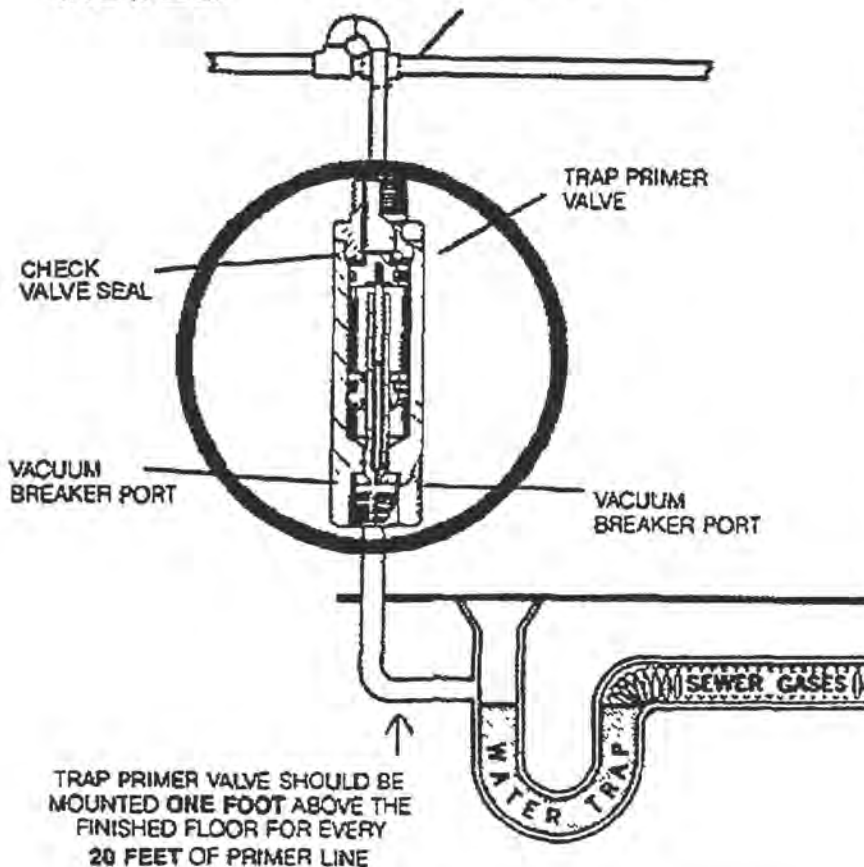
For every 20 feet of floor drain trap make-up water line the primer must be a minimum of one foot elevation from the finished floor.



TP-1 TRAP PRIMER VALVE

**EASY TO
INSTALL!**

**AVOID DIRECT INSTALLATION
TO PREVENT FOREIGN
MATERIAL FROM ENTERING
DIRECTLY INTO PRIMER.**



**DISTRIBUTION UNIT
INSTALLATION:**

- Must be installed level.
- Must be installed with clear plastic cover.
- Must be installed with access for periodic inspection.
- For further detail see information sheet specific for the distribution units.

Copyright © 2000 PPP Inc. All rights reserved
Design by 3D Access.com

TRAP PRIMER DISTRIBUTION UNITS

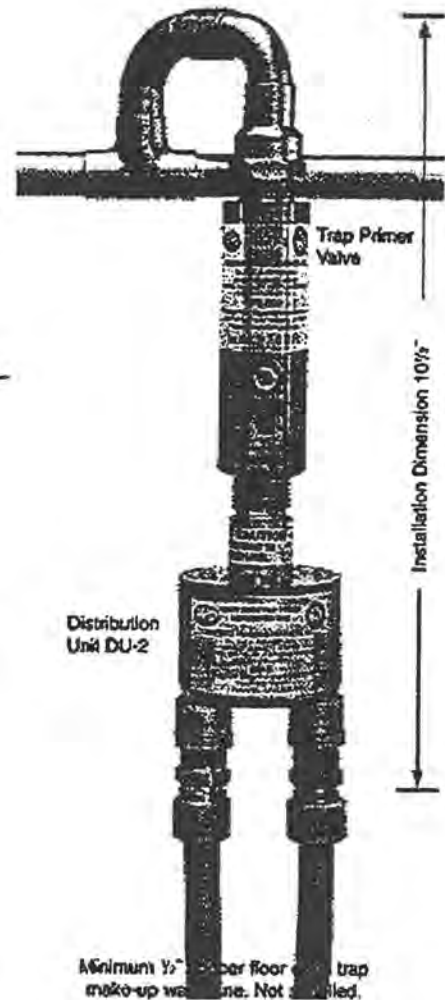
FLOOR DRAIN TRAP PRIMER DISTRIBUTION CHART

MAX WATER	PRIMER MODEL	NO. OF DRAINS	SUPPLY TUBE	DISTRIBUTION UNITS
2 oz.	P2-500	1	N/A	N/A
2 oz.	P2-500	2	N/A	DU-2
5 oz.	P1-500	3	N/A	DU-3
5 oz.	P1-500	4	N/A	DU-4
5 oz.	P1-500	5	YS-8	DU-2 & DU-3
5 oz.	P1-500	6	YS-8	DU-3 & DU-3
5 oz.	P1-500	7	YS-8	DU-3 & DU-4
5 oz.	P1-500	8	YS-8	DU-4 & DU-4

NOTE: Air gap supply (AG-500) optional.

SPECIFICATIONS: Distribution Units: DU-2,3,4.

Potable water supplied by the trap priming valve is distributed to as many as eight (8) individual floor drain traps by means of the patented distribution unit.



ET-1 EXPANSION TANK

ET-1 EXPANSION TANK

WATTS WDET5 2 GAL EXPANSION TANK FOR WTR HTR



Expansion Tanks

Series DET

Potable Water Expansion Tanks For Domestic Hot Water Systems

High quality at an affordable price, the DET Series is the solution for thermal expansion in closed systems. Absorbs the increased volume of water generated by hot water storage tanks and keeps the system pressure below the relief setting of the T&P relief valve. May be used with all types of direct-fired water heaters (gas, oil or electric) and all types of hot water storage tanks. Its pre-pressurized steel tank uses an expansion membrane to prevent air/water contact for long system life.



No.
DET-12

Features

- Thermally fused epoxy liner
- Rugged butyl diaphragm
- In-line and free-standing models
- Made in the U.S.A.

Specifications/Dimensions

	DET-5	DET-12	DET-25	DET-30
Max. Pressure (PSI)	150	150	150	100
Max. Temperature (°F)	160	160	160	160
Tank Volume (Gal.)	2	4.8	10	15
Tank Acceptance (Gal.)	1.25	3	6	6.8
Air Precharge (psi)	40	40	40	40
Connection Size (Inches)	3/4	3/4	3/4	1
Diameter (Inches)	8 3/8	11 3/8	15 3/8	15 3/8
Length (Inches)	12 1/2	14 3/4	14 1/2	24 3/4
Weight (Lbs.)	4.5	7.5	18	25

MFR Model	UPC	Description
67437		Potable water expansion tanks-Max temp 160 F-Max Press 150 PSI
67438		Potable water expansion tanks-Max temp 160 F-Max Press 150 PSI
67439		Potable water expansion tanks-Max temp 160 F-Max Press 150 PSI
67440		Potable water expansion tanks-Max temp 160 F-Max Press 100 PSI



WH-1 WALL HYDRANT

WH-1 WALL HYDRANT

WOODFORD WB65C12 12 SWT FREEZELESS WALL HYDRANT

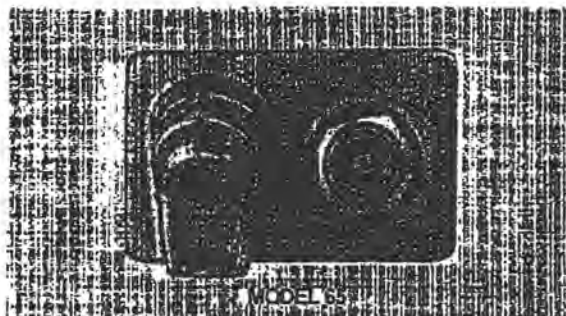
WOODFORD



B 65

**Anti-Siphon
Freezeless Wall Hydrants
Model 65/B65**

The Model 65 and B65 are automatic draining, freezeless wall hydrants with anti-siphon vacuum breakers. The Model B65 is enclosed in a flush mounted wall box. Both models are designed to blend in with modern architecture for installation on restaurants, schools, office buildings, churches, apartments, motels, stores, shopping centers and industrial buildings.



MODEL 65

Exterior Finish:
Standard - Chrome (CH)
Optional - Brass (BR) Polished Brass (PB)

SPECIFICATIONS:

MODEL 65/B65 – Approved under ASSE Standard 1019-B and listed by IAPMO®. Meets Government Specification WW-P-541b Type 205.

VACUUM BREAKER – ANTI-SIPHON - NIDEL® Model 34HA with ¼ inch male hose thread, approved under ASSE Standard 1011, Canadian Standards Association and listed by IAPMO®.

VALVE SEAT – Permanent type brass valve body with hemispherical seating surface.

VALVE – One piece valve plunger accurately controls both flow and drainage with a minimum number of turns and without need for adjustments.

DRAIN – Under nozzle away from hands of operator and with a lip to divert water away from building.

CASING – Copper tubes.

NO LEAD SOLDER - All solder joints.

STEM – Hardened stainless steel stem resists damage.

TEE KEY – Loose key operates hydrant.

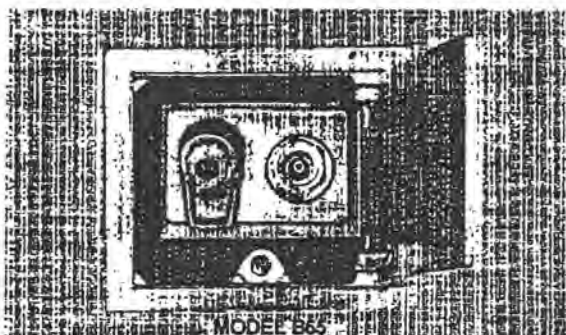
OPERATING ROD – 3/8" solid brass operating rod.

INLETS – As shown.

WALL CLAMP – Furnished on all 65 series except close coupled.

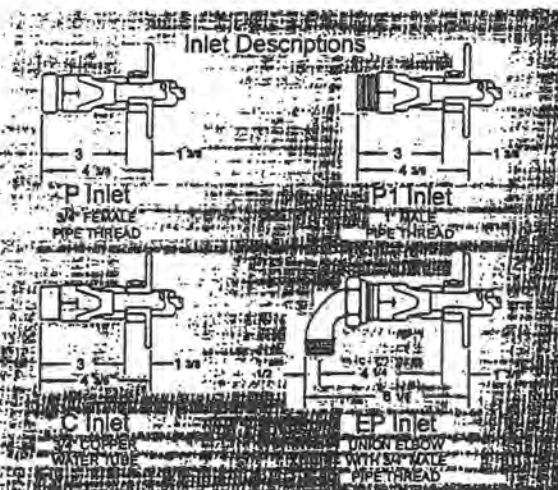
MAX PRESSURE – 125 p.s.i.

MAX TEMPERATURE - 120° F



MODEL B65

Exterior Finish: Box & Door
Standard - Chrome (CH)
Optional - Brass (BR) Polished Brass (PB)
Other Options: Anodized or Powder Coated Aluminum Box



Specify as follows:

Wall hydrant shall be Woodford Model (65-exposed type) or (B65-concealed box type), automatic draining with anti-siphon vacuum breaker. ASSE Standard 1019-B approved. ¼" inlet and outlet (specify type of inlet). Hardened stainless steel operating stem and one-piece valve plunger to control both flow and drain functions. Exterior finish to be Chrome Plated (options: Polished Brass or Rough Brass). Loose tee key to be furnished with each hydrant. Wall thickness to be _____ inches.

When ordering, specify model number, inlet, and wall thickness.

©1999 WOODFORD Mfg.

Rev. 06/99 Form No. 65.102

VALVES - freezeless

15p



09 76

WOODFORD MFG. CO.

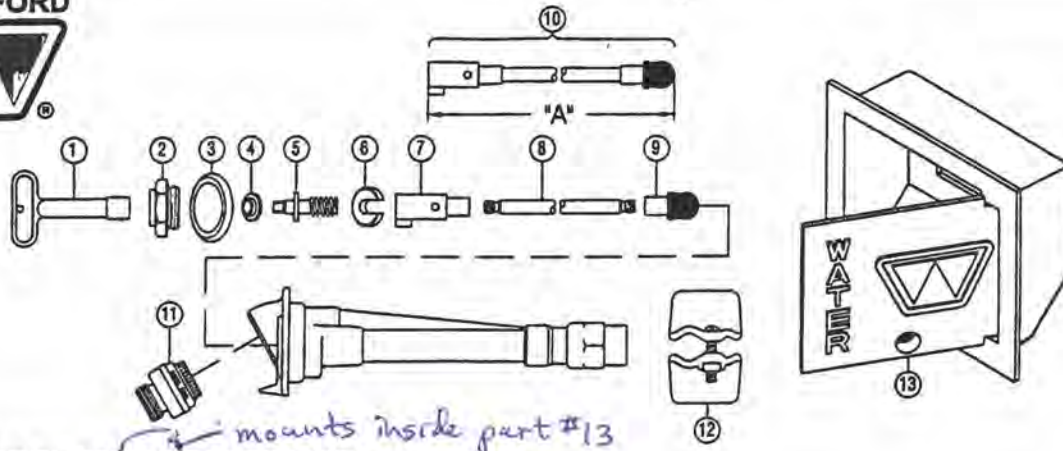
WOODFORD MFG. CO.

09 76



15p

VALVES



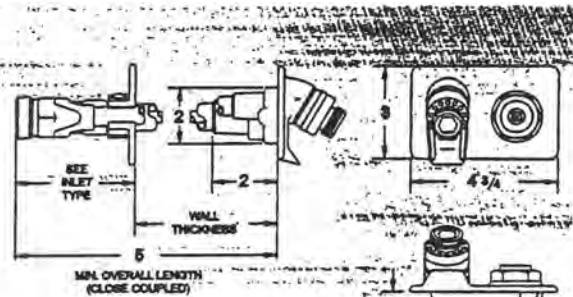
MODEL 65(B65) PARTS LIST

- | ITEM | PART # | DESCRIPTION |
|------|--------|--|
| 1 | 50009 | Tee Key |
| | 50010 | Long Tee Key (Box Models) |
| 2 | 50264 | Head Nut - chrome |
| | 50265 | Head Nut - brass |
| 3 | 50583 | I.D. RING |
| 4 | 50252 | Stem Washer |
| 5 | 55062 | Stem Screw |
| 6 | 50251 | "C" washer |
| 7 | 51014 | Yoke Nut |
| 8 | | Operating Rod (Sold With Item 10 Only) |
| 9 | 50250 | Plunger |
| 10 | 554XX | Operating Rod Assembly (Includes Items 7,8,9)
(Select required assembled length from table below) |
| 11 | 55058 | Vacuum Breaker - chrome |
| | 55057 | Vacuum Breaker - brass |
| 12 | 55063 | Wall Clamp Assembly |
| 13 | 55070 | Box/Door Assembly - brass |
| | 55071 | Box/Door Assembly - polished brass |
| | 55072 | Box/Door Assembly - chrome |
| | 55431 | Box/Door Assembly - Anodized Aluminum |
| | 55432 | Box/Door Assembly - Powder Coated Aluminum |

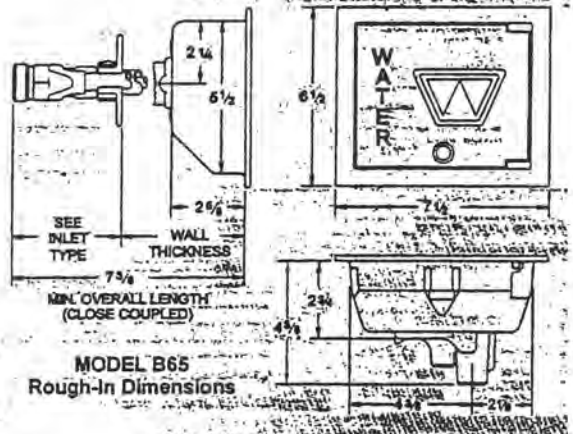
RK-65 Chrome Repair Kit (Includes Items 1-7 & 9)

Operating Rod Assy. "A"			
Wall Thickness		Length	Part No.
65	B65		
CC	CC	3 1/2"	55401
N/A	4	4 1/2"	55402
4	6	6 1/2"	55404
6	8	8 1/2"	55406
8	10	10 1/2"	55408
10	12	12 1/2"	55410
12	14	14 1/2"	55412
14	16	16 1/2"	55414
16	18	18 1/2"	55416
18	20	20 1/2"	55418
20	22	22 1/2"	55420
22	24	24 1/2"	55422
24	N/A	26 1/2"	55424

Manufactured under one or more of the following patents:
 U.S. Patents:
 3,414,001
 4,178,956
 4,316,481
 4,532,954
 D216,790
 D216,791
 D277,365
 D277,366
 Canada Patents:
 852,529
 865,995
 1,146,438



MODEL 65
Rough-In Dimensions



MODEL B65
Rough-In Dimensions

Wall Thickness (in)	CC	4	6	8	10	12	14	16	18	20	22	24
Overall Length*	5	8	10	12	14	16	18	20	22	24	26	28
Shipping Wt. (Lbs)**	3.8	4.4	4.8	5.2	5.6	6	6.4	6.8	7.2	7.6	8	8.4

** Add 7.4 Lbs for brass box models.
 ** Add 2.5 Lbs for Aluminum box models.
 *Add 3/8" for all box hydrants
 except CC units add 2 3/8".

NOTE: Close Coupled Models are not recommended for use in freezing climates and cannot use wall clamp

For more information write to...

WOODFORD MANUFACTURING COMPANY

2121 Waynoka Road, Colorado Springs, Colorado 80915 • Phone: (719) 574-1101 • Fax: (719) 574-7621
 To view our complete product line visit: www.woodfordmfg.com



FD-1 FLOOR DRAIN

FD-1 FLOOR DRAIN

ZURN ZZ4157B4NH-P ZURN 4" FLR DRN NB TOP



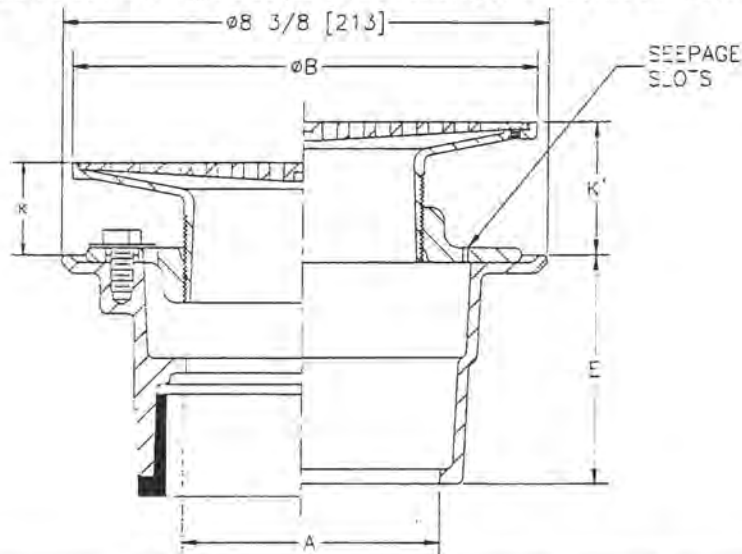
Z-415

BODY ASSEMBLY WITH "TYPE B" STRAINER

SPECIFICATION SHEET

TAG FD-1

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



Dimensions In Inches						Approx. Wt. Lbs. [kg]	Strainer Open Area Sq. In. [cm ²]
A - Pipe Size	B Strainer Dia.	K		K'			
		Min.	Max.	Min.	Max.		
2-3 [50-75]	5 [127]	1/2 [13]	1 5/8 [41]	1 3/8 [35]	2 3/8 [60]	11 [5]	8 [52]
2-3-4 [50-75-100]	6 [152]	3/4 [19]	1 3/4 [44]	1 5/8 [41]	2 3/4 [70]	13 [6]	9 [58]
→ 2-3-4 [50-75-100]	7 [178]	1 [25]	2 1/4 [57]	2 [51]	3 1/8 [79]	14 [6]	12 [77]
3-4 [75-100]	8 [203]	1 1/8 [29]	2 1/4 [57]	2 [51]	3 1/8 [79]	16 [7]	18 [116]
6 [150]	8 [203]	1 1/8 [29]	2 1/4 [57]	2 [51]	3 1/8 [79]	18 [8]	18 [116]
6 [150]	10 [254]	1 5/8 [41]	2 5/8 [67]	2 5/8 [67]	3 1/2 [89]	22 [10]	26 [168]

ENGINEERING SPECIFICATION: ZURN ZN-415 Floor and shower drain, Dura-Coated cast iron body with bottom outlet, combination invertible membrane clamp and adjustable collar with seepage slots and "TYPE B" polished nickel bronze strainer.

OPTIONS (Check/specify appropriate options)

PIPE SIZE

(Specify size/type) **OUTLET**

'E' BODY HT. DIM.

2 thru 4 [50 thru 100]	— IC Inside Caulk	3 7/8 [98]
2 thru 4 [50 thru 100]	— IG Inside Gasket	3 7/8 [98]
2 [50]	— IP Threaded	2 3/8 [60]
3 [75]	— IP Threaded	2 5/8 [67]
4 [100]	— IP Threaded	2 7/8 [73]
6 [150]	— IP Threaded	2 3/4 [70]
2 thru 4 [50 thru 100]	<input checked="" type="checkbox"/> NH No-Hub	3 7/8 [98]
2 thru 4 [50 thru 100]	— NL Neo-Loc	4 5/8 [117]

PREFIXES

<input type="checkbox"/>	ZB-	D.C.C.I. Body Assembly w/Polished Bronze Top
<input checked="" type="checkbox"/>	ZN-	D.C.C.I. Body Assembly w/Polished Nickel Bronze Top*
<input type="checkbox"/>	ZS-	D.C.C.I. Body Assembly w/6 [152] Dia. Stainless Steel Top

SUFFIXES

—	-AA	All Acid Resisting Epoxy	—	-VP	Vandal Proof Secured Top
—	-AR	Acid Resisting Epoxy Coated Cast Iron	—	-W	Winter Closure Plug
—	-DP	Decorative Polished Top	—	-Y	Sediment Bucket
—	-G	Galvanized Cast Iron	—	-4	4 [100] Diameter funnel
—	-HD	Heavy Duty Slotted Grate (ZN 5 [127] and 6 [150] sizes only)	—	-90	90° Threaded Side Outlet Body (2 [50], 3 [75] Only)
<input checked="" type="checkbox"/>	-P	Trap Primer Connection (Specify 1/2 [13] or 3/4 [19])			
—	-U	1 [25]-3 [76] High Extension Adapter			
—	-V	Backwater Valve			

*REGULARLY FURNISHED UNLESS OTHERWISE SPECIFIED

REV. D DATE: 05/22/02 C.N. NO. 89042

DWG. NO. 58789 PRODUCT NO. Z-415-B

ZURN INDUSTRIES, INC. • SPECIFICATION DRAINAGE OPERATION • 1801 Pittsburgh Ave. • Erie, PA 16514

Phone: 814/455-0921 • Fax: 814/454-7929 • World Wide Web: www.zurn.com

In Canada: ZURN INDUSTRIES LIMITED • 3544 Nashua Drive • Mississauga, Ontario L4V1L2 • Phone: 905/405-8272 Fax: 905/405-1292

FCO FLOOR CLEANOUT

FCO FLOOR CLEANOUT

ZURN ZZN1400NH ZURN CI ADJ CO W/ NB TOP

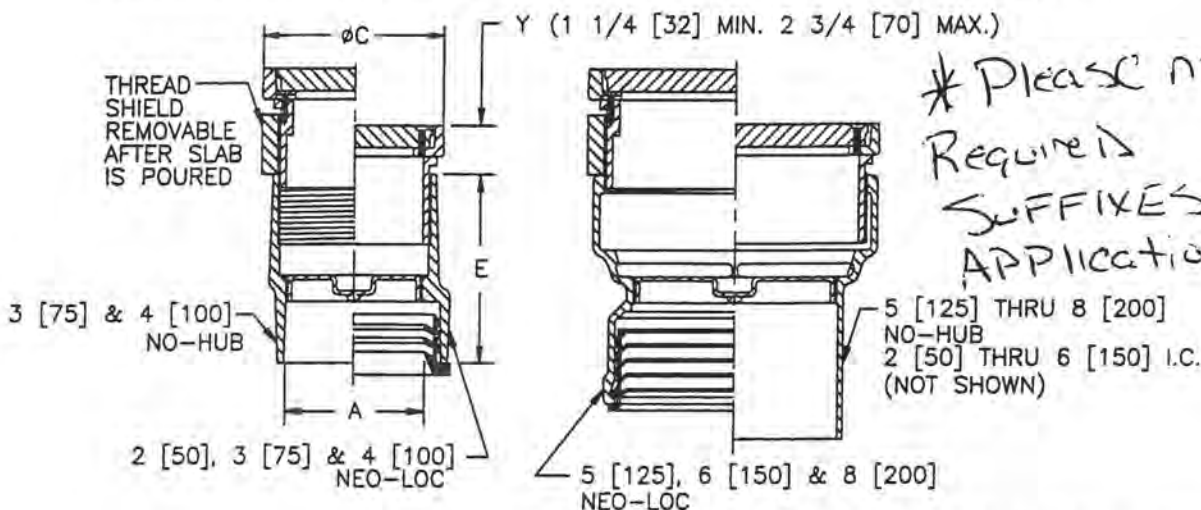


Z1400 ADJUSTABLE CLEANOUT

SPECIFICATION SHEET

TAG FCZ

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



** Please note
Required
SUFFIXES FOR
APPLICATION*

ENGINEERING SPECIFICATION: ZURN Z-1400 "Level-Trol" Adjustable floor cleanout, Dura-Coated cast iron body, with gas and watertight ABS tapered thread plug, and round scoriated secured heavy duty top, adjustable to finished floor.

Dimensions in Inches			Approx. Wt. Lbs. [kg]
A-Pipe Size	C	E	
Inside Caulk			
2 [50]	6 1/8 [156]	6 7/8 [175]	6 [3]
3 [75]	6 1/8 [156]	6 7/8 [175]	8 [4]
4 [100]	7 1/4 [184]	6 7/8 [175]	9 [4]
5 [125]	8 1/4 [210]	6 7/8 [175]	12 [5]
6 [150]	9 1/4 [235]	6 7/8 [175]	15 [7]
No-Hub			
3 [75]	4 1/8 [105]	5 3/8 [137]	8 [4]
4 [100]	5 1/8 [130]	5 3/8 [137]	9 [4]
5 [125]	7 1/4 [184]	7 1/2 [191]	12 [5]
6 [150]	8 1/4 [210]	7 1/2 [191]	15 [7]
8 [200]	9 1/4 [235]	7 1/2 [191]	21 [10]
Neo-Loc			
2 [50]	4 1/8 [105]	5 3/8 [137]	6 [3]
3 [75]	5 1/8 [130]	5 3/8 [137]	8 [4]
4 [100]	5 1/8 [130]	5 3/8 [137]	9 [4]
5 [125]	7 1/4 [184]	6 1/2 [165]	12 [5]
6 [150]	8 1/4 [210]	6 1/2 [165]	15 [7]
8 [200]	9 1/4 [235]	6 1/2 [165]	21 [10]

OPTIONS (Check/specify appropriate options)

PREFIXES

- Z Dura Coated Cast Iron*
- ZB D.C.C.I. with Polished Bronze Top (Deduct 1/2[13] from 'Y' Dim)
- ZN D.C.C.I. with Polished Nickel Bronze Top (Deduct 1/2[13] from 'Y' Dim)
- ZS D.C.C.I. with Polished Stainless Steel Top

SUFFIXES

- AR Acid Resisting Epoxy Coated Finish
- BP Bronze Plug
- CF Carpet Flange Cover (ZB, ZN only)
- CM Carpet Marker
- DC Duresist Cover
- DX Round ZB or ZN Top With Dex-o-tex Flange (2 thru 4 [50 thru 100] only)
- G Galvanized Cast Iron
- HD Heavy Duty Top (Add 1/8 [3] to 'Y' Dim. ZB and ZN only)
- K Anchor Flange
- KC Anchor Flange With Clamp Collar
- SG Solid Gasketed Cover
- SM Special Marking Stamped on Cover
- T Square Top
- TX Square Top Recessed for 1/8[3] Tile (ZB and ZN only)
- VP Vandal Proof Screws
- X Round Top Recessed for 1/8[3] Tile (ZB or ZN only)
- Z Round Top Recessed for 1 1/4[32] Terrazzo (ZB or ZN only)

PIPE SIZE

- 2 thru 6 [50 thru 150]
- 3 thru 6, 8 [75 thru 150, 200]
- 2 thru 6, 8 [50 thru 150, 200]

(Specify size/type) **OUTLET**

- IC Inside Caulk
- NH No-Hub
- NL Neo-Loc

'E' BODY HT. DIM.

- See Chart
- See Chart
- See Chart

*REGULARLY FURNISHED UNLESS OTHERWISE SPECIFIED

REV. H	DATE: 1/24/03	C.N. NO. 90197
DWG. NO. 58757		PRODUCT NO. Z1400

1
EWH-1 ELECTRIC WATER HEATER

EWH-1 ELECTRIC WATER HEATER

AOSMITH ADEL15S12015 15 GAL ELEC ~~1.5~~ KW 120V WTR HTR

2 KW

A.O. SMITH

Designed for use as a recovery heater having its own storage tank. Available in upright standard models (DEN) and lowboy models (DEL).

FEATURES

GLASS-LINED TANK - Thirteen sizes; 6 thru 119 gallon capacity. Tank interior is coated with glass specially developed by A. O. Smith Ceramic Research for water heater use. Tanks rated 150 psi working pressure; tested at 300 psi. Foam insulation provides maximum energy savings by minimizing radiant standby heat loss.

ELEMENTS - Zinc plated copper sheaths for longer life. Medium watt density; means lower surface temperature to minimize scale build-up and more surface to heat water. Element sizes from 1.5 to 6 KW. Maximum input 12 KW (see chart on back).

STANDARD VOLTAGES - 120, 277 single phase and 208, 240 and 480V unbalanced three-phase delta; easily converted to single-phase at terminal block (except 208V with 6000 watt elements). Single element heater, single-phase only.

TERMINAL BLOCK - Factory installed. Just bring the service to heater and connect to block. Terminal block not supplied on 120V & 277 volt models.

CONTROLS - Temperature control (adjustable through a range of 110° to 170°F) and manual reset high temperature cutoff per element (dual element models). Factory wired for non-simultaneous operation; easily converted to simultaneous element operation (three phase models only).

OPTIONAL

GOLDENROD ELEMENTS - All DEN & DEL models are available with the Goldenrod 24K gold plated elements (patent pending). Goldenrod elements provide long life and 6 times the scaling resistance of standard incoloy elements. Goldenrod elements carry a three-year warranty against failure due to lime scale build-up.

ELEMENT AVAILABILITY CHART

Input	120V	208V	240V	277V	480V
1,500	YES	YES	YES	YES	—
2,000	YES	YES	YES	YES	YES
2,500	YES	YES	YES	YES	YES
3,000	YES	YES	YES	YES	YES
3,500	—	—	YES	—	—
4,000	—	YES	YES	YES	YES
4,500	—	YES	YES	YES	YES
5,000	—	YES*	YES*	YES*	YES*
5,500	—	—	YES*	—	—
6,000	—	YES**	YES	YES	YES

NOTE: DEL-6 not available in above 2.5 KW.

DEL-6 not available in 480V.

* Not available in DEL-10, DEL-15 and DEN-30.

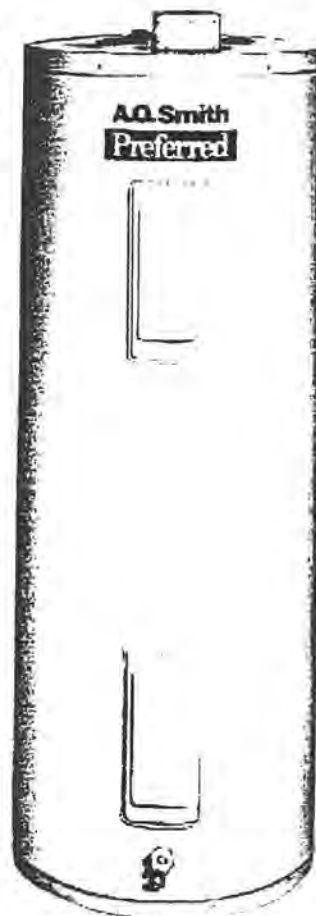
** A6 non-simultaneous circuit only.

Dura-Power

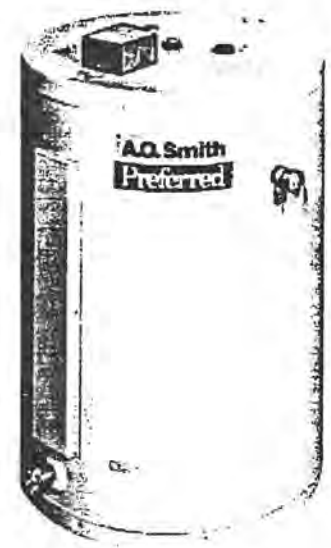
COMMERCIAL ELECTRIC WATER HEATERS
DEN & DEL MODELS

Meets or exceeds the requirements of ASHRAE 90.1b-1992 Standard for energy efficiencies.

See page C 029.0 for service wiring and fuse selection.



DEN MODELS



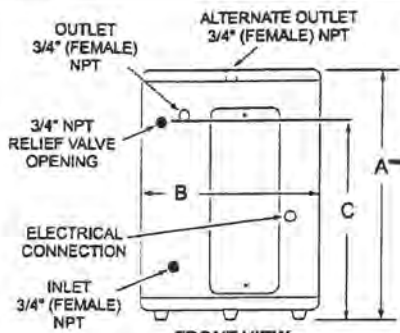
DEL MODELS

LIMITED WARRANTY OUTLINE

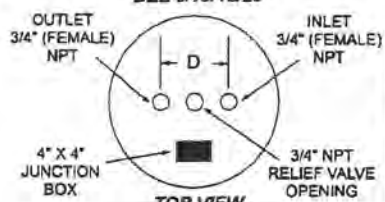
If the tank should leak any time during the first three years, under the terms of the warranty, A. O. Smith will furnish a replacement heater; installation, labor, handling and local delivery extra. **THIS OUTLINE IS NOT A WARRANTY.** For complete information, consult the written warranty or A. O. Smith Water Products Company.

OTHER STANDARD FEATURES

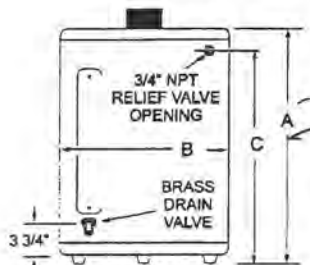
- Simplified circuitry, color coded for ease of service
- Anode rod for maximum corrosion protection
- Cabinet has bonderized undercoat with baked enamel finish
- Top inlet and outlet openings
- Drain valve
- UL approved field conversion program.



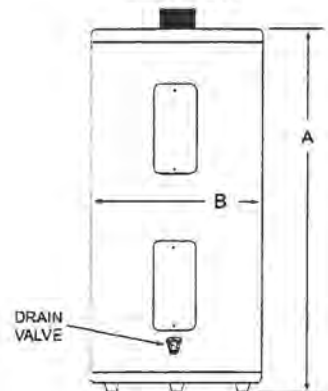
FRONT VIEW
DEL 6/10/15/20



TOP VIEW
DEN/DEL 30/40/50



FRONT VIEW
DEL 30/40/50



FRONT VIEW
DEN

ALL DIMENSIONS IN INCHES

Models	Tank Capacity Gallons	A	B	C	D	Approx. Ship Wt. (Lbs.)
*DEL-6	6	15 1/2	14 1/4	11	----	35
DEL-10	10	18 1/4	18	12 1/2	----	54
*DEL-15	15	26	18	20 1/2	----	58
*DEL-20	20	22 1/4	21 3/4	15 3/8	----	73
**DEN-30	30	34 1/2	20 1/4	----	8	98
**DEL-30	30	30 7/8	21 3/4	24 1/8	8	100
**DEN-40	40	45 1/8	20 1/2	----	8	113
**DEL-40	40	32 1/4	23 1/4	25 9/16	8	125
**DEN-52	50	54 7/8	20 1/2	----	8	131
**DEL-50	50	32 1/4	25 1/4	25 1/8	8	166
**DEN-66	66	60 3/4	21 3/4	----	8	176
**DEN-80	80	59 3/8	24	----	8	211
**DEN-120	119	62 7/16	29 3/8	----	8	326

* Single element - **Dual elements

ELECTRIC CHARACTERISTICS AND CAPACITIES

Element Wattage Upper/Lower	NON-SIMULTANEOUS AND SINGLE ELEMENT OPERATION						Full Load Current in Amperes Connected to Single Phase Power (All Terminals - L1,L2,&L3)		
	Recovery Capacities GPH @ Temperature Rise Of								
	40°	60°	80°	100°	120°	208V	240V	480V	
1500	15	10	8	6	5	7.2	6.3	3.2	
2000	21	14	10	8	7	9.6	8.3	4.2	
2500	26	18	13	10	9	12.0	10.4	5.2	
3000/3000	31	20	15	12	10	14.4	12.5	6.3	
4000/4000	41	27	20	16	14	19.2	16.7	8.3	
4500/4500	46	31	23	18	15	21.6	18.8	9.4	
5000/5000	51	34	26	20	17	24.0	20.8	10.4	
6000/6000	61	41	31	25	20	28.8	25.0	12.5	

Element Wattage Upper/Lower	SIMULTANEOUS DUAL ELEMENT OPERATION (both elements on when entire tank is cold)						Full Load Current in Amperes Connected to Three Phase Power (Terminal L2/Terminals L1 & L3)		
	Recovery Capacities GPH @ Temperature Rise Of								
	40°	60°	80°	100°	120°	208V	240V	480V	
3000/3000	61	41	31	24	20	25.0/14.4	21.7/12.5	10.8/6.3	
4000/4000	81	54	41	33	27	33.3/19.2	28.9/16.7	14.4/8.3	
4500/4500	91	61	45	37	31	37.5/21.6	32.5/18.8	16.2/9.4	
5000/5000	102	68	51	41	34	41.6/24.0	36.1/20.8	18.0/10.4	
6000/6000	122	81	61	49	41	N/A	43.3/25.0	21.7/12.5	

Recovery capacities at 100°F rise equal: for non-simultaneous element operation - 4.1 gal. x KW of one element; for simultaneous element operation - 4.1 gal. x 2/3 KW of both elements. For other rises multiply element KW as previously explained by 410 and divide by temperature rise. Full load current for single phase = total watts ÷ voltage.

SUGGESTED SPECIFICATIONS

The water heater(s) shall be Dura-Power Model(s) No. DEL 15 as manufactured by A. O. SMITH or an approved equal. Heater(s) shall be rated at 2 KW, _____ volts, 120 phase, 60 cycle AC, and listed by Underwriters' Laboratories. Tank(s) shall be 15 gallon capacity. Heater(s) shall have 150 psi working pressure and be equipped with extruded high density anode rod. All internal surfaces of the heater(s) exposed to water shall be glass-lined with an alkaline borosilicate composition that has been fused to steel by firing at a temperature range of 1600°F. Electric heating elements shall be medium watt density with zinc plated copper sheath. Each element shall be controlled by an individually mounted thermostat and high temperature cutoff switch. The outer jacket shall be of baked enamel finish and shall be provided with full size control compartment for performance of service and maintenance through hinged front panels and shall enclose the tank with foam insulation. Electrical junction box with heavy duty terminal block shall be provided (except on 120V & 277V [no junction box on DEL-6 thru 20]). The drain valve shall be located in the front for ease of servicing. Heater tank shall have a three year limited warranty as outlined in the written warranty. Fully illustrated instruction manual to be included.

A.O. Smith Water Products Co., Inc. On Line
www.hotwater.com

For Technical Information and
Automated Fax Service,
Phone: 800-527-1953

A. O. Smith
Water Products Company
Ashland City, TN
A Division of A. O. Smith Corporation

A. O. Smith Corporation reserves the right to make product changes
or improvements at any time without notice.

GWH-1 GAS WATER HEATER

GWH-1 GAS WATER HEATER

A O SMITH ABTH120 AOSMITH BTH-120

A.O. SMITH

Energy Saving Product

Exceeds the minimum requirements of ASHRAE/IES 90.1b-1992 for thermal efficiency and standby loss.

Model BTH 120 970

FEATURES

Serial No. MH03-2661771-970

94% THERMAL EFFICIENCY - Fully condensing design is 16% more efficient than the ASHRAE requirement of 80%.

FLEXIBLE VENTING - 3" or 4" PVC, ABS or CPVC pipe is recommended. The CYCLONE XHE™ vents vertically, horizontally and is also approved for direct vent sealed combustion applications. 50 equivalent feet maximum using 3" vent, 120 equivalent feet using 4" vent.

ADVANCED ELECTRONIC CONTROLS - A microprocessor controls the ignition and thermostat allowing precise setting of water temperatures from 110°F to 180°F. A digital display panel shows the operating mode, all user settings and any failure modes for ease of service.

PRESET POWER BURNER - Developed for the CYCLONE XHE™, a turbulent jet flame shoots down the submerged combustion chamber in a spiral action. This turbulence causes a thorough mixing of the gas and air for optimum combustion and high heat transfer efficiencies.

SUBMERGED COMBUSTION CHAMBER - Submerging the combustion chamber in the center of the water storage tank minimizes radiant heat loss and improves efficiency.

ZERO INCH CLEARANCE - The CYCLONE XHE™ jacket is cool and is approved for zero inches to combustibles for unsurpassed installation flexibility.

SPIRAL WOUND FLUE TUBE - The continuous spiral flue tube keeps the hot combustion gases moving at a high velocity. The combination of high turbulence and velocity causes an enormous rate of heat transfer into the water.

SCALE FREE - This flue design prevents scale and sediment from forming on the flue tube and reducing efficiency over time.

GLASS LINED TANK - Proprietary ceramic coating developed by A.O. Smith's ceramic engineers specifically for this heater is applied after the complete tank has been assembled to give a seamless barrier against corrosion by hot water. The maximum working pressure is 160 psi.

HANDHOLE CLEANOUT - Allows easy inspection and cleaning of the tank.

FOAM INSULATION - Thick foam insulation protected by a heavy gauge steel jacket contributes to low standby losses.

EASY INSTALLATION - All components are factory assembled and 100% tested prior to shipment. Only gas, water, electrical and venting connections need to be made. No major field adjustments are required for proper operation. Includes T&P valve and drain valve.

CYCLONE^{XHE™}

94% EXTRA HIGH EFFICIENCY
TANK-TYPE WATER HEATERS
BTH-120, BTH-150, BTH-199 & BTH-250



Mfg
08/20/03
Installed
04/16/2004

SCAQMD Approved, Rule 1146.2 Low NOx for California and Texas.



LIMITED WARRANTY OUTLINE

If the tank assembly which includes the combustion chamber and flue should leak any time during the first three years, under the terms of the warranty, A.O. Smith will furnish a replacement tank assembly. Installation, labor, handling and local delivery are extra. **THIS OUTLINE IS NOT A WARRANTY.** For complete information, consult the written warranty or A.O. Smith Water Products Company.

Warranty does not apply to product installed outside of the United States of America or its territorial possessions and Canada.

PATENTS PENDING

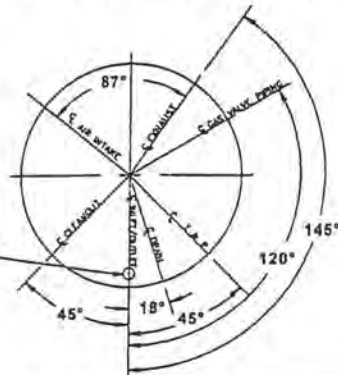
ROUGH IN DIMENSIONS

INSTALLATION CLEARANCES

Sides	0"
Front	4"
Rear	0"
Top	2"

Combustible clearances 0".
Approved for combustible floors.

(OPTIONAL)
WATER OUTLET
IN TOP OF UNIT

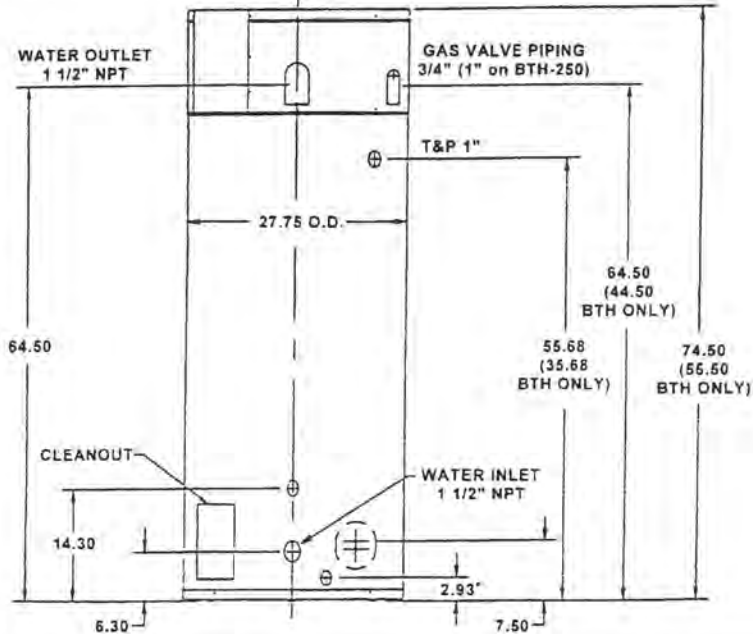


AIR INTAKE 3" PVC, CPVC, ABS, 50' EQUIVALENT MAXIMUM.

FLUE EXHAUST 3" PVC, CPVC, ABS, 50' EQUIVALENT MAXIMUM.

AIR INTAKE 4" PVC, CPVC, ABS, 120' EQUIVALENT MAXIMUM.

FLUE EXHAUST 4" PVC, CPVC, ABS, 120' EQUIVALENT MAXIMUM.

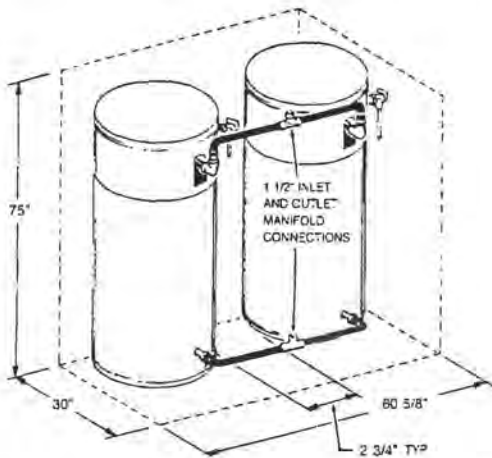


RECOVERY CAPACITIES

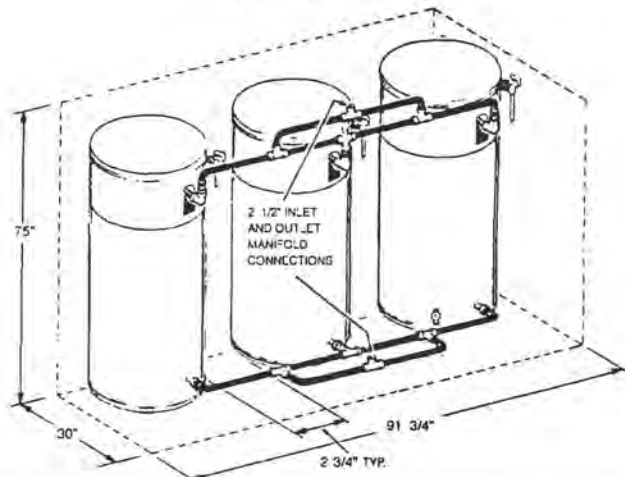
Model	BTU Input	Approx. Gallon Capacity	Ship. Wt.	Temperature Rise - Degrees F - Gallons per Hour													
				30	40	50	60	70	80	90	100	110	120	130	140		
BTH-120	125,000	60	350	475	356	285	237	203	178	158	142	129	119	110	102		
BTH-150	150,000	100	438	570	427	342	285	244	214	190	171	155	142	131	122		
BTH-199	199,000	100	438	756	567	453	378	324	283	252	227	206	189	174	162		
BTH-250	240,000*	100	438	912	684	547	456	391	342	304	273	249	228	210	195		

*BTH-250 NOT AVAILABLE IN LP GAS.

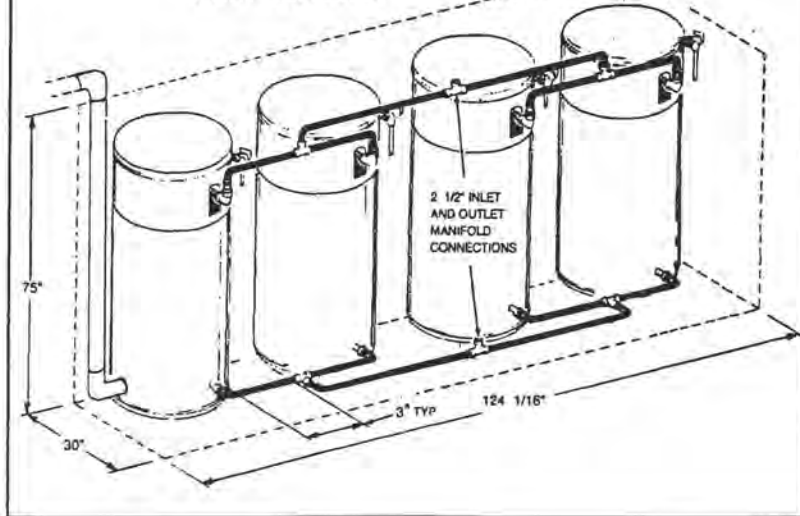
TWO UNIT MANIFOLD KIT (PART NO. 78692)



THREE UNIT MANIFOLD KIT (PART NO. 78693)



**FOUR UNIT MANIFOLD KIT
(PART NO. 78694)**



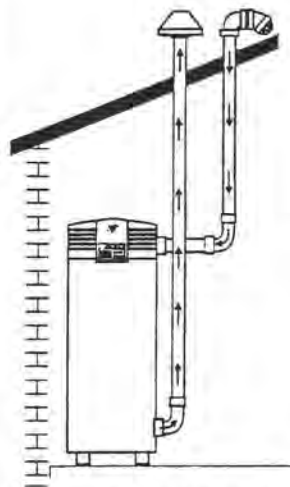
1. Direct Vent/Sealed Combustion

The ultimate venting system for either horizontal or vertical applications.

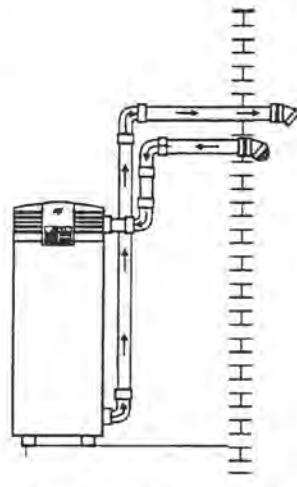
This system gives the specifier and installer optimum venting flexibility in placing the Cyclone XHE at point of use. The safe, two-vent, system allows clean uncontaminated air to be drawn directly into the unit. The flue gas products are expelled directly through the wall to the outside. This two-vent system protects the unit from harmful flue products being recirculated.

2. Sidewall or Vertical

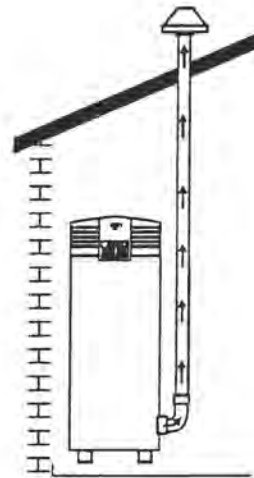
The Cyclone XHE series can be vented directly through an outside wall or vertically up through the roof. Quick and simple. Perfect for retrofit and cost saving installations.



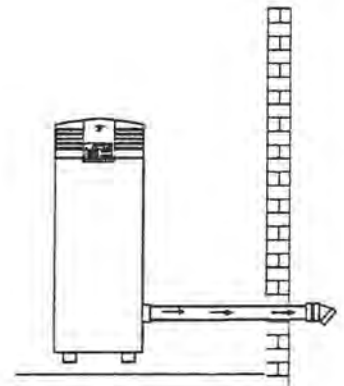
**SEALED DIRECT VENT
VERTICAL**
50' INTAKE, 50' EXHAUST



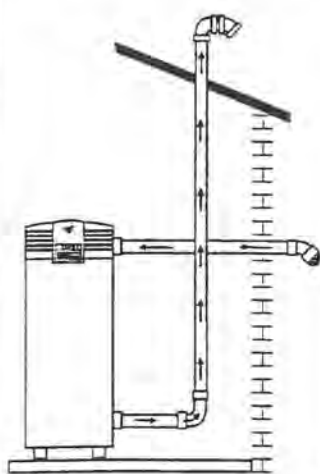
**SEALED DIRECT VENT
SIDEWALL**
50' INTAKE, 50' EXHAUST



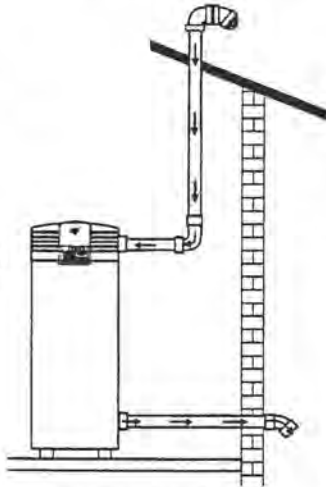
**INDOOR CONVENTIONAL
VERTICAL**
50' EXHAUST



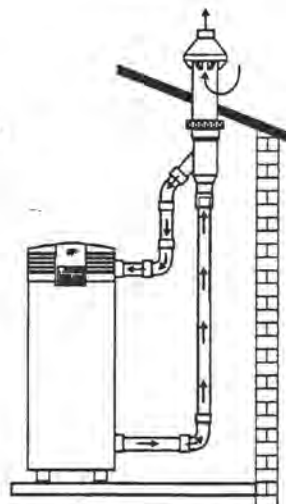
**INDOOR CONVENTIONAL
SIDEWALL**
50' EXHAUST



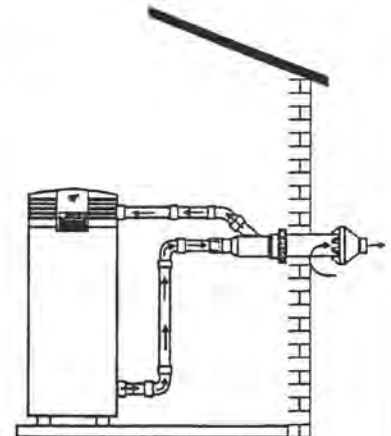
**SEALED DIRECT VENT
HORIZONTAL INTAKE
VERTICAL EXHAUST**



**SEALED DIRECT VENT
VERTICAL INTAKE
HORIZONTAL EXHAUST**



**SEALED DIRECT VENT
w/CONCENTRIC VENT
VERTICAL TERMINATION**



**SEALED DIRECT VENT
w/CONCENTRIC VENT
HORIZONTAL TERMINATION**

SPECIAL CONSTRUCTION FEATURES

All functional controls are located at the top of the heater for ease of service and protection from water damage in equipment rooms that have potential for flooding. The top cover comes off quickly to provide convenient access for all serviceable parts.

This is a fully condensing water heater. The latent heat energy which holds water in the vapor state in the combustion process is effectively scavenged. This means that water which would normally escape up the flue as vapor in a conventional heater is condensed into its liquid state prior to exiting the heater. The spiral flue tube coils downward to permit natural drainage of the condensate. As a result the flue exits at the bottom of the heater. The heater should be located near a drain to enable the condensate to be properly disposed of.

The exhaust gases of this heater are less than 140 degrees F, much lower than a standard water heater. In cold climates any water vapor remaining in the flue gases will condense into a cloud of vapor at the point where the vent system exits the building. This vapor can discolor exterior building surfaces over a period of time. The flue exhaust should be located in an area where the water vapor cloud or potential discoloration of the walls is not a concern. Locating the vent termination out from the wall by six or more inches helps prevent the vapor from being trapped in the layer of air that sometimes forms along a buildings face. The vent can also be terminated on the roof to avoid any problems. Always keep the vent above the maximum snow line so it cannot get covered up. Do not locate the exhaust above a walkway.

Avoid locating the air intake too close to the exhaust of this unit or any other exhaust terminations that discharge moisture laden air such as clothes dryers, in very cold climates. The intake can freeze over if the moisture is drawn through the screen required to prevent foreign objects from getting sucked into the fan. A separation of three feet is usually adequate to prevent intake freezing. Locate the intake above the maximum snow line also. The heater is equipped with sensors to shut it down if any blockage of the vent or intake occurs. A light on the diagnostic panel will alert the maintenance people to the problem.

Avoid locating the exhaust terminals close to bedroom windows or areas where blower noise will be objectionable. Venting into corners or confined areas will amplify the sound. Anchoring the intake or exhaust to walls or ceilings can cause noise to be transmitted to living areas. Where this must be done - use isolation mounts. Consult us if you have any questions.

SUGGESTED SPECIFICATIONS

Water Heater(s) shall be model BTH-_____ as manufactured by A.O. Smith. Water heater(s) shall be of the seamless glass lined steel tank construction in which the glass coating is applied to the water side surfaces of the tank after the tank has been assembled and welded. The condensing flue coil shall be coated on the flue gas side with A.O. Smith's proprietary acid resistant glass lining designed for use in condensing heaters.

The heater(s) shall be suitable for venting with (3" or 4")_____ diameter PVC pipe for a total equivalent distance of (50' or 120')_____ feet. [*alternative venting*: the heater shall be suitable for sealed combustion direct venting using a (3" or 4")_____ diameter PVC air intake pipe and (3" or 4")_____ diameter PVC exhaust pipe for a total distance of (50' or 120')_____ equivalent feet of vent and (50' or 120')_____ equivalent feet of intake.] The heater shall be factory assembled and tested. The power burner shall be of a design that requires no special calibrations on start up. The heater(s) shall be approved for 0" clearances to combustibles.

The control shall be an integrated solid state temperature and ignition control device with integral diagnostics, LED fault display capability and a digital display of temperature settings.

The tanks shall be foam insulated and equipped with a ASME rated temperature pressure relief valve. The water heater shall be UL listed and exceed the minimum efficiency requirements of ASHRAE/IES 90.1b-1992.

This heater shall be listed by SCAQMD Rule 1146.2 Low NOx.

Operation of the heater in a closed system where thermal expansion has not been compensated for with a properly sized thermal expansion tank will void the warranty.

A.O. Smith Water Products Co., Inc. On Line
www.hotwater.com

For Technical Information and
Automated Fax Service,
Phone: 800-527-1953

A. O. Smith
Water Products Company
Irving, TX
A Division of A. O. Smith Corporation

A. O. Smith Corporation reserves the right to make product changes
or improvements at any time without notice.

GI-1 GREASE INTERCEPTOR

GI-1 GREASE INTERCEPTOR

ZURN ZZ1170 Z-1170 GREASE INTERCEPTOR

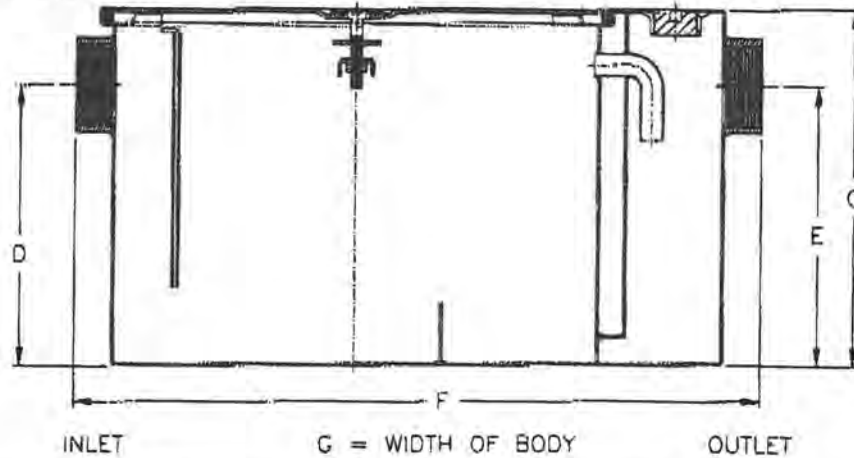


Z1170 GREASE INTERCEPTOR

SPECIFICATION SHEET

TAG _____

Dimensional Data (Inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



Z1170
E.g. V.
Rock - ...

Size	Inlet/ Outlet Size**	Flow Rate G.P.M. [L]	Capacity		Approx. Wt. Lbs. [kg]	Dimensions in Inches			
			Water Gal. [L]	Grease Lbs. [kg]		C	D/E	F	G
100	2 [50]	4 [15]	3 [11]	8 [4]	42 [19]	10 [254]	7 1/4 [184]	20 3/8 [518]	9 7/8 [251]
200		7 [26]	5 [19]	14 [6]	53 [24]	11 1/4 [286]	8 1/8 [206]	21 3/4 [552]	11 7/8 [302]
300		10 [38]	6 [23]	20 [9]	66 [30]	11 3/4 [298]	8 1/4 [210]	25 1/8 [638]	14 [358]
400	3 [75]	15 [57]	10 [38]	30 [14]	83 [38]	13 3/8 [340]	9 3/8 [238]	27 1/8 [689]	16 3/4 [425]
500		20 [76]	16 [60]	40 [18]	99 [45]	15 [381]	11 3/4 [298]	30 [782]	17 1/4 [438]
600		25 [94]	21 [79]	50 [23]	124 [56]	17 [432]	12 1/2 [318]	32 1/4 [819]	19 7/8 [505]
700		35 [132]	30 [113]	70 [32]	151 [68]	18 3/4 [476]	14 1/4 [362]	34 1/8 [867]	22 1/2 [572]
800		50 [189]	40 [151]	100 [45]	180 [82]	21 1/2 [546]	16 [406]	36 [914]	24 1/2 [622]

ENGINEERING SPECIFICATION: ZURN Z1170 Acid Resistant Coated interior and exterior fabricated steel grease interceptor, PD1, rated at _____ GPM and _____ Lbs. grease capacity, with internal air relief by-pass, bronze cleanout plug, removable pressure equalizing/flow diffusing inlet baffle, fixed bottom outlet baffles, and visible double wall trap seal. Gasketed non-skid secured cover complete with center tie down assembly, with Z1108 flow control fitting. Regularly furnished with a high inlet and outlet connection. Note: Location of outlet from bottom of interceptor cannot be changed.

PREFIXES

- Z Acid Resistant Coated Fabricated Steel*
- ZS All Type 304 Fabricated Stainless Steel

SUFFIXES

- AL Aluminum Cover
- DI Dual High/Low Inlet
- E Acid Resistant Coated Interior and exterior fabricated steel extension section. (Specify 'C' Dim. required) for recessed installation.
- HD Heavy Duty Cover rated at 10,000 lbs. maximum safe live load. A 3 [76] minimum extension height is required when Heavy Duty Cover (-HD) option is specified.
- K Anchor flange 1 3/4 [44] down from top and 2 [51] wide. A 3 [76] minimum extension height is required when anchor flange (-K) option is specified. (Specify 'C' Dim. height required.)
- KC Anchor flange 1 3/4 [44] down from top and 2 [51] wide with clamp collar. A 3 [76] minimum extension height is required when anchor flange (-K) option is specified.
- L Angle type (Z1108-L) flow control device with plunger.
- R Acid resistant coated interior and exterior fabricated steel recessing receiver for recessed installation is equipped with adjustable support brackets and gasketed non-skid cover with covered recessed lift handle.
- RE Acid resistant coated interior and exterior fabricated steel recessing receiver enclosed type for recessed installation. Furnished with adjustable support brackets and gasketed non-skid cover with covered recessed lift handle.
- T Cover recessed for tile/terrazzo. A 3 [76] minimum extension height is required. (Specify 'C' Dim. and required recess depth - 1/8 [3], 3/4 [19], or 1 1/4 [32]).
- ** Inlet and outlet sizes shown indicate standard operating sizes and flow control setting. Size #300 will have 3[75] connections reduced to 2[50] and sizes #600 thru #800 will have 4[100] connections reduced to 3[75] as standard. If changed, flow control must be adjusted accordingly.

4/20/07
3/44

REV. J	DATE: 4/10/03	C.N. NO. 90389
DWG. NO. 58905	PRODUCT NO. Z1170	

*REGULARLY FURNISHED UNLESS OTHERWISE SPECIFIED

ZURN INDUSTRIES, INC. • SPECIFICATION DRAINAGE OPERATION • 1801 Pittsburgh Ave. • Erie, PA 16514

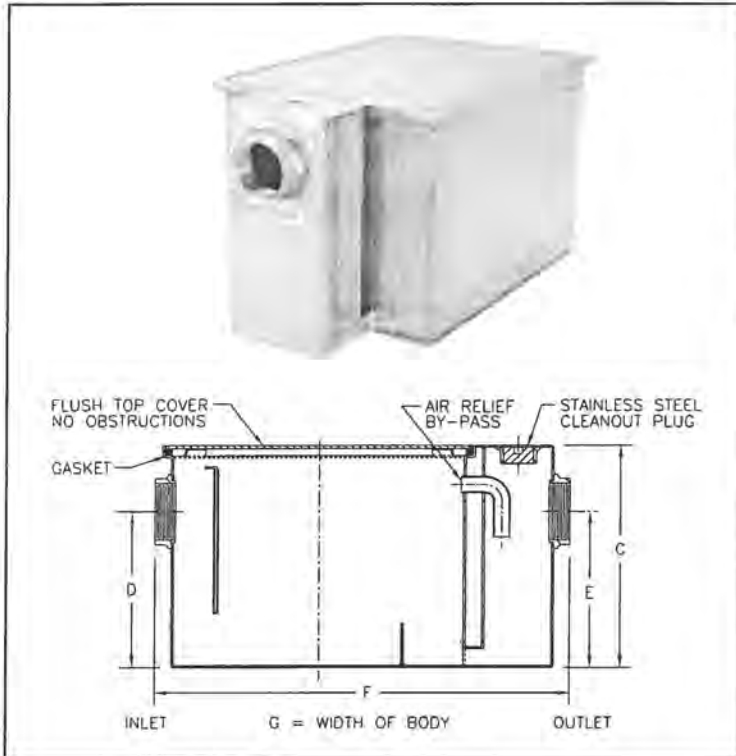
Phone: 814455-0921 • Fax: 814454-7829 • World Wide Web: www.zurn.com

In Canada: ZURN INDUSTRIES LIMITED • 3544 Nashua Drive • Mississauga, Ontario L4V1L2 • Phone: 905405-6272 Fax: 905405-1292

GREASE INTERCEPTORS



ZS1170 GREASE INTERCEPTOR



OPTIONS (See chart for pricing)

PREFIXES

ZS All Type 304 Fabricated Stainless Steel*

SUFFIXES

- | | |
|--|------------------|
| | ADD |
| -DI Dual High/Low Inlet | \$ 229.00 |
| -E Fabricated stainless steel extension section (specify 'C' dimension required) for recessed installation. | |
| -HD Heavy duty traffic cover rated at 10,000 lbs. maximum safe live load. A 3" minimum extension height is required when Heavy Duty Cover (-HD) option is specified. | |
| 100 | 7,098.00 |
| 200 | 7,952.00 |
| 300 | 8,547.00 |
| 400 | 9,196.00 |
| 500 | 9,736.00 |
| 600 | 10,278.00 |
| 700 | 11,359.00 |
| 800 | 11,902.00 |
| -K Anchor flange 1-3/4" down from top and 2" wide. A 3" minimum extension height is required when anchor flange (-K) option is specified (specify 'C' dimension required). | |
| -KC Anchor flange 1-3/4" down from top and 2" wide with clamp collar. A 3" minimum extension height is required when anchor flange (-KC) option is specified. | |
| -L Angle type (Z1108-L) flow control device with plunger. (Acid Resistant Coated cast iron.) | |
| -PW Plug Wrench | 46.00 |
| -R Fabricated stainless steel recessing receiver for recessed installation is equipped with adjustable support brackets and gasketed non-skid secured cover with removable lift handles. | |
| -RE Fabricated stainless steel recessing receiver enclosed type for recessed installation. Furnished with adjustable support brackets and gasketed non-skid secured cover with removable lift handles. | |
| -T Cover recessed for tile/terrazzo. A 3" minimum extension height is required. (Specify 'C' dimension and required recess depth: 1/8", 3/4", or 1-1/4".) | |

ENGINEERING SPECIFICATIONS

ZURN ZS1170 All Type 304 fabricated stainless steel grease interceptor, PDI rated at ___ GPM and ___ lbs. grease capacity, with internal air relief by-pass, stainless cleanout plug, and visible double wall trap seal with removable combination pressure equalizing/flow diffusing baffle and sediment tray. Gasketed non-skid secured cover complete with Z1108 flow control fitting. Regularly furnished inlet and outlet in high position.

Notes: Location of outlet from bottom of interceptor cannot be changed.

Solids should not be permitted to enter a grease interceptor. Where solids are present, use a Zurn Z1183 or Z1183-DF Solids Interceptor; see Pages 189 and 190.



Sizes 500-800

Size	Inlet/Outlet Size*	Flow Rate GPM	Capacity			Approx. Wt. Lbs.	Dimensions in Inches			
			Water Gal.	Grease Lbs.			C	D/E	F	G
100	2	4	3	8	42	10	7-1/4	20-3/8	9-7/8	
200		7	5	14	53	11-1/4	8-1/8	21-3/4	11-7/8	
300		10	6	20	66	11-3/4	8-1/4	25-1/8	14	
400	3	15	10	30	83	13-3/8	9-3/8	27-1/8	16-3/4	
500		20	16	40	99	15	11-3/4	30	17-1/4	
600		25	21	50	124	17	12-1/2	32-1/4	19-7/8	
700		35	30	70	151	18-3/4	14-1/4	34-1/8	22-1/2	
800		50	40	100	180	21-1/2	16	36	24-1/2	

Size	ZS*	ADD FOR SUFFIX							
		-E ('C' Dim.) (Specify Height)		-K	-KC	-R	-RE	-T	
		Up to 6"	Ea. 1" Over 6"						
100	\$ 3,609.00	-	-	-	-	\$ 8,288.00	\$ 9,478.00	-	-
200	5,010.00	-	-	-	-	9,494.00	10,949.00	-	-
300	5,885.00	\$6,573.00	\$325.00	\$2,052.00	\$2,469.00	9,893.00	11,470.00	\$2,933.00	
400	8,720.00	6,754.00	367.00	2,052.00	2,469.00	10,592.00	12,489.00	3,558.00	
500	10,671.00	6,754.00	415.00	2,211.00	2,469.00	11,275.00	13,461.00	3,979.00	
600	11,987.00	7,200.00	471.00	2,306.00	2,748.00	11,565.00	13,922.00	4,599.00	
700	14,817.00	8,072.00	521.00	2,416.00	2,965.00	12,075.00	15,173.00	5,645.00	
800	19,623.00	8,731.00	607.00	2,469.00	3,250.00	12,755.00	15,986.00	7,846.00	

*Regularly furnished unless otherwise specified.

Grease Trap Guidelines

What are Grease Traps?

Grease traps are devices placed on kitchen cleaning appliances such as sinks, woks, and any other drains that collect grease. Properly maintained grease traps help prevent unwanted grease build-up in

a private building's sewer or a Boston Water and Sewer Commission sewer.



Grease Traps are Required in Restaurants and Food Establishments

Cooking grease that gets washed off cooking appliances and kitchenware can end up causing significant problems in building drains and BWSC sewers. Commission regulations governing the use of sanitary and combined sewers and storm drains require properly installed and maintained grease traps in all restaurants and food establishments in Boston. Article 111, Section 15 states "Grease traps shall be required on sewers into which significant amounts of animal or vegetable fat, oil or grease may be discharged so that a discharge concentration does not exceed 100 milligrams per liter...the Commission shall have the right to inspect such facilities in accordance with Article VII of these regulations." For a complete copy of the regulations, please contact BWSC at (617) 989-7000.



Click for larger view

Are There Different Types of Grease Traps?

Two Types of grease traps exist:

- Traps located in an establishment near the fixture it serves.
- Large traps located outside the building in the ground that serve the entire kitchen.

What Fixtures in my Food Establishment Require a

How Do I Clean the Grease Traps and How Often?

These methods of cleaning are for guideline purposes only; many traps are designed differently and require specific methods for cleaning. Consult the equipment manufacturer for instructions.

- Grease traps should be cleaned when 25% of the liquid level of the trap is grease or oil, once a month minimum for point of use traps and quarterly for large in-ground interceptors.
- The cover should be removed carefully to avoid damage to the gasket.
- Ladle off the layer of grease and oil floating on top of the water.
- Remove any baffles and scrape clean. After cleaning, the baffles can be rinsed off in the sink that flows to the trap.
- Using a strainer, scrape the bottom of the trap to remove all non-floatable food particles and debris.
- Clean the bypass vent with a flexible probe or wire.
- Reinstall baffles and cover.

Note: The grease trap should be completely emptied once a month. Many establishments have an independent contractor that specializes in grease trap cleaning perform the work.

All interior grease trap installations are subject to state and local plumbing codes.

Can I Add Cleaning Agents to Help Clear the Grease Faster?

No. Never add bleach, emulsifiers, enzymes, or any other chemical to the grease trap. These agents harm the natural bacteria that eat grease and oil in grease traps. The only additive allowed into the sewer system by BWSC is bacteria. Bacteria consume fat, oil and grease in the trap, turning them into water and carbon dioxide.

What Methods of Disposal are Available for Used Grease?

The food establishment's waste hauler or renderer that removes used fryolator grease and oil normally accepts materials removed

Grease Trap?

Significant amounts of grease in buildings and BWSC sewers can come from the following fixtures:

- Pot Sinks
- Rinse Sinks at Dishwashers¹
- Dishwashers Outside Trap Only²
- Woks
- Floor Drains and Sinks
- Automatic Hood Washers

- | |
|--|
| <ol style="list-style-type: none">1 Garbage disposals should not be installed on these sinks2 Dishwashers cannot flow through a point of use trap inside a building |
|--|

from the grease trap. Large in-ground grease traps normally hold 500 gallons or more and are usually cleaned by a contractor equipped to deal with the large quantities of grease, oil and non-floatables. It is the responsibility of the establishment owner to ensure the trap is completely cleaned.

How May I Receive Assistance from BWSC for Cleaning?

BWSC will provide Grease Control Logs for the establishment owner to maintain regarding the cleaning of the Establishment's grease traps. The log notes the date the trap is cleaned, amount of material removed, and a signature confirming the work was performed.

Proper maintenance of grease traps is essential to the smooth and sanitary operation of a food establishment.

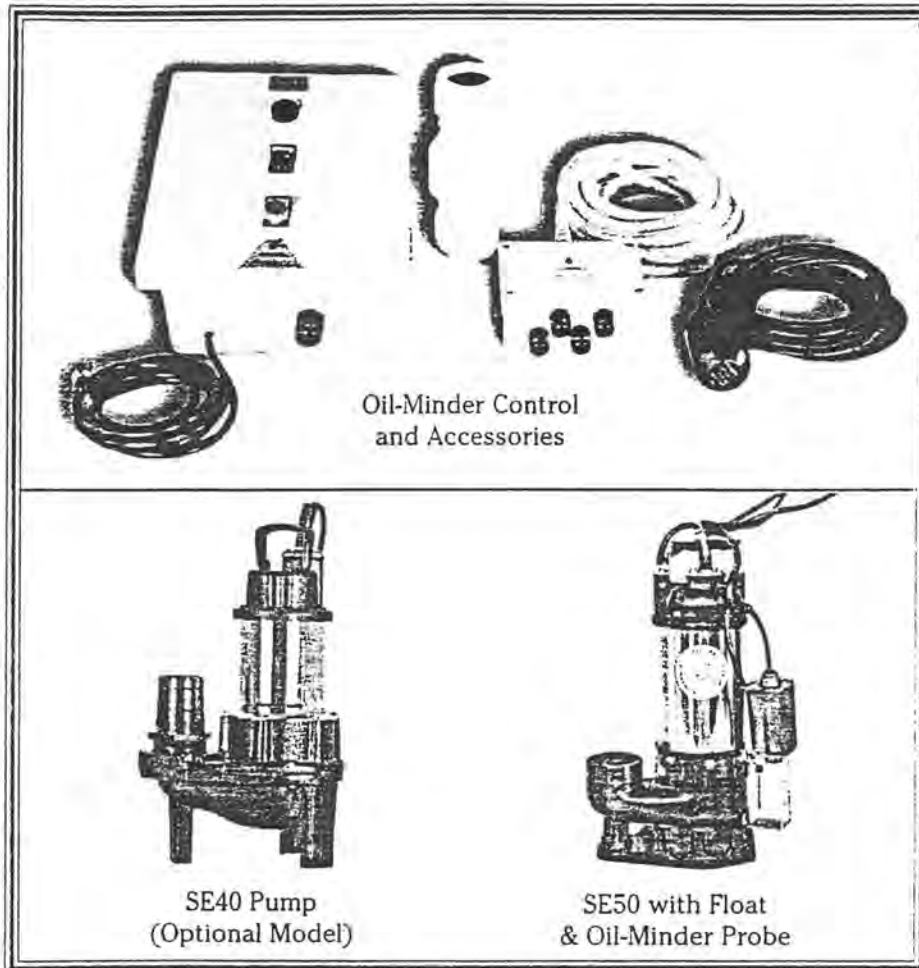
For additional information regarding the proper maintenance and care of grease traps, please contact BWSC's Discharge Enforcement Unit at (617) 989-7000.

SP-1 ELEVATOR SUMP PUMP

SP-1 ELEVATOR SUMP PUMP

STANCOR SSE50 STANCOR 1/2 HP 120VAC PUMP SYSTEM

STANCOR *Elevator Pit* Oil-Minder® Control System

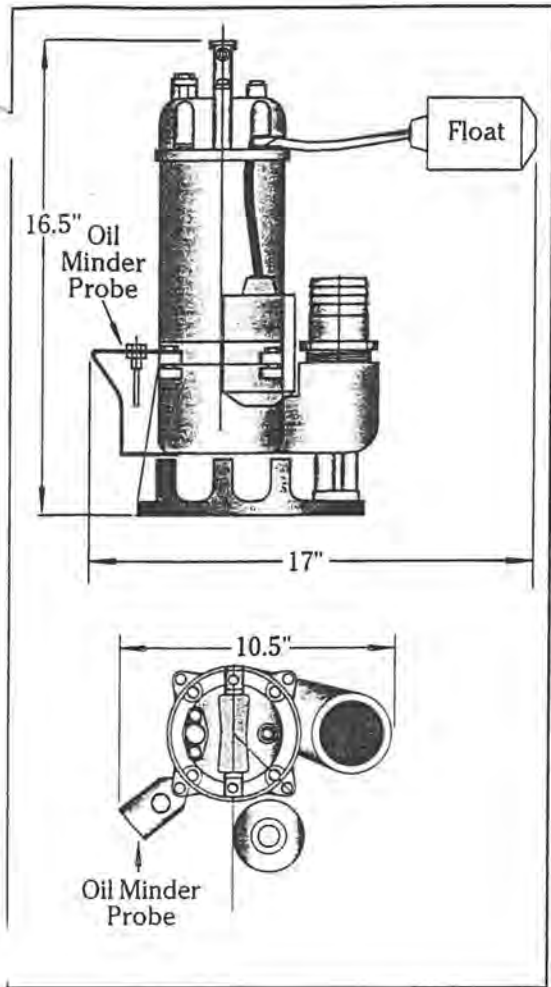


The Stancor Oil-Minder Control System, when combined with a pump, allows water to be automatically pumped from elevator pits in accordance with ASME A17.1 without danger of ejecting potentially harmful oily substances into sewers, rivers and waterways. The product is engineered for efficient and trouble free pumping, even under the most severe conditions. The patented oil-minder system has a proven record of protecting valuable equipment and the environment while being extremely cost effective.

Features

- NEMA 4x weathertight corrosion resistant fiberglass enclosure
- Stainless steel sensor probe
- Single direct plug-in power source for efficient, economical hook-up
- Alarm, light, and remote monitoring circuit for hydraulic oil, high liquid or high amp. alert
- Complete factory packaging insures quality of entire control and pump system
- Patented - Pat. #4,715,785, #4,752,188, #6,203,281 and others pending
- Oil-minder system can be combined with a variety of different pumps and valves to meet non-standard requirements
- Choice of: 115v or 220v (1 phase) OR 230v/460v/575v (3 phase)
- Approved to UL508 and UL778 Standards
- ENTELA tested and certified

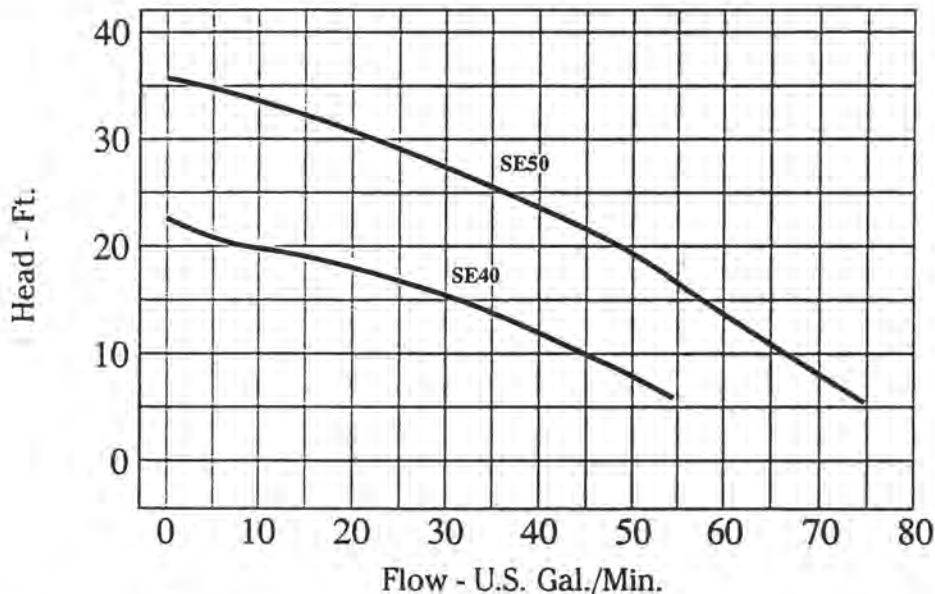
Quality You Can Believe In



The Stancor Oil-Minder Pump System is the overwhelming choice among design engineers and compliance authorities throughout the U.S. and abroad. The Oil-Minder System provides continuous, automatic operation without need for a separate oil-water separator. Local and remote audio and visual warning systems are provided separately for (a) hydraulic oil spill alert (b) high liquid condition, and (c) high amperage. Local alarms and a remote monitoring circuit are provided as standard features. An optional remote alarm is also available.

The system is designed for easy, fool-proof installation. All pump and control cables are factory wired into a wall mountable junction box. Between the junction box and the main Oil-Minder control panel are multi-pin quick control connectors. This single cable, 8-pin system allows the electrical cable between the junction box and control panel to be run through conduit and interconnected up to 200 feet long, using a single "push and turn" motion. There is no need for field wiring and all connections are secure and water-tight.

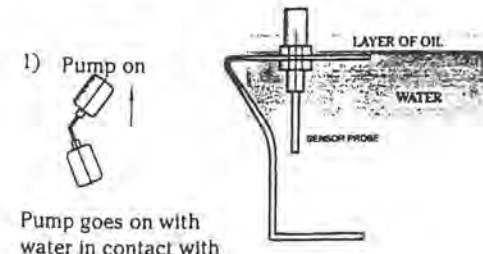
While the Oil-Minder SE-50 is our most popular model, Stancor can provide custom systems for virtually any application up to 45 H.P., including duplex controls.



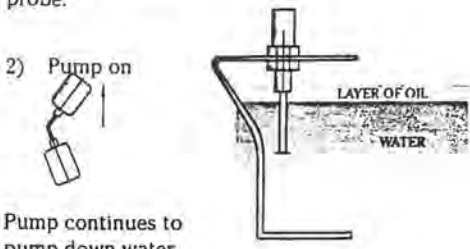
General & Electrical Specifications

Model	H.P.	Voltage	RPM	Rated Full-Load Amps	Discharge Size	Max Head Ft.	Max Flow GPM	Weight Lbs.	Height In.	Width In.
SE50	0.5	115 or 230	3600	5/2.5	2"	37'	74	30.8	16.2"	9.1"

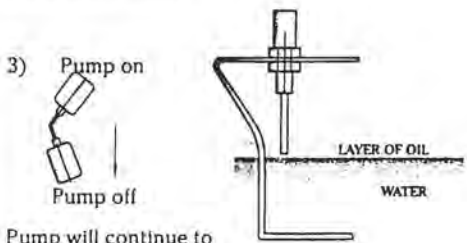
How the Stancor Oil Minder System Works:



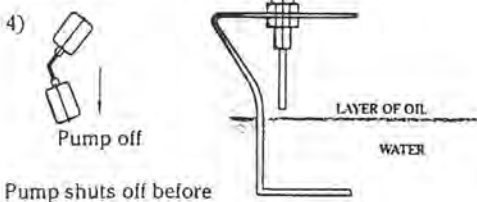
Pump goes on with water in contact with low voltage sensor probe.



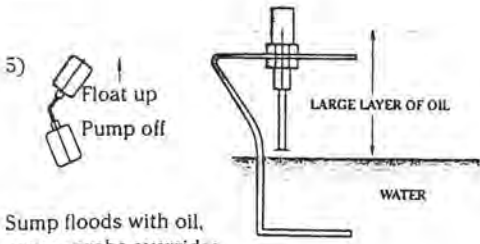
Pump continues to pump down water



Pump will continue to run, pumping water only until
 1) pump switch reaches "off" position (3" from bottom of sump) or
 2) only oil is in contact with sensor probe, eliminating electrical conductivity



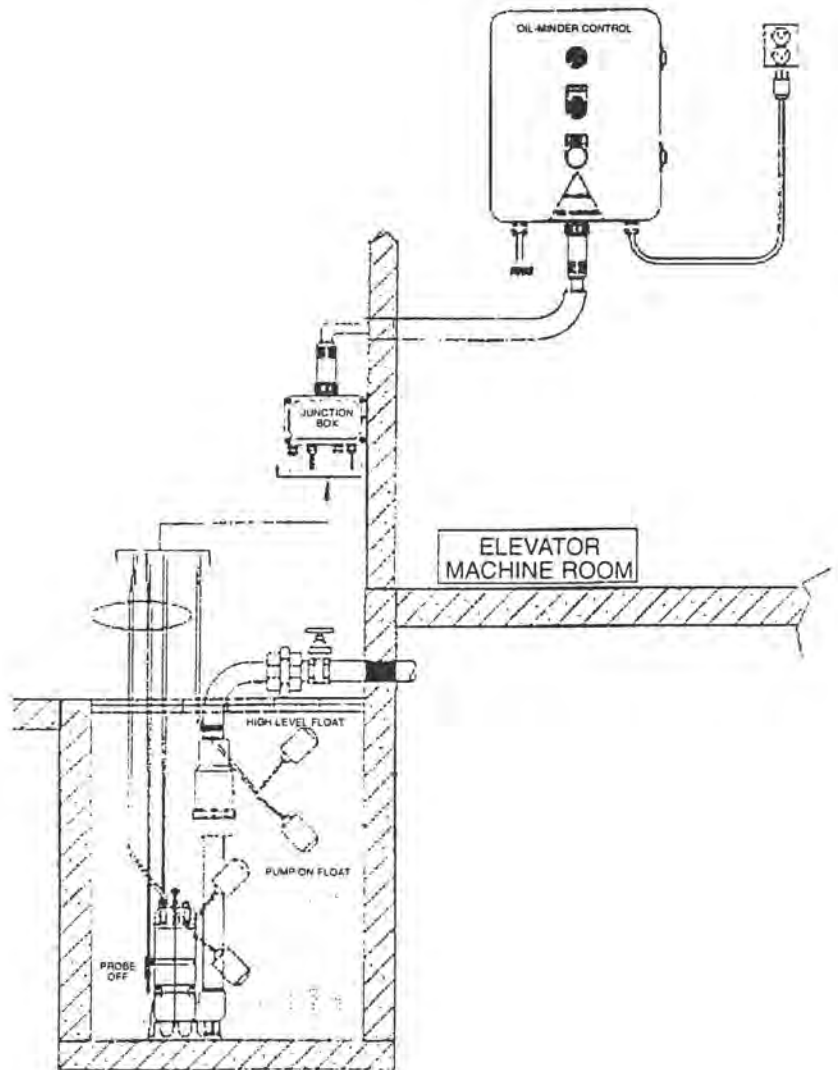
Pump shuts off before oil is pumped, leaving approximately 3" of liquid in bottom of sump.



Sump floods with oil, sensor probe overrides pump switch and pump remains off. (Oil is contained and oil alert is activated).

Stancor Oil-Minder SE50 Pump & Oil-Minder Control

*Stancor
Rich Millinger
1-203-268-7513*



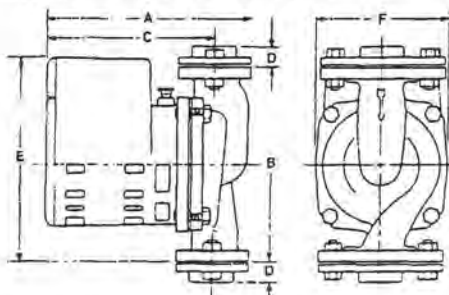
See back page for illustration of typical engineered Oil-Minder® Control and Pump System (Type SE-50)

RP-1 CIRCULATING PUMP

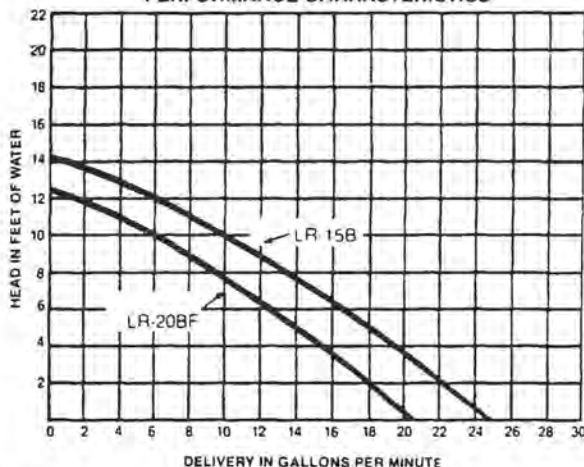
DIMENSIONS AND WEIGHTS

Model No.*	Flange Size Inches NPT	Motor HP	Dimensions												Approx. Shpg. Wt.				
			A		B		C		D		E		F		Iron	Bronze			
			In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	Lbs.	kg	Lbs.	kg	
LR-20BF	3/4	1/20	6-15/16	176	6-3/8	162	5-5/8	143	9-1/16	14	6-11/16	170	4-3/8	111	10.4	4.7	—	—	
	1 & 1-1/4								1-1/2	15-1/16									24
LR-15B	3/4	1/12	7-15/16	202	6-5/8	168	6-5/8	168	9-1/16	14	6-11/16	170	4-3/8	111	—	13.1	5.9	—	
	1 & 1-1/4								1-1/2	15-1/16									24
	1-1/2								15-1/16	24									

Dimensions are approximate and subject to change. Contact factory for certified dimensions.



PERFORMANCE CHARACTERISTICS



TYPICAL SPECIFICATIONS

The contractor shall furnish and install inline pumps as illustrated on the plans and in accordance with the following specifications:

1. The pumps shall be of the horizontal, oil-lubricated type, specifically designed and guaranteed for quiet operation, and suitable for 125 (PSI) working pressure.
2. The pumps shall have a steel shaft supported by a horizontal sleeve bearing designed to circulate oil. The pumps are to be equipped with a water-tight seal to

prevent leakage. Mechanical seal faces to be carbon on ceramic. The motor shall be non-overloading at any point on the pump curve.

3. The motor shall be of the drip-proof, sleeve-bearing, quiet-operating construction. The permanent split-capacitor motor shall be equipped with thermal overload protection.

The pump shall be ITT Bell & Gossett Model No. _____ with a capacity of _____ GPM at _____ ft. head.

For further information, contact ITT Bell & Gossett, 8200 N. Austin Avenue, Morton Grove, IL 60053. Phone: (708) 966-3700 — Telex 4949943 — Facsimile (708) 966-9052.

ITT Bell & Gossett
ITT Fluid Technology Corporation

PRINTED IN U.S.A. 3-89

A-1 AQUASTAT

A-1 AQUASTAT

HONEYWELL HL6006C1018 HONEYWELL AQUASTAT STRP ON SPDT 5-3

L6006 and L6007 Aquastat® Controllers

Installation Instructions for the Trained Service Technician.

Application

These Aquastat® Controllers operate in response to temperature changes in hydronic heating systems. They provide spdt switching for three-wire applications.

The L6006A,B, and L6007A combine low or high limit and circulator control; L6006C combines circulator control with low and high limit.

The L6006A,B are for horizontal insertion; the A model uses an immersion well; the B model uses a capsule compression fitting for direct immersion. The L6006C is for horizontal or vertical surface mounting. The L6007A is for horizontal or vertical insertion using an immersion well.

If immersion well or capsule compression fitting must be ordered, refer to form 68-0040, Wells and Fittings for Temperature Controllers, for part numbers and ordering information.

ELECTRICAL RATINGS (A):

	120 Vac	240 Vac
Full Load	8	5.1
Locked Rotor	48	30.6
Inductive Current	0.25 at 1/4 to 12 Vdc	

Installation

WHEN INSTALLING THIS PRODUCT...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.



WARNING

CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY OR DEATH.

This product is intended for use only in systems with a pressure relief valve.



CAUTION

Disconnect power supply before connecting wiring to prevent electrical shock or equipment damage.

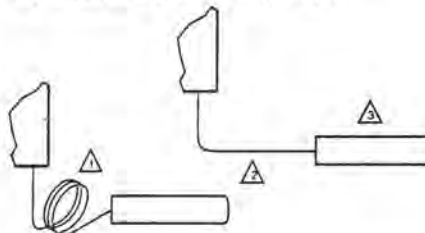
IMPORTANT: Controller can be used with or without immersion well. If used, well must snugly fit sensing bulb for good thermal response. Bulb should be inserted until it rests against bottom of well, and then held there while the tubing clamp is tightened.

NOTE: Some models have an adjustable tubing length to 3 in. (76 mm). In these models, extra tubing inside the case can be pulled out, if needed. See Fig. 1.

The manufacturer usually provides a tapping for insertion of the controller sensing element. This tapping is located at a point where typical water temperature can be measured. Depending on model, the element is inserted in an immersion well or directly immersed through a capsule compression fitting.

Follow the instructions furnished by the system manufacturer, if available; otherwise, refer to the appropriate following procedure.

Fig. 1—Adjusting the capillary length.



CAUTION:
EXCESSIVE HANDLING OR SHARP BENDS
CAN DAMAGE THE CAPILLARY.

⚠ SENSING ELEMENT IS FACTORY FORMED FOR 1.5 INCH INSULATION WELL ASSEMBLIES

⚠ FOR 3 INCH INSULATION WELL ASSEMBLIES, PULL OUT SUFFICIENT CAPILLARY TO ASSURE THAT THE CAPSULE BOTTOMS IN THE WELL.

⚠ STRAIGHTEN CAPILLARY SUFFICIENTLY SO IT DOES NOT INTERFERE WITH INSERTING THE CAPSULE INTO THE WELL.

M6882

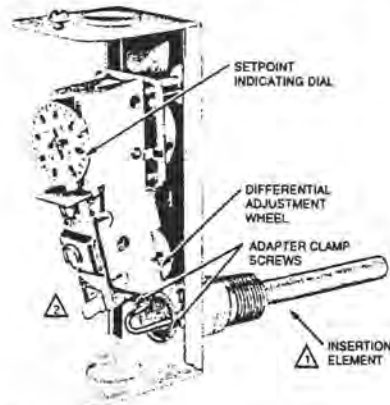
INSTALLING IMMERSION WELL MODELS (L6006A, L6007A)

On existing installation, shut off the power and remove the old control. If the old immersion well appears suitable, and the adapter clamp on the Aquastat® Controller fits the old well spud, do not replace.

1. If the system is filled, drain system to a point below the boiler tapping.

2. Remove plug (or old well) from boiler tapping.
3. Install the immersion well included with the controller. If boiler tapping is greater than 1/2 in., use a reduction fitting to adapt the boiler opening to the 1 in. threads that are standard with the well or fitting. Fittings with 3/4 in. threads are also available.
4. Fill the system. Make sure that the well is screwed in tightly enough to prevent leakage. Do *not* tighten after controller is secured to well because of possible excessive force on the case.
5. Loosen screw (at top of case, above scale setting), and remove cover. Loosen two screws that secure adapter clamp. See Fig. 2.
6. Insert the sensing element into the immersion well.
7. Fasten the case of the Aquastat® Controller to the well with the adapter clamp. Make certain that the clamp is properly positioned over the groove of the well spud. Also, be sure the flange at the opening of the well fits snugly into the opening of the case. The sensing element bulb must bottom in the well.

Fig. 2—Internal view of L6006A,B (L6006C and L6007 are similar in appearance).



- ⚠ WITH VERTICAL MOUNTING OF IMMERSION WELL, ELEMENT IS ATTACHED TO BOTTOM OF THE CASE.
- ⚠ SELECT MODELS HAVE SCREW TERMINAL, NOT TAB TERMINAL.

INSTALLING DIRECT IMMERSION MODELS (L6006B)

Install fitting in boiler tapping as follows:

1. Be sure sealing washer is in place as shown in Fig. 3. Make sure that spud of capsule compression fitting is screwed in tightly enough to prevent leaking.
2. Insert immersion bulb (sensing element) through capsule compression fitting. Adjust the adapter clamp so that it fits over the groove at the opening of the capsule compression fitting.
3. Tighten adapter clamp screws so the Aquastat® Controller is firmly attached to the capsule compression fitting.

INSTALLING SURFACE-MOUNTED MODEL (L6006C)

⚠ CAUTION

- Do not replace immersion type Aquastat® Controller with strap-on Aquastat® Controller.
- When mounting the L6006C, do not secure draw nut so tight that retainer clamp could collapse tubing.

NOTE: When mounting the L6006C on piping, use 1 in. (25.4 mm) diameter or larger pipe for accurate temperature sensing. Remove any insulation from the pipe. Thoroughly scrape off all scale, rust, or paint. Mount the controller using the adjustable bracket furnished.

The L6006C is designed for surface mounting on piping or tanks. Mount the L6006C directly on the tank surface using the adjustable mounting bracket as shown in Fig. 4. The control can be mounted in any position. (If mounting the L6006C on piping, see NOTE above.)

WIRING

Disconnect power supply before connecting wiring to prevent electrical shock or equipment damage. All wiring must comply with local electrical codes and ordinances.

Fig. 5 and 6 show typical wiring diagrams of Aquastat® Controllers used in heating systems.

When the W terminal on the device being replaced is a 1/4 in. tab terminal, use the existing wiring harness terminals to install the replacement device. When the W terminal on the device being replaced is a screw terminal, connect the provided wire harness adapter on the 1/4 in. tab terminal of the replacement device. Connect the existing wire to the adapter harness using the provided wire nut.

Operation

For proper selection of settings, follow the boiler manufacturer recommendations.

High limit controller—shuts off burner when water temperature exceeds high limit setting. Burner restarts when temperature drops to high limit setting, less differential.

Low limit controller—maintains minimum boiler temperature for domestic hot water. Turns on burner at temperature setting, minus differential.

Circulator controller—prevents circulation of water that is not hot enough. Breaks circulator circuit at temperature setting minus differential; remakes the circuit when the temperature setting is reached.

Switching action is as follows:

Upon a drop in boiler water temperature (to dial setting, less differential), makes R to B burner contact; breaks R to W contact, preventing circulator operation. Upon a rise in boiler water temperature (to dial setting), breaks R to B burner contact, makes R to W circulator contact.

Adjustment

Set the differential to correspond with the boiler manufacturer recommendations. To adjust models with adjustable differential, rotate the wheel on the back of the snap switch until the desired reading is aligned with the V notch in the frame. The wheel provides an adjustment from 5°F to 30°F (3°C to 17°C). Replace the cover on the Aquastat® Controller.

Adjust control point to correspond with the boiler manufacturer recommendations. To adjust, insert a screwdriver in the slotted screw type head located beneath the window in the cover. Turn the scale to the desired control point.

Fig. 3—Direct immersion model with bulb compression fitting partially removed.

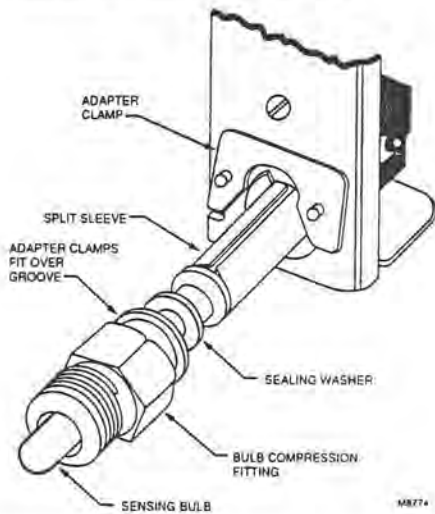


Fig. 4—Mounting L6006C on pipe or tank.

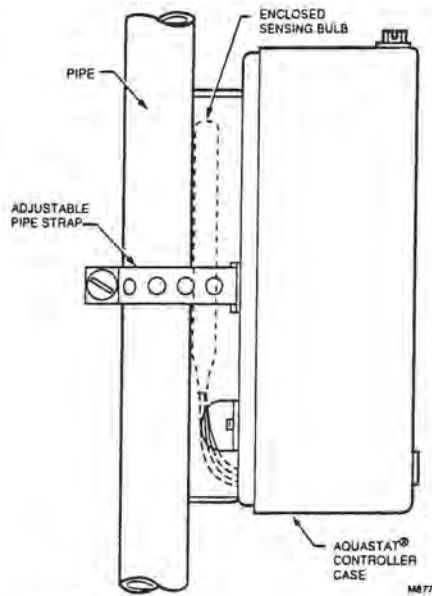


Fig. 5—Typical wiring hookup using the L6006 or L6007 for low limit and circulator control in oil-fired hydronic system.

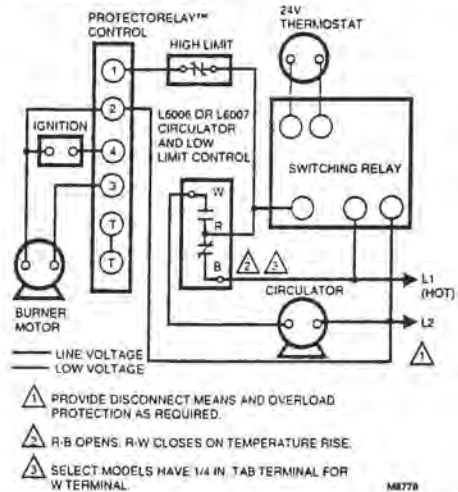
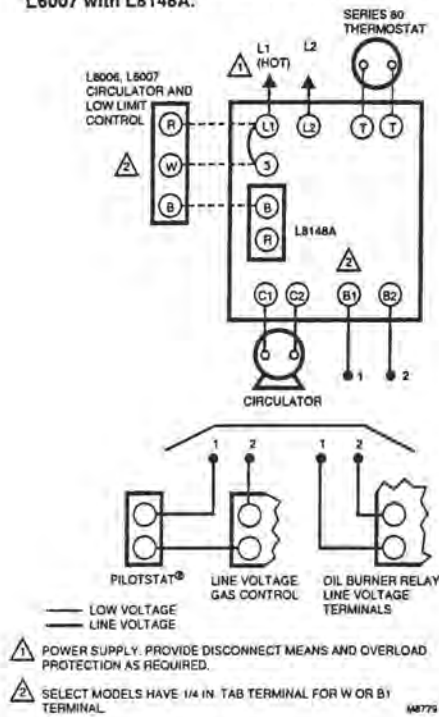


Fig. 6—Typical wiring hookup using L6006 and L6007 with LB148A.



Checkout

Check to make certain that the Aquastat® Controller is installed and adjusted properly. Put the system into operation and observe the action of the device through several cycles to make certain that it provides proper low and/or high limit and circulator control.

Honeywell

Home and Building Control
Honeywell Inc.
1985 Douglas Drive North
Golden Valley, MN 55422

Home and Building Control
Honeywell Limited—Honeywell Limitée
740 Ellesmere Road
Scarborough, Ontario
M1P 2V9

Helping You Control Your World

Printed in U.S.A.

QUALITY IS KEY

CBV-1 CIRC BALANICNG VALVE

CBV-1 CIRC BALANICNG VALVE

VICTAULIC VV006786CBV 3/4 SWT CIRC BALANCING VLV STAS

TA Hydronics Circuit Balancing Valves

PRODUCT DESCRIPTION

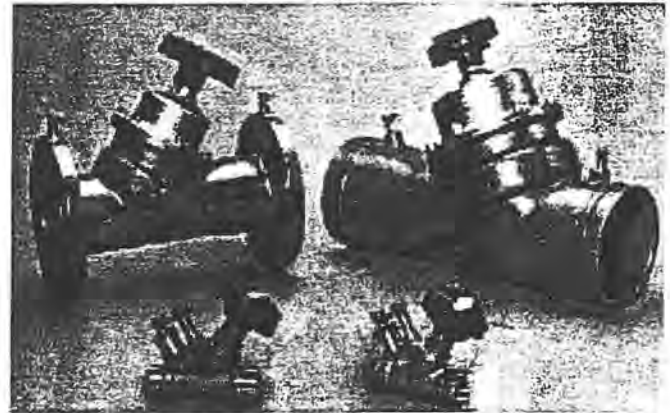
The TA Hydronics balancing valves offer a reliable, simple and cost effective way to measure and balance all flow rates. Full throttling range is achieved by 4, 8, 12 or 16 full turns of the handwheel, enabling a precise setting. This high degree of accurate adjustment means that the system now can be balanced precisely.

The actual pressure drops in heating and cooling systems are difficult to establish by calculation. The water flows are frequently incorrect. They can be corrected easily by regulating the desired water flow with TA Hydronics Globe Style Balancing Valves. By measuring the pressure drop across measuring ports at a particular handwheel setting, the water flow for the

valve size can be read easily from the appropriate pressure drop graph or flow balancing wheel. If the flow does not conform with that specified, reset the valve and repeat the measuring procedure until the correct flow has been obtained. Insulation kits are available for 1/2" - 6" (15 - 150 mm) sizes for Series 786, 787, 788 and 789 TA Circuit Balancing valves.

NOTE: All TA Hydronics Circuit Balancing Valves include a concealed memory feature with a locking tamper-proof setting. (This feature not available with Series 785.)

Series 785, 786 and 787 have an Ametal body. Ametal is a copper alloy that also eliminates the added expense of dielectric fittings.



Series 788 and 789 have ductile iron bodies and Ametal or ductile iron trim, depending on size. Test points feature self-sealing construction for insertion-type pressure or temperature probes.

All valves are rated to +250°F (+120°C) and -4°F (-20°C), except for the Series 789 which is rated to +230°F (110°C). Service will be governed by the connecting coupling gasket ratings for grooved and flanged valves.

DIMENSIONS

Bypass Valves Series 782 & 783

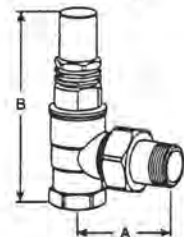
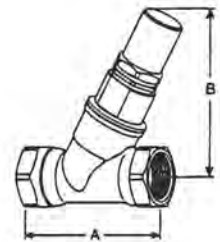
TA Hydronics bypass valves stabilize differential pressure for better flow control. Series 782 and Series 783 bypass valves are installed between the supply and return pipe in conjunction with TA Hydronic circuit balancing valves. The Series 782 and 783 valves are adjustable and will open at a preset differential pressure making possible the maintenance of the design differential pressure in the distribution system.



These bypass valves convert a variable flow distribution system into a constant flow distribution system. Series 782 and 783 bypass valves are rated for 300 psi (2065 kPa) service to a maximum temperature of 250°F (120°C).

Valve Size		Series 782 Straight		Aprx. Wgt. Each Lbs. kg
Nom. Dia. In. mm	Act. Out. Dia. In. mm	A End to End	B Center to Top	
1/2 20	1,050 26.7	3.35 85	3.66 93	1.2 0.5
1 25	1,315 33.7	3.86 98	4.06 103	1.9 0.6

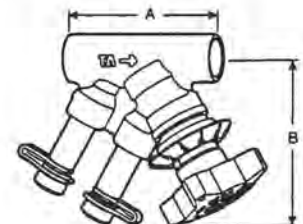
Valve Size		Series 783 Angle		Aprx. Wgt. Each Lbs. kg
Nom. Dia. In. mm	Act. Out. Dia. In. mm	A Center to End	B Height	
1/2 20	1,050 26.7	2.76 70	4.80 122	1.3 0.6
1 25	1,315 33.7	3.27 83	5.40 138	1.5 0.7



Series 785

Solder Style (125 psi)
The Series 785 valves are designed for soldered installation in heating and cooling systems.

Valve Size		Dimensions Inches/millimeters		Approx. Weight Each Lbs./kg
Nominal Diameter In./mm	Actual Outside Dia. In./mm	End to End A	Hgt. B	
1/2 20	0.840 21.3	2.68 68	2.83 72	1.0 0.5
3/4 20	1.050 26.7	3.42 87	3.07 78	1.0 0.5



VICTAULIC® IS AN ISO 9001 CERTIFIED COMPANY

Victaulic Company of America
Phone: 1-800-PICK-VIC (1-800-742-5842)
Fax: 610-250-8817
e-mail: pickvic@victaulic.com

Victaulic Company of Canada
Phone: 416-675-5575
Fax: 416-675-5565
e-mail: viccanada@victaulic.com

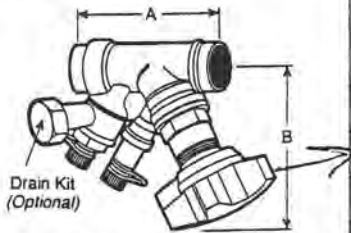
Victaulic Europe
Phone: 32-9-381-1500
Fax: 32-9-380-4438
e-mail: viceuro@victaulic.be

Victaulic America Latina
Phone: 610-559-3300
Fax: 610-559-3608
e-mail: vical@victaulic.com

Victaulic Asia Pacific
Phone: 65-6235-3035
Fax: 65-6235-0535
e-mail: vicap@victaulic.com

Series 786

Solder End (300 psi)

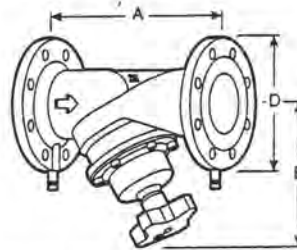


Series 786 is a solder-end valve for balancing flows in heating/cooling systems. Series 786 includes self-sealing EPDM measurement points and an EPDM seat. An optional drain kit (K-000-786-CBV) is available.

Valve Size		Dimensions Inches/mm		Aprx. Wgt. Each Lbs. / kg
Nom. Dia. In. / mm	Act. Out. Dia. In. / mm	E to E A	Hgt. B	
1/2	0.840	3.50	4.00	1.4
3/4	1.050	3.81	4.00	1.4
1	1.315	4.31	4.50	1.9
1 1/4	1.660	4.88	4.31	2.4
1 1/2	1.900	5.13	4.75	3.1
2	2.375	6.13	4.75	4.5

Series 788

Flanged End (250 psi)

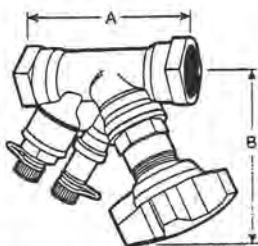


Series 788 is a flanged end valve (Class 150, ASME/ANSI B16.42) for balancing flows in heating and cooling systems. Series 788 includes self-sealing EPDM measurement points and an EPDM seat.

Valve Size		Dimensions Inches/mm		Aprx. Wgt. Each Lbs. / kg
Nom. Dia. In. / mm	Act. Out. Dia. In. / mm	E to E A	Hgt. B	
2 1/2	2.875	11.38	8.00	24.0
3	3.500	12.25	8.63	31.0
4	4.500	13.75	9.44	43.0
5	5.563	15.75	10.88	62.0
6	6.625	18.88	11.25	82.0
8	8.625	23.63	17.00	168.0
10	10.750	28.75	17.75	270.0
12	12.750	33.50	19.00	360.0

Series 787

NPT (Fem.) End (300 psi)

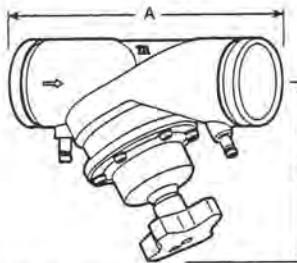


Series 787 is an NPT female threaded end valve for balancing flows in heating/cooling systems. Series 787 includes self-sealing EPDM measurement points and an EPDM seat. An optional drain kit (K-000-786-CBV) is available.

Valve Size		Dimensions Inches/mm		Aprx. Wgt. Each Lbs. / kg
Nom. Dia. In. / mm	Act. Out. Dia. In. / mm	E to E A	Hgt. B	
1/2	0.840	3.50	4.00	1.5
3/4	1.050	3.81	4.00	1.6
1	1.315	4.31	4.50	2.0
1 1/4	1.660	4.88	4.31	2.6
1 1/2	1.900	5.13	4.75	3.3
2	2.375	6.13	4.75	5.0

Series 789

Grooved End (350 psi)

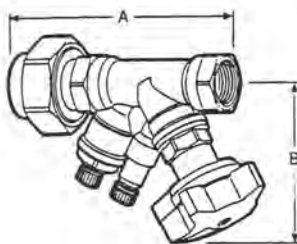


Series 789 is a grooved end valve for balancing flows in heating and cooling systems. Series 789 includes self-sealing EPDM measurement points and an EPDM seat.

Valve Size		Dimensions Inches/mm		Aprx. Wgt. Each Lbs. / kg
Nom. Dia. In. / mm	Act. Out. Dia. In. / mm	E to E A	Hgt. B	
2 1/2	2.875	11.38	8.00	14.0
3	3.500	12.25	8.63	20.0
4	4.500	13.75	9.44	31.0
5	5.563	15.75	10.88	50.0
6	6.625	18.88	11.25	69.0
8	8.625	23.63	17.00	140.0
10	10.750	28.75	17.75	202.0
12	12.750	33.50	19.00	280.0

Series 787-U

(300 psi)



Series 787-U connects directly to coil outlets and provides a break for system maintenance. An optional drain kit (K-000-786-CBV) is available.

Valve Size		Dimensions Inches/mm		Aprx. Wgt. Each Lbs. / kg
Nom. Dia. In. / mm	Act. Out. Dia. In. / mm	E to E A	Hgt. B	
1/2	0.840	4.81	4.00	1.7
3/4	1.050	5.13	4.00	1.8
1	1.315	6.00	4.50	2.2

Series 786-DK

Drain Kit

A separate drain kit with a 3/4" (20 mm) connection is available for Series 786 and Series 787 valves. This kit must be field mounted.



PRV-1 PRES REDUCING VALVE

PRV-1 PRES REDUCING VALVE

WATTS W25AUB 25AUB SERIES PRESSURE REGULATOR



water pressure reducing valves



Series U5 and 25AUB meet the requirements of A.S.S.E. Std. 1003, ANSI A112.26.2, CSA Std. B356; Southern Standard Plumbing Code and are listed by IAPMO.

Series U5, U5B Standard Capacity Water Pressure Reducing Valve with Integral Strainer

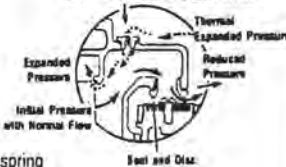
For residential, commercial and industrial applications. Furnished with NPT union inlet and NPT female outlet, for sizes 1/2" through 2". Suitable for initial pressures up to 300 lbs. Reduced pressure range 25-75 lbs. Set for 50 lbs. no flow pressure unless otherwise specified. Maximum temperature 160°F.

- Bronze body construction
- Stainless steel integral strainer
- Renewable stainless steel seat
- High temperature resistant diaphragm



No. U5B-GG

U5B BY-PASS FEATURE



OPTIONS 1/2" - 1" (Suffix):

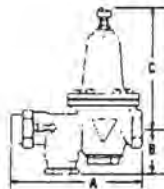
- S - Sweat union inlet connections
- G - with gauge tapping
- LP - Low pressure range 10-35 lbs. Set for 30 lbs. no flow pressure. Max. pressure 200 lbs. Max. Temp. 180°F.
- Z3 - for waterworks pit installations. Has sealed spring cage and stainless steel adjusting and cage screws.
- SC - Sealed spring cage for hi-rise applications.

Consult factory for:

- QT - Built-in 1/4-turn shut-off on inlet threaded union connection
- QT-S - Built-in 1/4-turn shut-off on inlet, solder union connection

OPTIONS 1/2" - 2" (Suffix):

- GG - with 160 lb. gauge and tapping
- HP - High pressure range 75-100 lbs. Set for 90 lbs. no flow pressure.



SPECIAL MODELS:

No. 5M3-Z6 - with water meter thread connections and 7 1/2" lay length for new or existing meter box installations. For 5/8", 5/8" x 3/4", or 3/4" meter setters or resetters.

No. U5-Z9 - with 3/4" NPT threaded male union inlet connection and 3/4" NPT threaded female outlet connection.

Series U5B Sizes 1/2" - 2" has built-in thermal expansion by-pass equalizing feature to relieve thermal expansion in closed systems.

However, to be effective, the pressure relief setting of a relief valve must be higher than the available supply main pressure to the reducing valve. Latest allowable working pressure standards for gas and electric water heaters is 150 lbs. which exceeds the majority of supply pressures.

Size (Inches)	DIMENSIONS (Inches)			Weight (lbs.)
	A	B	C	
1/2	5 3/4	1 3/4	5	4
3/4	6 3/4	1 3/4	5 3/4	5
1	6 3/4	2	6	6
1 1/4	8	2 1/4	6 3/4	9 3/4
1 1/2	9 1/2	3	6 3/4	14 3/4
2	11	3 3/4	9	23

*U5 available in 1/2", 3/4" and 1" size only.

FLOW CAPACITIES

Chart shows the flow capacities in gallons per minute based on average conditions and reduced pressure fall-off due to demand. For specific capacities under various flow conditions, send for F-U5.

Capacities shown are based on a difference of 50 lbs. or more between the initial pressure and the regulator lock-up pressure. Where this difference is less than 50 lbs., deduct 20% from capacity shown.

Series	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
U5, U5B	17	27	40	50	64	100	-	-	-
25AUB	16	25	38	52	60	85	-	-	-
223	23	36	50	88	132	162	170	-	-
N223B	-	-	-	-	-	-	285	375	-
N223F	-	-	-	-	-	-	-	210	-
127W	-	-	-	-	-	-	-	250	300

For Additional Information, send for F-U5.

Series 25AUB

Bronze Body Water Pressure Regulator

For supply water pressures up to 300 lbs. and can be adjusted from 25 to 75 lbs. The standard setting is 50 lbs. The by-pass feature incorporated into these valves accurately controls build-up of system pressure and thermal expansion by equalizing the system and supply pressure when relief setting is in excess of available supply main pressure. NPT union inlet x female outlet. Max. temperature 160°F.

- Renewable stainless steel seat
- Stainless steel integral strainer
- High temperature resisting reinforced diaphragm for hot or cold water

OPTIONS 1/2" - 2" (Suffix):

- LP - Low pressure range 10-35 lbs. Set for 30 lbs. no flow pressure. Max. pressure 100 lbs., Max. Temp. 180°F.
- S - with sweat union inlet x NPT outlet
- G - with gauge tapping
- GG - with gauge tapping and D-160 lb. gauge
- SC - sealed spring cage for hi-rise applications
- DU - with threaded union inlet and outlet
- S-DU - Sweat union inlet and outlet
- HP - High pressure range 75-125 lbs. Set for 90 lbs. no flow pressure

Consult factory for:

- QT - Built-in 1/4-turn shut-off on threaded union inlet
- QT-S - Built-in 1/4-turn shut-off on solder union inlet

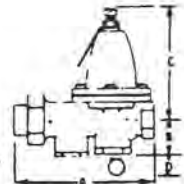
Sizes 1/2" - 1"

Z3 - for waterworks pit installations. Has sealed spring cage and stainless steel adjusting and cage screws. 1/2" - 1"

Z7 - for 400 lb. max. initial pressure 3/4" only



No. 25AUB-GG



No.	Size (Inches)	DIMENSIONS (Inches)				Weight (lbs.)
		A	B	C	D	
25AUB	1/2, 3/4	5 1/2	1 1/4	3 3/4	2 1/2	3 1/2
25AUB	1	6	2	4	2 1/2	6 1/2
25AUB	1 1/4	8 3/4	2 1/4	5 1/2	2 1/2	10
25AUB	1 1/2	9	2 1/4	5 1/2	2 1/2	10
25AUB	2	9 1/4	3 1/4	6 3/4	2 1/2	15

For Additional Information, send for ES-25.

No. N250, N250B

Iron Body Water Pressure Reducing Valves

NPT female inlet and outlet. Suitable for supply pressures up to 250 lbs. Adjustable reduced pressure range 25-75 lbs.

No. N250B with built-in by-pass feature.

Sizes 1/2" - 3/4"

No. N250 3/4" size only.



For Additional Information, send for S-N250.

No. 276H300

Water Pressure Test Gauge

Hose connection pressure gauge with high pressure indicator hand used for testing water supply pressure within a building.

3/4" hose thread connection. 0-300 PSI.



For Additional Information, send for ES-276H300.

BFP-1 BACKFLOW PREVENTER

BFP-1 BACKFLOW PREVENTER

WATTS W009SQTF 3/4 BRZ IPS BACKFLOW PREVENTER

Series 009QT

REDUCED PRESSURE ZONE BACKFLOW PREVENTER

Sizes: 1/2" - 2"

The Watts Series 009QT Reduced Pressure Zone Backflow Preventers are designed to provide protection of the potable water supply in accordance with national plumbing codes and water utility authority requirements. This series can be utilized in a variety of installations, including high hazard cross connections in piping systems or for containment at the service line entrance. This series features two in-line, independent check valves, captured springs and replaceable check seats with an intermediate relief valve. A compact modular design concept facilitates easy maintenance and assembly access. All sizes are constructed with NPT body connections and standardly furnished with ball type test cocks. Series 009QT has quarter turn, full port, resilient seated, bronze ball valve shut-offs. Sizes 1/2", 3/4" and 1" shutoffs have tee handles.

FEATURES

- Single access cover and modular check construction for ease of maintenance
- Top entry - all internals immediately accessible
- Captured springs for safe maintenance
- Internal relief valve for right and left hand installations
- Replaceable seats for economical repair
- Bronze body construction for durability
- Ball valve test cocks - screwdriver slotted
- Large body passages provides low pressure drop
- Compact, space saving design
- No special tools required for servicing

AVAILABLE MODELS

Sizes: 1/2" - 2"

Suffix:

QT - with quarter-turn, full port, resilient seated ball valve shutoffs

S - with bronze strainer

LF - without shutoffs

AQT - elbow fittings for 360° rotation

PC - with internal Polymer Coating

Prefix:

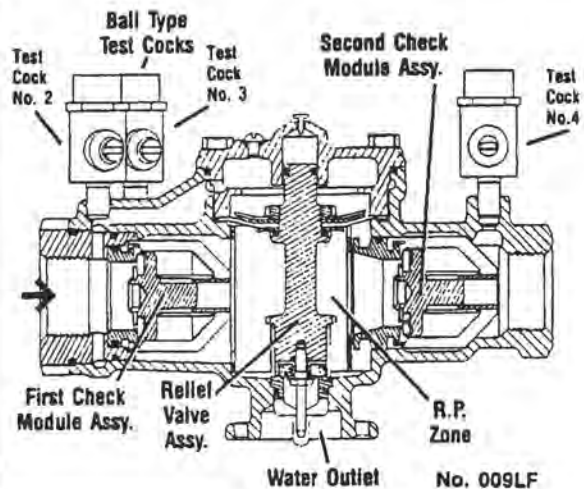
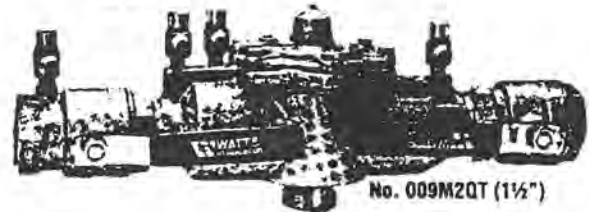
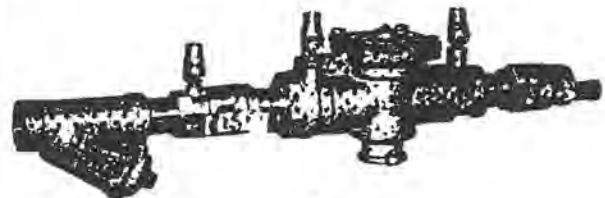
U - union connections (Send for ES-U009AQT for more information)

Note: The installation of a drain line is recommended. When installing a drain line, an air gap is necessary (see ES-AG).

SPECIFICATIONS

A reduced pressure zone backflow preventer shall be installed at each noted potential health hazard location to prevent backflow due to backsiphonage and/or backpressure. The assembly shall consist of an internal pressure differential relief valve located in a zone between two positive seating check modules with captured springs and silicone seat discs. Seats and seat discs shall be replaceable in both check modules and the relief valve. There shall be no threads or screws, in the waterway, exposed to line fluids. Service of all internal components shall be through a single access cover secured with stainless steel bolts. The assembly shall also include two resilient seated isolation valves, four resilient seated test cocks, a protective bronze wye strainer with a 20 mesh screen and an air gap drain fitting. The assembly shall meet the requirements of: USC Manual 8th Edition¹; ASSE Std. 1013; AWWA Std. C511; CSA B64.4; and shall be a Watts Regulator Co. Series 009QT.

[†] Does not indicate approval status. Refer to back page for approved sizes & models.



IMPORTANT: INQUIRE WITH GOVERNING AUTHORITIES FOR LOCAL INSTALLATION REQUIREMENTS.

A LEADER IN VALVE TECHNOLOGY

WATTS
REGULATOR

— Since 1874 —
Watts Industries, Inc. —
Water Products Division • Safety & Control Valves
815 Chestnut Street, North Andover, MA 01845-6098 USA
Tel. (508) 688-1811 Fax: (508) 794-1848
Watts Industries (Canada) Inc.
Tel. (905) 851-8591 Fax: (905) 851-8788
Watts Industries (Europe) BV
Watts Ocean BV Fax: +31-8338-54192
Fax: +31-8338-52073

MATERIALS

Bronze body construction, silicone rubber for drip tight disc material in the first and second check plus the relief valve. Replaceable polymer check seats for first and second checks. Removable stainless steel relief valve seat. Stainless steel cover bolts. Standardly furnished with NPT body connections. For optional bronze union inlet and outlet connections, specify prefix U (1/4" - 2"). Series 009QT furnished with quarter turn, full port, resilient seated, bronze ball valve shutoffs.

PRESSURE-TEMPERATURE

Series 009QT is suitable for supply pressure up to 175 PSI and water temperatures up to 140°F continuous and 180°F intermittent.

STANDARDS

USC Manual 8th Edition†
 ASSE No. 1013
 AWWA C511-89
 CSA B64.4
 IAPMO File No. 1563.

† Does not indicate approval status. See below for approved models.

APPROVALS

ASSE, AWWA, CSA, IAPMO

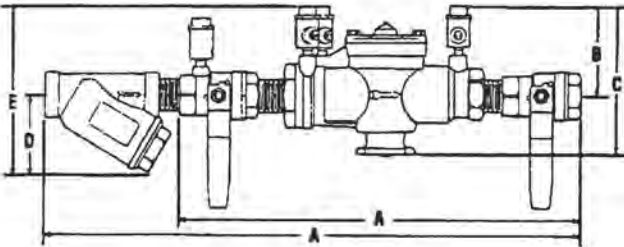
Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California. Approval models QT, AQT, PC, U.



IMPORTANT: Inquire with governing authorities for local installation requirements.

DIMENSIONS - WEIGHT

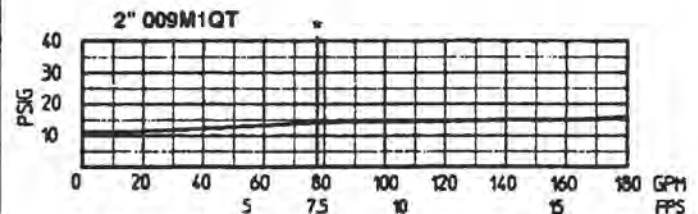
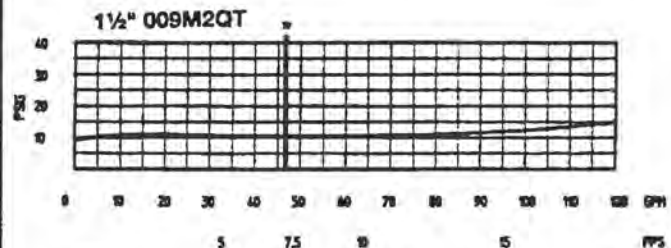
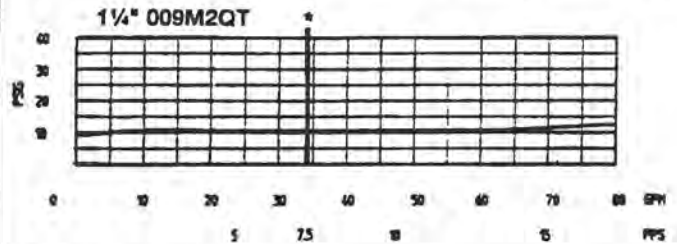
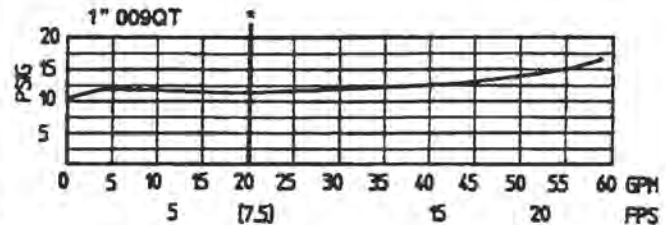
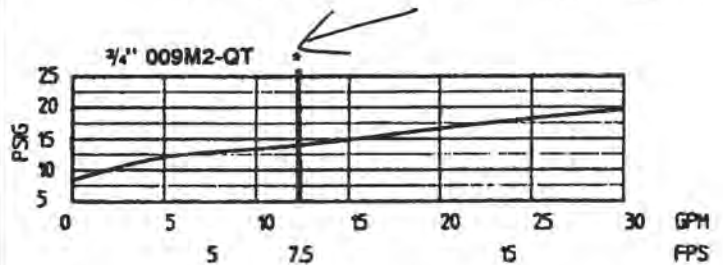
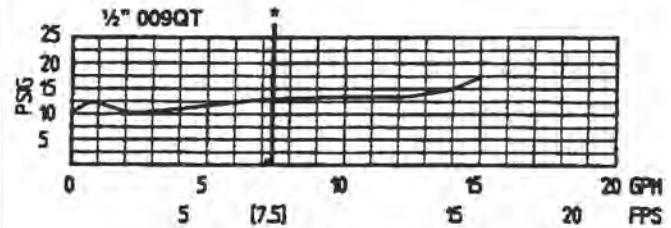
(Approximate)



Size	Series	Dimensions (Inches)					Width	Weight (Lbs.)
		A	B	C	D	E		
1/2"	009QT	10	2 7/16	4 1/2			5	4 1/2
	009QT-S	13	2 7/16	4 1/2	3	6	5	5 1/2
3/4"	009M2QT	11 3/4	3 3/4	5			6 1/4	5 3/4
	009M2QT-S	16 1/4	3 3/4	5	2 3/4	6 1/2	6 1/4	7 3/4
1"	009QT	16 3/4	3 3/8	5 1/2			8 1/4	12 1/4
	009QT-S	22 1/2	3 3/8	5 1/2	3 1/4	6 1/4	8 1/4	15 1/4
1 1/4"	009M2QT	17 23/64	3 3/8	5 8/16			12 1/2	14 3/4
	009M2QT-S	23 1/4	3 3/8	5 8/16	3 3/4	7 49/64	12 1/2	20 3/16
1 1/2"	009M2QT	17 27/32	3 3/8	5 8/16			12 1/2	16 1/16
	009M2QT-S	24 1/2	3 3/8	5 8/16	3 3/4	7 3/8	12 1/2	20 1/2
2"	009M1QT	21 3/8	4 1/4	7 1/4			12 1/2	29 15/16
	009M1QT-S	29 3/8	4 1/4	7 3/4	4	8 1/4	12 1/2	36 3/4

CAPACITY

Performance as established by an independent testing laboratory.



*Typical maximum system flow rate (7.5 feet/sec.)



Ken Haynes
Sales Engineer

GE Industrial Systems

12101 Woodcrest Executive Dr.
St. Louis, MO 63141
Ph: 314-579-7113 Fx: 314-579-7130

McKnight Road
Church of Christ

Submittals for Approval
12/17/02

Eckelkamp Electric



12101 Woodcrest Executive Dr.
St. Louis, MO 63141
Email: ken.haynes@indsys.ge.com

Date : 6/19/2003 V 6.50
Telephone : 314-579-7113
Fax : 314-579-7130

Bill of Material
MCKNIGHT ROAD CHURCH

Proposal # : 6K4-12021W
Base Bid

Item# Qty Description

- 1 1 Spectra Bolt-On Panel (101)
MSDP
Single Section Panel Bottom Feed Surface Mnt SE Label
3P4W 208Y/120V, 65 KAIC
1200A Main Lugs
3 200A 3 Pole SFHA
1 200A 3 Pole SFHA Space
1 600A 3 Pole SGHA6
1 400A 3 Pole SGDA4
1 Copper Bus Heat Rated
1 Narrow Box 31"
1 Nameplates
1 47 Ckt bonded grd AEG47
1 APB3175 Box
1 APF7523EC Front
1 APNB2312FH2B Interior

- 2 1 Spectra Bolt-On Panel (101)
PANEL PDP
Single Section Panel Top Feed Surface Mnt
3P4W 208Y/120V 65 KAIC
600A Main Lugs
1 200A 3 Pole SFHA
2 100A 3 Pole TEY
3 60A 3 Pole TEY
3 30A 3 Pole TEY
1 Copper Bus Heat Rated
1 Nameplates
1 CU Grnd bonded AEGCU47
1 APB2765BS Box
1 APFT6523SFP Front
1 APNB2306FH2B Interior

Item# Qty Description

3 1 Panelboard, Type AQ (101)
PANEL KP

Sec-1

Section 1 of 2 Top Feed Surface Mnt 30 Ckts
3P4W 208Y/120V 10 KAIC
~~225A 3 Pole THQB Main~~ *Main Lugs only*
1 70A 2 Pole THQB
1 Shunt Trip
1 50A 2 Pole THQB
1 40A 2 Pole THQB
1 Shunt Trip
1 30A 2 Pole THQB
1 45A 1 Pole THQB
1 20A 1 Pole THQB
1 Shunt Trip
17 20A 1 Pole THQB
1 Feed Thru Lugs
1 Copper Bus Heat Rated
1 Concealed Hinges & Trim
1 Nameplates
1 Same Box Size
2 Ground main lug TGL20
3 Ground-Cu box bonded TGC2
1 AB43B Box
1 AF43SN Front
1 AQF3302ATX Interior AXT1B7

Sec-2

Section 2 of 2 Top Feed Surface Mnt 30 Ckts
3P4W 208Y/120V 10 KAIC
225A Main Lugs
25 20A 1 Pole THQB
5 20A 1 Pole THQB Space
1 Copper Bus Heat Rated
1 Concealed Hinges & Trim
1 Nameplates
1 Same Box Size
1 Ground main lug TGL20
3 Ground-Cu box bonded TGC2
1 AB43B Box
1 AF43SN Front
1 AQF3302MTX Interior AXB7P1

Item# Qty Description

- 4 1 Panelboard, Type AQ (101)
PANEL LP

Sec-1

Section 1 of 2 Top Feed Surface Mnt 30 Ckts
3P4W 208Y/120V 10 KAIC
~~225A 3 Pole TGD Main~~ *Main Lugs only*
2 30A 3 Pole THQB
1 20A 2 Pole THQB
22 20A 1 Pole THQB
1 Feed Thru Lugs
1 Copper Bus Heat Rated
1 Concealed Hinges & Trim
1 Nameplates
1 Same Box Size
2 Ground main lug TGL20
3 Ground-Cu box bonded TGC2
1 AB43B Box
1 AF43SN Front
1 AQF3302ATX Interior AXT1B7

Sec-2

Section 2 of 2 Top Feed Surface Mnt 30 Ckts
3P4W 208Y/120V 10 KAIC
225A Main Lugs
30 20A 1 Pole THQB
1 Copper Bus Heat Rated
1 Concealed Hinges & Trim
1 Nameplates
1 Same Box Size
1 Ground main lug TGL20
3 Ground-Cu box bonded TGC2
1 AB43B Box
1 AF43SN Front
1 AQF3302MTX Interior AXB7P1

- 5 3 Safety Switch 131
RTU-1,2,6
THN3362R
For use with size 12-2 Copper or size 12-2 Aluminum wire
Heavy Duty 60 Amp No Fuse 3 pole 3 wire 240V NEMA 3R
(Outdoor)
- 6 1 Safety Switch 131
RTU-3
THN3364R
For use with size 2-250 Copper or size 2-250 Aluminum wire
Heavy Duty 200 Amp No Fuse 3 pole 3 wire 240V NEMA 3R
(Outdoor)
- 7 1 Safety Switch 131
RTU-4
THN3363R
For use with size 10-1/0 Copper or size 10-1/0 Aluminum wire
Heavy Duty 100 Amp No Fuse 3 pole 3 wire 240V NEMA 3R
(Outdoor)

Name : MCKNIGHT ROAD CHURCH
Prop : 6K4-12021W

Date : 12/17/2002
Page : 4

Item# Qty Description

8 3 Safety Switch 131
RTU-5,7,8
THN3361R
For use with size 14-8 Copper or size 12-8 Aluminum wire
Heavy Duty 30 Amp No Fuse 3 pole 3 wire 240V NEMA 3R
(Outdoor)

Ken Haynes



Spectra Panelboard

Item 1 MSDP

Panel Description

GE Type SBO Panelboard
 Qty 1
 1200 Amp, 208Y/120V
 3P4W
 65 KAIC SC Fully Rated
 Copper Bus
 Nema 1 Enclosure
 Surface Mounted
 Bottom Feed

Main Description

Amps: 1200 Amp
 Type: Main Lugs
 Lugs: 1-lug/ph 4-cable/lug
 2/0 -600 mcm

Options

- 1 - Copper Bus Heat Rated
- 1 - Narrow Box 31"
- 1 - Nameplates
- 1 - 47 Ckt bonded grd AEG47

Branch Devices

Qty	Amps/P	Cat#
3	200A/3P	SFHA36AT0250+
3	Rating Plg	SRPF250A200
3	Lug Kit	3TCAL29
1	200A/3P	Spaces
1	600A/3P	SGHA36AT0600+
1	Rating Plg	SRPG600A600
1	Lug Kit	1TCLK365
1	400A/3P	SGDA32AT0400+
1	Rating Plg	SRPG400A400
1	Lug Kit	1TCLK365

Remarks

Suitable for service entrance

Panel Interior

5 X FILLER					
Ckt	Type	Amps/P	Type	Amps/P	Ckt
1	SFHA	200/3	SPACE	200/3	2
	MAIN	-	MAIN (future)	-	
	-	-	-	-	
3	SFHA	200/3	SFHA	200/3	4
	MAIN	-	MAIN	-	
	-	-	-	-	
5	SGHA6	600/3	CENTER MTD	-	
	MAIN	-	-	-	
	-	-	-	-	
	-	-	-	-	
6	SGDA4	400/3	-	-	
	MAIN	-	-	-	
	-	-	-	-	
	-	-	-	-	
1200A 3P					
LUGS					

* Drawing not to scale

Job Name:	MCKNIGHT ROAD CHURCH		
Prop No:	6K4-12021W	GE Req#:	
PO#:			
Marks:	MSDP	Dated:	06/19/2003

1A Interior	APNB2312FH2B
1B Box	APB3175
1C Front	APF7523EC
Dimensions	75.5"H x 31"W x 11.5"D



Spectra Panelboard

Item 2 PANEL PDP

Panel Description

GE Type SBO Panelboard
 Qty 1
 600 Amp, 208Y/120V
 3P4W
 65 KAIC SC Fully Rated
 Copper Bus
 Nema 1 Enclosure
 Surface Mounted
 Top Feed

Main Description

Amps: 600 Amp
 Type: Main Lugs
 Lugs: 1-lug/ph 2-cable/lug
 2/0 -500 mcm

Options

- 1 - Copper Bus Heat Rated
- 1 - Nameplates
- 1 - CU Gmd bonded AEGCU47

Branch Devices

Qty	Amps/P	Cat#
1	200A/3P	SFHA36AT0250+
1	Rating Plg	SRPF250A200
1	Lug Kit	3TCAL29
2	100A/3P	TEY3100
3	60A/3P	TEY360
3	30A/3P	TEY330

Panel Interior

600A 3P LUGS					
Ckt	Type	Amps/P	Type	Amps/P	Ckt
1	SFHA	200/3	CENTER MTD	-	
-	-	-	-	-	
2	TEY	100/3	TEY	100/3	3
-	-	-	-	-	
4	TEY	60/3 40/3	TEY	60/3 40/3	5
-	-	-	-	-	
6	TEY	60/3 40/3	TEY	30/3	7
-	-	-	-	-	
8	TEY	30/3	TEY	30/3	9
-	-	-	-	-	
-	-	-	-	-	
4 X FILLER					

* Drawing not to scale

Job Name:	MCKNIGHT ROAD CHURCH		
Prop No:	6K4-12021W	GE Req#:	
PO#:			
Marks:	PANEL PDP	Dated:	06/19/2003

2A Interior	APNB2306FH2B
2B Box	APB2765BS
2C Front	APFT6523SFP
Dimensions	64.63"H x 27"W x 11.5"D



A Series Panelboard

Item 3

PANEL KP

Panel Description

GE Type AQ Panelboard
 Qty 1
 225 Amp, 208Y/120V
 3P4W, Section 1 of 2
 10 KAIC SC Fully Rated
 Copper Bus
 Nema 1 Enclosure
 Surface Mounted
 Top Feed

Main Description

Amps: 225 Amp
 Poles: 3 Pole
 Type: Main Breaker
 Cat No.: TQD32225
 Acc:
 Lugs: 1-lug/ph 1-cable/lug
 #1 -300 mcm

Options

- 1 - Feed Thru Lugs
- 1 - Copper Bus Heat Rated
- 1 - Concealed Hinges & Trim
- 1 - Nameplates
- 1 - Same Box Size
- 2 - Ground main lug TGL20
- 3 - Ground-Cu box bonded TGC2

Branch Devices

Qty	Amps/P	Cat#
1	70A/2P	THQB2170+
1	Shunt Trip	TQST1
1	50A/2P	THQB2150
1	40A/2P	THQB2140+
1	Shunt Trip	TQST1
1	30A/2P	THQB2130
1	45A/1P	THQB1145
1	20A/1P	THQB1120ST1
1	Shunt Trip	
17	20A/1P	THQB1120

Panel Interior

225A FEED THRU LUGS WITH NEUTRAL					
225A 3P TQD (no main) MAIN 225A. Main Lug Only					
Ckt	Type	Amps/P	Type	Amps/P	Ckt
1	THQB	70/2	THQB	50/2	2
	SHUNT TRIP	-	-	-	
	-	-	THQB	40/2	3
4	THQB	30/2	SHUNT TRIP	-	
	-	-	-	-	
5	THQB	45/1	THQB	20/1	6
7	THQB	20/1	SHUNT TRIP	-	
8	THQB	20/1	THQB	20/1	9
10	THQB	20/1	THQB	20/1	11
12	THQB	20/1	THQB	20/1	13
14	THQB	20/1	THQB	20/1	15
16	THQB	20/1	THQB	20/1	17
18	THQB	20/1	THQB	20/1	19
20	THQB	20/1	THQB	20/1	21
22	THQB	20/1	THQB	20/1	23
225A PANEL END FILLER					

* Drawing not to scale

Job Name:	MCKNIGHT ROAD CHURCH		
Prop No:	6K4-12021W	GE Req#:	
PO#:			
Marks:	PANEL KP	Dated:	12/17/2002

3-1A Interior	AQF3302ATX AXT1B7
3-1B Box	AB43B
3-1C Front	AF43SN
Dimensions	43.5"H x 20"W x 5.75"D



A Series Panelboard

Item 3 PANEL KP

Panel Description

GE Type AQ Panelboard
 Qty 1
 225 Amp, 208Y/120V
 3P4W, Section 2 of 2
 10 KAIC SC Fully Rated
 Copper Bus
 Nema 1 Enclosure
 Surface Mounted
 Top Feed

Main Description

Amps: 225 Amp
 Type: Main Lugs
 Lugs: 1-lug/ph 1-cable/lug
 #6 -350 mcm

Options

- 1 - Copper Bus Heat Rated
- 1 - Concealed Hinges & Trim
- 1 - Nameplates
- 1 - Same Box Size
- 1 - Ground main lug TGL20
- 3 - Ground-Cu box bonded TGC2

Branch Devices

Qty	Amps/P	Cat#
25	20A/1P	THQB1120
5	20A/1P	Spaces

Panel Interior

225A MAIN LUGS WITH NEUTRAL					
Ckt	Type	Amps/P	Type	Amps/P	Ckt
1	THQB	20/1	THQB	20/1	2
3	THQB	20/1	THQB	20/1	4
5	THQB	20/1	THQB	20/1	6
7	THQB	20/1	THQB	20/1	8
9	THQB	20/1	THQB	20/1	10
11	THQB	20/1	THQB	20/1	12
13	THQB	20/1	THQB	20/1	14
15	THQB	20/1	THQB	20/1	16
17	THQB	20/1	THQB	20/1	18
19	THQB	20/1	THQB	20/1	20
21	THQB	20/1	THQB	20/1	22
23	THQB	20/1	THQB	20/1	24
25	THQB	20/1	SPACE	20/1	26
27	SPACE	20/1	SPACE	20/1	28
29	SPACE	20/1	SPACE	20/1	30
225A PANEL END FILLER					

* Drawing not to scale

Job Name:	MCKNIGHT ROAD CHURCH		
Prop No:	6K4-12021W	GE Req#:	
PO#:			
Marks:	PANEL KP	Dated:	12/17/2002

3-2A Interior	AQF3302MTX AXB7P1
3-2B Box	AB43B
3-2C Front	AF43SN
Dimensions	43.5"H x 20"W x 5.75"D



A Series Panelboard

Item 4 PANEL LP

Panel Description

GE Type AQ Panelboard
 Qty 1
 225 Amp, 208Y/120V
 3P4W, Section 1 of 2
 10 KAIC SC Fully Rated
 Copper Bus
 Nema 1 Enclosure
 Surface Mounted
 Top Feed

Main Description

Amps: 225 Amp
 Poles: 3 Pole
 Type: Main Breaker
 Cat No.: TQD32225
 Acc:
 Lugs: 1-lug/ph 1-cable/lug
 #1 -300 mcm

Options

- 1 - Feed Thru Lugs
- 1 - Copper Bus Heat Rated
- 1 - Concealed Hinges & Trim
- 1 - Nameplates
- 1 - Same Box Size
- 2 - Ground main lug TGL20
- 3 - Ground-Cu box bonded TGC2

Branch Devices

Qty	Amps/P	Cat#
2	30A/3P	THQB32030
1	20A/2P	THQB2120
22	20A/1P	THQB1120

Panel Interior

225A FEED THRU LUGS WITH NEUTRAL					
225A 3P TQD (No main) MAIN 225A. Main Lugs Only					
Ckt	Type	Amps/P	Type	Amps/P	Ckt
1	THQB	30/3	THQB	30/3	2
	-	-	-	-	
	-	-	-	-	
3	THQB	20/2	THQB	20/1	4
	-	-	THQB	20/1	5
6	THQB	20/1	THQB	20/1	7
8	THQB	20/1	THQB	20/1	9
10	THQB	20/1	THQB	20/1	11
12	THQB	20/1	THQB	20/1	13
14	THQB	20/1	THQB	20/1	15
16	THQB	20/1	THQB	20/1	17
18	THQB	20/1	THQB	20/1	19
20	THQB	20/1	THQB	20/1	21
22	THQB	20/1	THQB	20/1	23
24	THQB	20/1	THQB	20/1	25
225A PANEL END FILLER					

* Drawing not to scale

Job Name:	MCKNIGHT ROAD CHURCH		
Prop No:	6K4-12021W	GE Req#:	
PO#:			
Marks:	PANEL LP	Dated:	12/17/2002

4-1A Interior	AQF3302ATX AXT1B7
4-1B Box	AB43B
4-1C Front	AF43SN
Dimensions	43.5"H x 20"W x 5.75"D



A Series Panelboard

Item 4 PANEL LP

Panel Description

GE Type AQ Panelboard
 Qty 1
 225 Amp, 208Y/120V
 3P4W, Section 2 of 2
 10 KAIC SC Fully Rated
 Copper Bus
 Nema 1 Enclosure
 Surface Mounted
 Top Feed

Main Description

Amps: 225 Amp
 Type: Main Lugs
 Lugs: 1-lug/ph 1-cable/lug
 #6 -350 mcm

Options

- 1 - Copper Bus Heat Rated
- 1 - Concealed Hinges & Trim
- 1 - Nameplates
- 1 - Same Box Size
- 1 - Ground main lug TGL20
- 3 - Ground-Cu box bonded TGC2

Branch Devices

Qty	Amps/P	Cat#
30	20A/1P	THQB1120

Panel Interior

225A MAIN LUGS WITH NEUTRAL					
Ckt	Type	Amps/P	Type	Amps/P	Ckt
1	THQB	20/1	THQB	20/1	2
3	THQB	20/1	THQB	20/1	4
5	THQB	20/1	THQB	20/1	6
7	THQB	20/1	THQB	20/1	8
9	THQB	20/1	THQB	20/1	10
11	THQB	20/1	THQB	20/1	12
13	THQB	20/1	THQB	20/1	14
15	THQB	20/1	THQB	20/1	16
17	THQB	20/1	THQB	20/1	18
19	THQB	20/1	THQB	20/1	20
21	THQB	20/1	THQB	20/1	22
23	THQB	20/1	THQB	20/1	24
25	THQB	20/1	THQB	20/1	26
27	THQB	20/1	THQB	20/1	28
29	THQB	20/1	THQB	20/1	30
225A PANEL END FILLER					

* Drawing not to scale

Job Name:	MCKNIGHT ROAD CHURCH		
Prop No:	6K4-12021W	GE Req#:	
PO#:			
Marks:	PANEL LP	Dated:	12/17/2002

4-2A Interior	AQF3302MTX AXB7P1
4-2B Box	AB43B
4-2C Front	AF43SN
Dimensions	43.5"H x 20"W x 5.75"D

**TYPICAL
TYPE AL, AQ PANELBOARD
(REPLACES TYPES NLTQ, NLAB)**

INTERRUPTING RATINGS—MOLDED CASE CIRCUIT BREAKERS

Molded Case Circuit Breakers						Federal Specs C/B Class W-C-375B	UL Listed Interrupting Ratings in Thousand Amps				
Construction	Frame	Trip Range (Amps)	Pole	Rated Volts			RMS Symmetrical ac Volts				
				ac	dc		120	120/240	240	277	480Y/277
HQ Frames	THQB THQL	15-70	1	120/240		12a	10	10			
		15-125	2	120/240		12a		10			
		15-100	2, 3	240		12b			10		
HHQ Frames	THHQL THHQB	15-70	1	120/240		14a	22	22			
		15-125	2	120/240		14a		22			
		15-100	2, 3	240		14b			22		
XQ Frames	TXQB	15-30	1, 2	120/240		15a			65		
		15-30	3	240		15b			65		
Standard Frames	TEY	15-100	1	480Y/277	250	13a			65	14	
		15-100	2, 3	480Y/277	250	13b			85		14
	TQD	125-225	2, 3	240		12b			10		
	TJD	250-400	2, 3	240	250 ①	14b			22		
Hi-Break [®] Frames	THQD	125-225	2, 3	240		N/A			22		
Hi-Interrupting Circuit Breakers	TLB1	15-150	3	480					85	50	
	TLB2	125-225	3	480					85	50	
	TLB4	225-400	3	480					85	50	
Current Limiting Circuit Breakers	THLC1	15-150	3	480					200	150	
	THLC2	125-225	3	480					200	150	
	THLC4	225-400	3	480					200	150	

① 3-pole devices are not DC rated

PANELBOARD SHORT-CIRCUIT RATING:

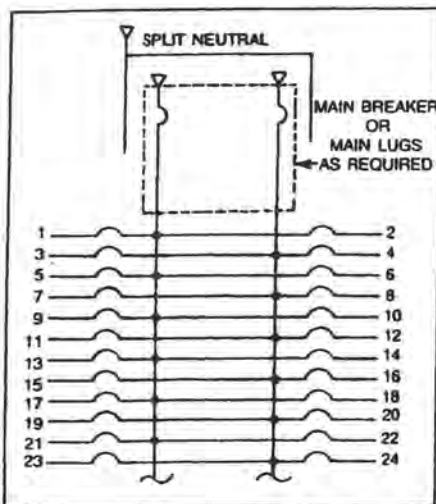
The short-circuit rating of a panelboard is limited to the interrupting rating of the lowest rated device or to the applicable UL listed series rating when proper main and branch device combinations are used. The short-circuit current available at the incoming line terminals should not exceed this value.

When a panelboard is applied within its short-circuit rating, bus bar bracing is adequate to withstand the forces exerted by the let-through current.

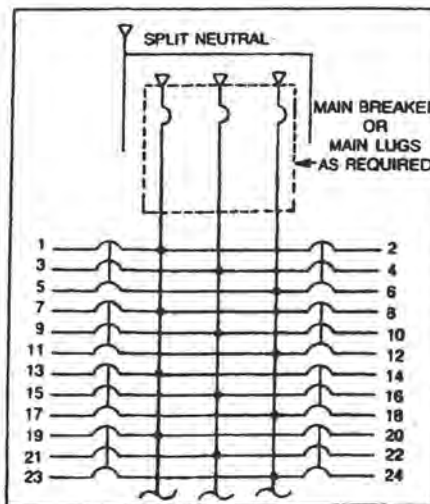
MOLDED CASE CIRCUIT BREAKERS

Circuit Breaker				Terminal Lugs (Cu-Al)						
Frame				Poles	No. Per Pole	Cat. No.	Wire—Cu-Al (Unless otherwise noted)			
Standard	Hi-Break [®]	Current Limiting	High Interrupting				Per Lug	Range		
THQL	TXQL, THHQL			1	1	Fixed to Breaker Terminal	1	(15-30A) #14-10 CU or #12-8 AL (35-60A) #14-4 CU or #12-3 AL (70-100) #6-1 CU, #4-1/0 AL		
THQL	TXQL, THHQL			2-3						
THQB	TXQB, THHQB			1, 2, 3						
TEY				1, 2, 3	1		1	(15-20A) #14-#12 CU, #10-#12 AL (30-60A) #10-#8 CU, #8-#4 AL (70-100A) #4-#1 CU, #2-1/0 AL		
TED4				2-3	1	TCAL12A	1	(70-110A) #6-2/0 CU, #4-2/0 AL		
TQD	THQD			2-3	1	TCAL25	1	#1-300MCM		
TJD				2-3	1	TCAL43	1	#6-600MCM or 2-(2/0-250MCM)		
		THLC1	TLB1	3	1	TCAL12 TCAL12A TCAL15	1	(15-60A, TCAL12) #14-#3 CU or #12-#1 AL (70-110A, TCAL12A) #6-2/0 CU or #4-2/0 AL (125-150A, TCAL15) #1-2/0 CU or 1/0-3/0 AL		
		THLC2	TLB2	3	1	TCAL27	1	(125-225A, TCAL27) #4-300MCM		
		THLC4	TLB4	3	1	TCLK43①		3/0-500MCM or 2 (3/0-250MCM)		

① Three-pole lug assembly suitable for line or load end



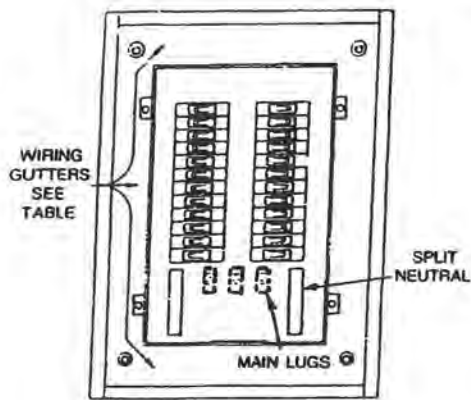
30 3W 240/120 VAC



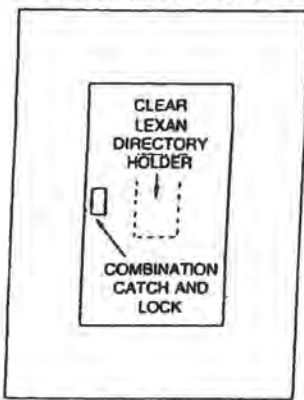
- 30 4W 208Y/120 VAC
- ② 30 4W 240/120 VAC Mid Tap Delta
- 30 3W 240 VAC Ungrounded Delta (Do not connect neutral)
- ③ 1 pole devices cannot be connected to B6
- 2 pole devices connected to B6 must be 240V rated

Neutral may be plate type and/or located opposite line entrance depending on main breaker type, rating and specified panel options

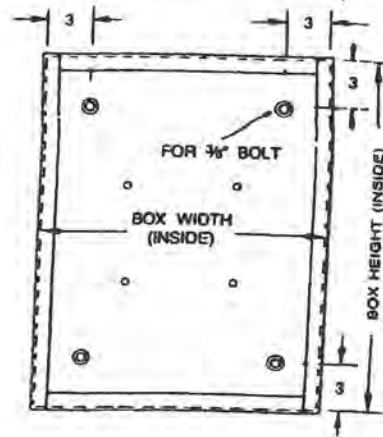
HINGES AND TRIM ADJUSTING SCREWS



Front View with trim removed



Surface mounting — add 1/4" to inside box dimensions
Flush mounting — add 1 1/2" to inside box dimensions



MINIMUM WIRING SPACE—FROM END OF LUG TO WALL OF BOX IN INCHES

Main Rating/ In Amperes	Main Lugs Only		Main Circuit Breaker				
	To End Wall		Frame Type	Mounting	Phase Lug		Neutral Lug
	Phase Lug	Neutral Lug			To Side Wall (20" Wide Box)	To End Wall	
125A Main Lug 100A Main Bkr	6	6	THOB, THHOB	Horizontal	6 1/2	6	6
			TEY	Horizontal	5		
			TEL THLC1	Vertical			
225	12	12	TQD, THQD	Horiz	5 1/2	12	12
			TLB2, THLC2	Vert			
400	15	11⊙	TJD TLB4 THLC4	Vert		15	11⊙
600	15	11⊙					

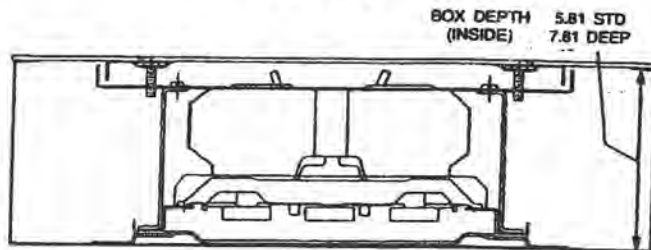
⊙To Side Wall

WIRING SPACE—BRANCH CIRCUIT BREAKERS

Branch Circuit Devices	Frame	No. of Poles	Wiring Space to Side Wall
			20" W Box
Q-Line Breakers (Double-branch Mounting)	THQL, THQL, TXQL, TXQB, THQB, THQCB	⊙	6 1/2"
Sub-feed Breakers Single Branch Mounting (6 poles max)	TQD, THQD	2, 3	5 1/2"

⊙See "Q" Line Breaker Trip Range in ampere table on back page

END VIEW



SPECIFICATIONS

General

- A-Series panelboards and branch breakers meet or exceed the following standards and specifications:
 - UL50, cabinets & boxes —NEMA PB-1, panelboards
 - UL67, panelboards —US Federal Spec. W-P-115b Panelboards
 - UL489, circuit breaker —US Federal Spec. W-C375b Gen circuit breakers
 - NEMA AB-1, circuit breakers
- Metal gages in accordance with U/I and NEMA standards.
- Panelboards are of dead front construction.

Boxes

- Boxes are of galvalneal G20 steel.
- Endwalls furnished with Blank endwalls
- Boxes furnished with provisions for ground bus as standard.

Fronts

- Fronts finished in ANSI-61 grey polyester powder coat paint.
- Fronts equipped with corrosion resistant Valox® combination catch and lock door latch.
- Doors over 48 inches high provided with 2 latches.
- Fronts equipped with concealed hinges and trim adjusting screws.
- Directory holder of clear, impact resistant Lexan® permanently mounted to door.

Panels

- Panelboard interiors are factory assembled on rigid steel frames.
- Solderless, anti-turn main lugs suitable for copper or aluminum wire are front removable and branch straps will be silver plated copper fully rated at 100 amperes.
- Main bus will be aluminum with copper branch connections unless otherwise specified.
- Main disconnect device is identified when supplied, and numbers are provided for branch circuits.
- Interior base assemblies will be of Noryl® and provide breaker mounting and bus bar insulation.
- Unless otherwise specified, branch circuits will be arranged as follows:
 - 3 pole devices and specified spaces will be placed closest to the main in descending order of ampere rating. The higher rated device will be on the right.
 - 2 pole devices are mounted next, also in descending order of ampacity, followed by the 1 pole devices.
 - Unidentified spaces will be installed at the end opposite the main.
 - Double branched devices will have a total combined ampacity of 180 amperes.



Spec - Setter Safety Switches

Type TH Switches, Heavy Duty

30-1200 Amperes
240 Volts ac, 250 Volts dc Max.
480/600 Volts ac, 250 Volts dc
600 Volts dc

Type TH Interrupting and
Withstandability Ratings

Designed for applications where safety, high performance and continuity of service are essential.

- *CSA Certified
- *UL Listed, (Enclosed Switches No.98)
- *60°C and 75°C conductor ratings
- *Quick-make, quick-break mechanisms
- *Full cover interlocks

UL Listed Ratings for fusible switches when used with these fuses:

- *Class J (200,000 rms amps, sym IC)
- *Class R(200,000 rms amps, sym IC)

- *Meet Federal Specification WS-865C for heavy duty switches
- *Meet major automotive manufacturer's and JIC electrical specifications
- *Meet NEMA Enclosed Safety Switch Standard KS1-1983 for Type HD>
- *Suitable for use as service entrance installed in accordance with the national electrical code.

- *Class H (100,000 rms amps, sym IC) Standard on 30-600amps
- *Class L (100,000 rms amps, sym IC) Standard on 800-1200amps

Type TG Switches, General Duty

30-600 Amperes
240 Volts ac, 250 Volts dc Max.
Cartridge Fuse, Type TG Switches

- *CSA Certified
- *UL Listed (Enclosed Switch No.98)
- *60°C and 75°C conductor rating
- *Quick-make, quick-break mechanisms(30-200 amps)

- *Suitable for use as service entrance when installed in accordance with national electric code.
- *Designed for residential or light commercial application where duty is not severe
- *Meet or exceed NEMA enclosed switch standard KS1-1983 for type GD.
- *30-200 amp fusible switches are rated 100,000rms amps, sym IC when used with Class R fuses.

6 Pole Switches

- *UL Listed (Enclosed Switches No. 98)
- *Drip hood included
- *Horsepower rated
- *Quick-make, quick-break
- *Full cover interlocks

- *Furnished without knockouts or hubs. Order hubs separately
- *Single enclosure rated Type 1, 3R and 12
- *Equipment ground provided
- *Suitable for four-pole applications
- *60°C and 75°C conductor ratings

Type TC Indoor Double-throw Switches

- *Designed for application where safety, high performance, and continuity of service are essential
- *UL Listed (Enclosed Switches No.98). Suitable for use in accordance with Article 702 of the National Electrical Code.
- *Meet Federal Specification W-S-865C for enclosed switches; 30-200 amps, Type HD; 400-600 amps, Type LD
- *Meet or exceed NEMA Enclosed Switch Standard KS1-1983 for Type HD 30-200 amps, Type GD 400-600 amps.
- *60°C and 75°C conductor ratings.
- *Quick-make, quick-break mechanisms 30-200 maps; quick break mechanisms 400-600 amps

Dimensions—Knockouts

Sym- bol	A	B	C	D	E	F	G	H	J	K	L	M	N
Conduit Size (Inches)	3/32	1/2	1/2	1/2	1/2	1/2	3/4	3/4	1	1	2	2	2 1/2
	---	---	3/4	3/4	3/4	3/4	1	1	1 1/4	1 1/2	2 1/2	2 1/2	3
	---	---	---	1	1	1	---	1 1/4	1 1/2	2	3	3	---
	---	---	---	---	1 1/4	1 1/2	---	1 1/2	2	2 1/2	---	3 1/2	---



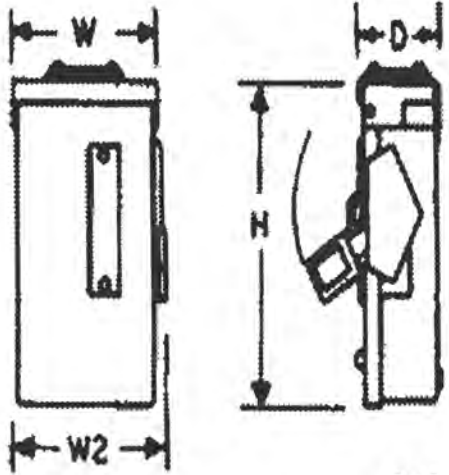
Data Sheet

Spec - Setter Safety Switches

Item	Qty	Catalog #	Description	Horsepower Rating												Dimensions (in inches)			Lay Out #	Knock Out #
				240 Volts AC				480 Volts AC				600 Volts AC								
				NEC		Time		NEC		Time		NEC		Time		W	H	D		
				1-Ph	3-Ph	1-Ph	3-Ph	1-Ph	3-Ph	1-Ph	3-Ph	1-Ph	3-Ph	1-Ph	3-Ph					
5	3	THN3362R	Heavy Duty 60 Amp No Fuse 3 pole 3 wire 240V NEMA 3R (Outdoor)	10	20	---	---	---	50	---	---	---	---	---	60	9.875	17.5	5	14L	22K
6	1	THN3364R	Heavy Duty 200 Amp No Fuse 3 pole 3 wire 240V NEMA 3R (Outdoor)	30	60	---	---	---	125	---	---	---	---	---	150	14	31.5	5.3125	14L	23K
7	1	THN3363R	Heavy Duty 100 Amp No Fuse 3 pole 3 wire 240V NEMA 3R (Outdoor)	20	40	---	---	---	75	---	---	---	---	---	100	9.875	17.5	5	14L	22K
8	3	THN3361R	Heavy Duty 30 Amp No Fuse 3 pole 3 wire 240V NEMA 3R (Outdoor)	3	10	---	---	---	20	---	---	---	---	---	30	8.875	13.25	4	14L	20K



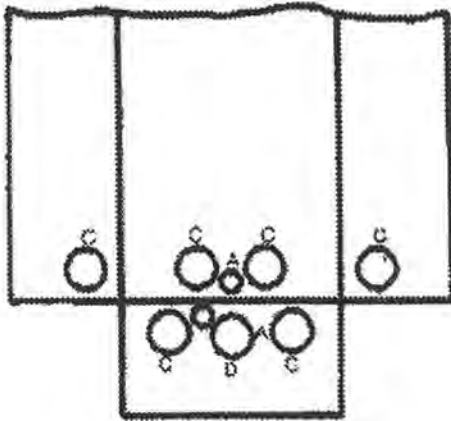
Layout Drawings



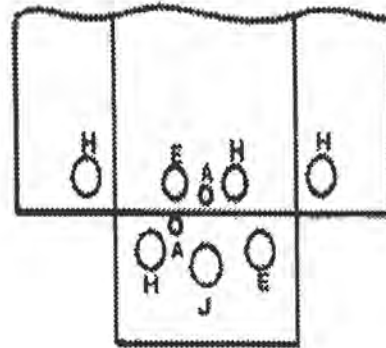
14L



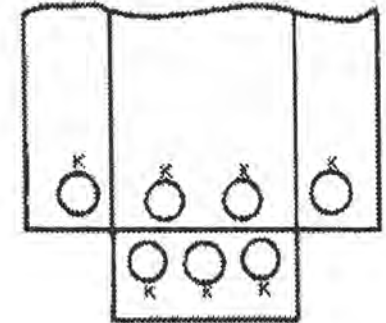
Knockout Drawings



20K



22K

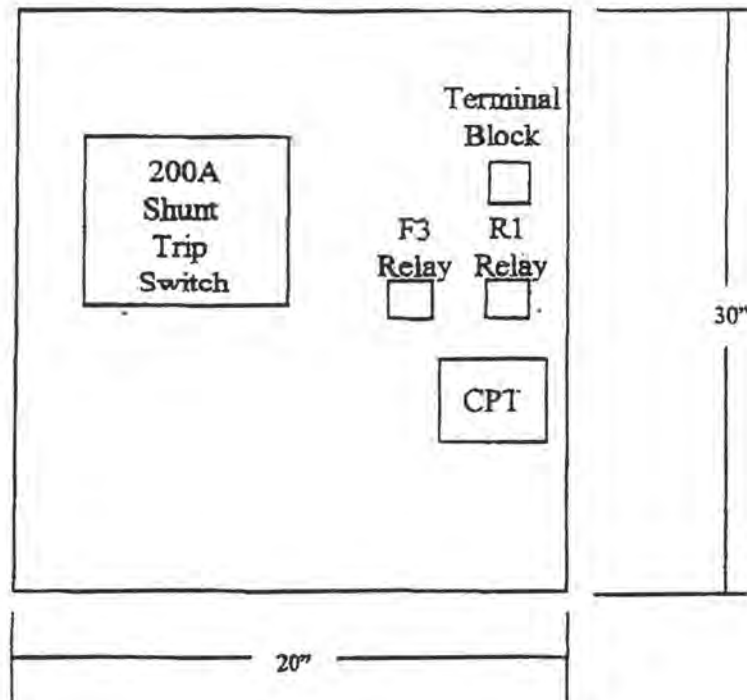


23K

Project Name: *MIDNIGHT ROAD CHURCH OF CHRIST*

Location: *ST. LOUIS, MO.*

Catalog Number: PS2T20R1KGAF3



Incoming Cable: Top Entrance
(1) #6 - 250 kcmil Al or Cu

Switch: PS2 - 200A Fusible Switch w/Shunt Trip (Class J Fuses not included w/unit)

CPT: T20 - 208 - 120V, 100VA w/Primary (2) & Secondary (1) Class CC Fuses

Relay: R1 - 3PDT, 10A, 120VAC, 2 NO/2NC Aux Contacts

Additional Accessories Included:

K - Key Test Switch

G - Green 'On' Pilot Light

A - Mechanically Interlocked Auxiliary Contact

F3 - Fire Alarm Voltage Monitoring Relay

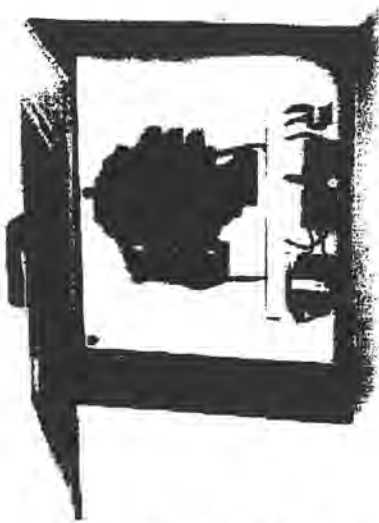
Terminal

Block: Wiring Terminal Block - 10P, Din Rail Mounted

Bussmann® Power Module™ Switch

PS

All-In-One Module



Bussmann® Power Module™ Switch

Standard Features:

- 30-400 amp 600 Vac 3p Fused Power Switch
- 200,000 amp RMS Short-Circuit Current Rating
- Shunt trip 120V
- Control power terminal block
- Ground lug per NEC
- Class J fuse mounting only¹

Optional Features:

- Control power transformer with fuses and blocks
- Fire safety interface relay
- Key to test switch
- Pilot light - "ON"
- Isolated neutral lug²
- Mechanically interlocked auxiliary contact for hydraulic elevators with battery backup (5 amp 120 Vac rated)
- Fire Alarm Voltage Monitoring Relay (To monitor Shunt Trip Voltage)
- NEMA 3R, 4, and 12 enclosures available³
- Phase failure and undervoltage relay available, consult factory
- For added protection, use the Bussmann SAMI fuse covers to improve maintenance personnel protection⁴ (OSHA 1910.333, paragraph C)

Agency Information:

U.L. 98 Enclosed and Dead Front Switch
 Guide 96NK3917, File E182262
 NEMA 1, U.L. 50, listed enclosure
 cU.L. per Canadian Standards C22.2, No. 0-M91-CAN/CSA
 C22.2, No. 4-MB9 Enclosed Switch

How to configure Part Numbers:

Step 1: Select Switch Amperage¹

Power Module™ Switch

Rating (Amps)	Power Module Switch Catalog No.
30	PS3
60	PS6
100	PS1
200	PS2
400	PS4

Step 2: Select Options Needed⁵

Optional Accessories¹

	Rating	Catalog Number
Option 1 Control Power Transformer (CPT) Std. 100VA with PRI & SEC Fuse (120V Secondary)	208V 240V 480V 600V	T20 T24 T48 T60
Option 2 Fire Safety Interface Relay (3PDT, 10-amp, 120V)	24 Vac Coil 120 Vac Coil	R2 R1
Option 3 Key to Test Switch	120V	K
Option 4 Pilot Light - "ON"	Red Green White	R G W
Option 5 Isolated Neutral Lug (Full Capacity) ²	30-60A 100A 200A 400A	N6 N1 N2 N4
Option 6 Mechanically interlocked auxiliary contact for hydraulic elevators with automatic recall (5 amp 120 Vac rated)	1 NO & 1 NC	A
Option 7 Fire Alarm Voltage Monitoring Relay (To monitor Shunt Trip Voltage)	Single-Pole Three-Pole	F1 F3
Option 8 Optional Enclosure	NEMA 3R NEMA 4 NEMA 12	U Y Z

Catalog No. Construction: Catalog number of PS Switch

Options as required in option order as listed above (i.e. option 1, 2, 3, etc.)

- Example:
- 100A S.T. Switch 480V-3P - PS1
 - 480-120V CPT - T48
 - 120 Vac Coil Fire Safety Interface Relay - R1
 - Pilot Light - "ON" (Green) - G
 - Mech. Interlock (1 NO & 1 NC) - A

Catalog Number PS1T48R1GA

¹Class J fuses not included.

²Overized 200% rated option available where required by excessive non-linear loads.

³Through 200A.

⁴Through 100A.

⁵Options 1, 2, & 6 are standard for elevator circuits.

Bussmann® Power Module™ Switch

All-In-One Module

PS

Bussmann® Power Module™ Switch - Dimensions and Lug Data

Catalog Number	Amp	NEMA 1 Dimensions ¹	Depth	NEMA 3R, 12 ²	Depth 3R, 12	Lug Size ³
PS3	30	20"H x 16"W	8 5/8"	20"H x 20"W	8"	#14 - #8 Al or Cu
PS6	60	20"H x 16"W	8 5/8"	20"H x 20"W	8"	#14 - #2 Al or Cu
PS1	100	20"H x 16"W	8 5/8"	20"H x 20"W	8"	#8 - 1/0 Al or Cu
PS2	200	30"H x 20"W	8 5/8"	30"H x 24"W	8"	#6 - 250 kcmil Al or Cu
PS4	400	55"H x 40"W	13"	—	—	(2) 3/0 - 500 kcmil Al or Cu

¹Standard over size enclosure to mount control power transformer fire safety interface relay and control terminal blocks.

²Contact factory for dimensions for NEMA 4 enclosure.

³Optional neutral lug size same as line and load.

Maximum Horsepower Rating of Switch - Sizing Based on Motor Type

Voltage	Amp Rating of Switch														
	30A PS3			60A PS6			100A PS1			200A PS2			400A PS4		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
208AC-3P	5	5	3	10	10	10	20	15	15	40	40	30	75	75	60
240AC-3P	5	5	5	10	10	10	20	20	15	50	40	30	125	75	75
480AC-3P	10	10	10	30	25	20	50	40	30	100	75	75	250	150	150
600AC-3P	15	15	10	30	30	25	60	50	40	125	100	100	250	200	200

Column Sizing Guidelines:

- A** Maximum horsepower rating of switch with Class J fuses, light-duty inrush
- B** Maximum horsepower rating of switch with Class J fuses, medium-duty inrush
- C** Maximum horsepower rating of switch with Class J fuses, heavy-duty or typical elevator cross line start

The above table can be used for estimating switch size for motor loads based upon the motor horsepower. Size the switch so that the Class J, time-delay fuses are used at a minimum of 150% of motor full load amps or next size up (for light starting duty applications, Column A). For general applications, excluding wound rotor and DC motors, NEC® 430-52 allows sizing at 175% of motor full load amps or the next standard size per NEC 240-6 (Column B). If sizing at 175% will not allow the motor to start, NEC 430-52 will allow the fuses to be sized up to 225% of motor full load amps or the next size down (Column C).

Note: In sizing the fuses, the motor FLA, is per Table 430-150, not per nameplate information.

Inrush currents of motors may vary, consult motor manufacturer data for correct sizing.

On elevator applications, motor load plus auxiliary loads need to be considered. Follow elevator manufacturer's recommendation for correct fuse sizing. For estimation purposes only, Column C can be used as a conservative approximation.

Standard Shunt Trip Ratings

Amp Rating	Voltage	Max Inrush	Max ¹ On-time	Momentary Inrush
30-100	120V, 60HZ	4 amps	1.5 cycles	140VA
200				
400				

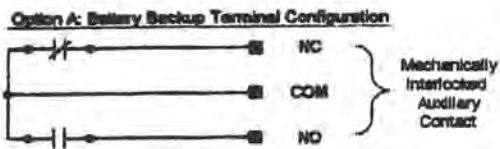
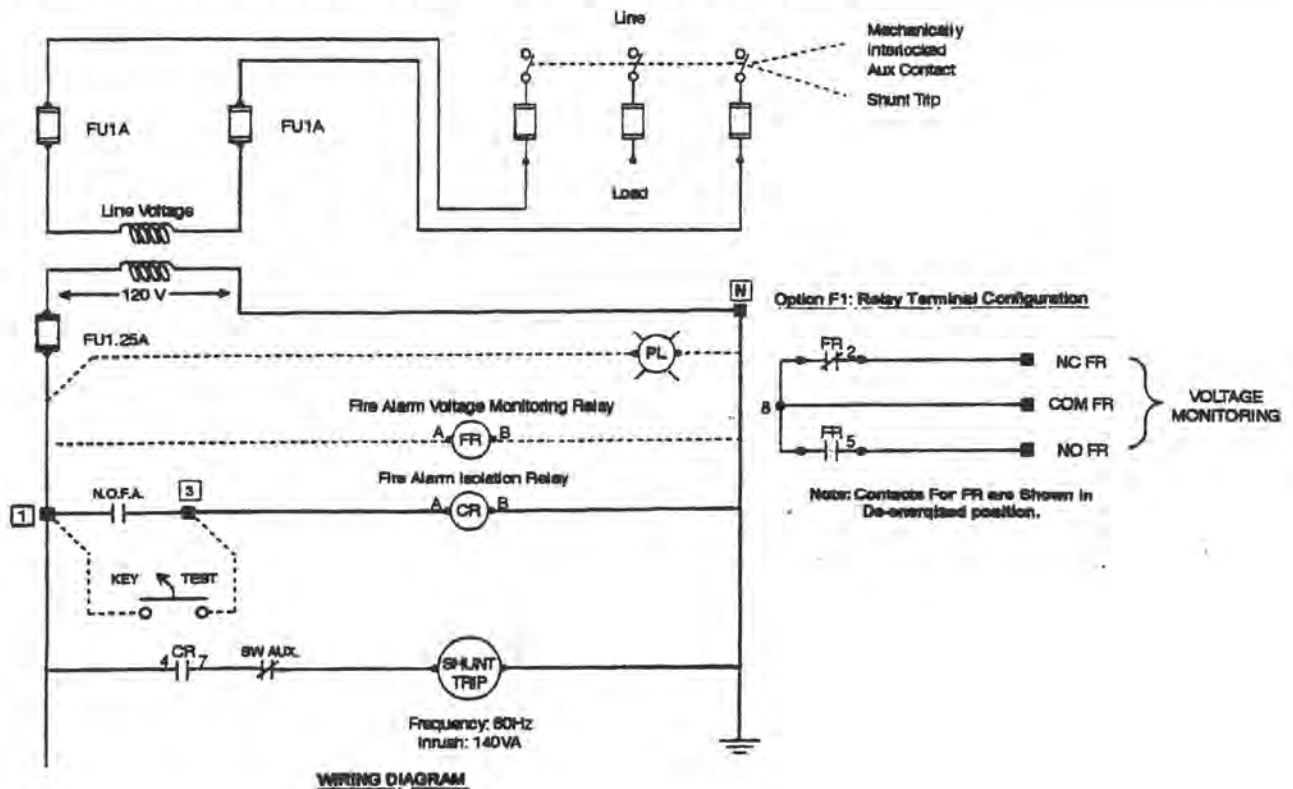
¹Will handle up to 447VA inrush.

Bussmann® Power Module™ Switch

All-In-One Module

PS

Typical Control with Wiring Options for Fire Safety Interface (Option R1)



To connect the battery lowering for hydraulic elevator, connect to Points NC and COM.

Note: Contacts For Mechanically Interlocked Auxiliary Contact are Shown in the Energized position.

Legend:

- N.O.F.A. - Normally Open Fire Alarm contacts supplied from the fire alarm system to initiate the shunt trip.
- Shunt Trip - Solenoid for remote trip of switch, which is activated by the closing of the fire alarm contacts or key test switch.
- Option R1 - Fire Safety Interface Relay that is operated at 120VAC from secondary of transformer. No additional power needed.
- CR - Control Relay used to isolate the N.O.F.A. contacts from the duty of the shunt trip.
- FR - Fire Alarm Voltage Monitoring Relay used to monitor presence of voltage in switch from a remote location (i.e. Fire Alarm Control Panel).
- PL - Pilot Light to visually indicate presence of voltage on outside of switch enclosure.
- CPT - Control Power Transformer used to step down line voltage to 120VAC to power shunt trip coil.
- SW Aux. - Normally closed contact when switch is closed. Opens as power switch opens.
- Key Test - Key-to-Test switch used to operate shunt trip from the outside of switch enclosure. Can be used for trouble-shooting and inspection.
- Mechanically Interlocked Auxiliary Contact - Contact used to disconnect secondary source of power.
- - Terminal Block Connection Point.
- - Pre-wired Connection Points.

Bussmann® Power Module™ Switch

All-In-One Module

PS

Section 16XXX - Power Module Switch (Elevator) (Computer Room) (Emergency Systems)

Part 1 - General

1.01 Description

- A. Work of this section shall conform to the requirements of the Contract Documents.

1.02 Section Includes

- A. Provide Elevator Power Module Switch(es), fuses and accessories as required and specified on Contract Drawings to distribute electrical power to all Elevators.

1.03 Related Systems

- A. (Reference other sections of the specification which cover Elevator installation)

1.04 Codes

- A. All work shall be performed in accordance with the latest edition of applicable standards, codes and laws.
1. NFPA 70 - 1999 Section 620-51 (a)-(c), 620-62, 620-91(c)
 2. Canadian Electric Code Part 1 38-034(3)
 3. ANSI/ASME A17.1 - 1996 Section 102.2 (c) (3)
 4. BOCA 3006.2.3
 5. NFPA 72 - 1999 Section 3-9.4.4

1.05 Standards

- A. Except as modified by governing codes, all equipment shall be manufactured in accordance with the latest applicable standards:
1. Enclosed Switches, U.L. 98 and CSA - C22.2 No. 4

1.06 Substitutions

- A. Substitutions shall comply with the requirements of the General Conditions and General Requirements. The names of manufacturers and model numbers have been used to establish types of equipment and standards of quality. A submittal shall contain sufficient information to prove compliance with Contract Documents. This includes compliance with all pertinent sections of codes and standards as specified above.

1.07 Submittals

- A. Submit shop drawings and product data under the provisions of the General Conditions.
- B. Product Data: Provide manufacturer's catalog information showing dimensions, configurations, and methods of mounting and installation.
- C. Submit listing of all types, sizes and quantity of fuses which will be installed including the location of each.
- D. Spare fuses shall be supplied as required by (reference fuse specification section).

Part 2 - Products

2.01 Manufacturers

- A. Bussmann® Power Module™ Switch - PS

2.02 General Conditions & Requirements

- A. Provide Power Module Switch in a single NEMA enclosure with all necessary relay(s), control transformer and other options (as listed below), and as shown on drawings. The Power Module Switch shall be constructed, listed, and certified to the standards as listed in above. The Power Module Switch shall have an ampere rating as shown on the Contract Drawings, and shall include a horsepower rated fusible switch with shunt trip capabilities. The ampere rating of the switch shall be based upon elevator manufacturer requirements and utilize Class J Fuses (provided separately). It shall include as an accessory, a 100VA control power transformer with primary and secondary fuses. The primary voltage rating shall be _____ volts with a 120 volt secondary. It shall also contain an isolation relay (3PDT, 10 amp, 120V). The coil of the isolation relay shall be _____ (120 V AC or 24 V DC). A normally open dry contact shall be provided by the Fire Alarm Safety System to energize the isolation relay and activate the shunt trip solenoid (140VA inrush at 120V). (Note: If 24 V DC coil is selected, a separate 24 V DC source and contact

must be provided by the Fire Alarm Safety System.)

The module shall contain the following options:

- _____ Key to Test Switch
- _____ "ON" Pilot Light (Green, Red or White)
- _____ Isolated Full Capacity Neutral Lug
- _____ 1P NC Mechanically Interlocked Auxiliary Contact (required for hydraulic elevators with automatic recall).
- _____ Fire Alarm Voltage Monitoring Relay (Needed to comply with NFPA 72)
- _____ NEMA _____ Enclosure (NEMA 1 standard), 12, 3R or 4) (through 200A)

Complete catalog number for the Power Module Switch shall be _____.

The module shall have been successfully tested to a short circuit rating with Bussmann® LOW-PEAK® Class J fuses at 200,000 amps RMS Symmetrical. All switches shall have shunt trip capabilities at 120 V AC from remote fire safety signal. Branch feeders shall be selectively coordinated and fed with an upstream supply overcurrent protective device at a minimum of 2:1 size ratio utilizing LOW-PEAK® (Class J, RK1, or L) fuses.

Part 3 - Execution

3.01 Installation

- A. All material installation shall be in accordance with manufacturers recommendations and the provisions of applicable codes.
- B. Fuses shall not be installed until equipment is ready to be energized.

The only controlled copy of this BIF document is the electronic read-only version located on the Bussmann Network Drive. All other copies of this document are by definition uncontrolled. This bulletin is intended to clearly present comprehensive product data and provide technical information that will help the end user with design applications. Bussmann reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Bussmann also reserves the right to change or update, without notice, any technical information contained in this bulletin. Once a product has been selected, it should be tested by the user in all possible applications.