EASTERN WASHINGTON UNIVERSITY
NEW RESIDENCE HALL

DESIGN DEVELOPMENT SUBMITTAL

EQUIPMENT CUT SHEETS

ALSC ARCHITECTS
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PLUMBING CUT SHEETS

MECHANICAL HVAC CUT SHEETS

LIGHTING CUT SHEETS

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PLUMBING CUT SHEETS
AFWALL® FloWise® ELONGATED TOILET
with EVERCLEAN®

- Wall-mounted flushometer valve toilet
- Vitreous china
- High Efficiency, Low Consumption. Operates in the range of 1.1 gpf to 1.6 gpf (4.2 Lpf to 6.0 Lpf)
- Meets definition of HET (High Efficiency Toilet) when used with a high efficiency flush valve (1.28 gpf or 1.6 / 1.1 gpf dual flush)
- Permanent EverClean® surface inhibits the growth of stain- and odor-causing bacteria, mold, and mildew on the surface
- Condensation channel
- Elongated bowl
- Powerful direct-fed alphon jet action
- 1-1/2" inlet spud
- Fully-glazed 2-1/8" trapway
- 10" x 12" water surface area
- 100% factory flush tested

☐ 3351.001 Elongated bowl only, top spud
☐ 3352.001 Elongated bowl only, top spud with slotted rim for bedpan holding (White only)
☐ 3353.001 Elongated bowl only, back spud
☐ 3354.001 Elongated bowl only, back spud with slotted rim for bedpan holding (White only)

Component Parts:
☐ 047007-0070A Inlet Spud (furnished with bowl)

Nominal Dimensions:
660 x 356 x 381mm
(26" x 14" x 15")

Recommended working pressure—between 25 psi at valve when flushing and 80 psi static

Fixture only, less seat, bolt caps, and flushometer valve

Compliance Certifications - Meets or Exceeds the Following Specifications:
- ASME A112.19.2-2008/CSA B45.1-08 for Vitreous China Fixtures

SEE REVERSE FOR ROUGHING-IN DIMENSIONS

To Be Specified:
☐ Color: □ White □ Bone □ Linen
☐ Seat:
 □ American Standard #5901.100 Heavy duty open front less cover
 □ American Standard #5905.100 Extra heavy duty open front less cover
☐ Flushometer Valve:
☐ 1.6 gpf:
 □ Sensor-Operated: American Standard Selectronic®
  DC Power #6065.161.002 (Top Spud)
 □ Sensor-Operated: American Standard Selectronic®
  AC Power #6067.282.002 (Back Spud)
  (Top Spud)
☐ 1.28 gpf:
 □ Sensor-Operated: American Standard Selectronic®
  DC Power #6065.121.002 (Top Spud)
 □ Sensor-Operated: American Standard Selectronic®
  AC Power #6067.222.002 (Back Spud)
 □ Manual: American Standard #6047.121.002
  (Top Spud)
☐ 1.6 / 1.1 gpf Dual Flush:
 □ Sensor-Operated: American Standard Selectronic®
  DC Power #6065.761.002 (Top Spud)

MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND ANSI A117.1 REQUIREMENTS FOR ACCESSIBLE AND USABLE BUILDING FACILITIES - CHECK LOCAL CODES.

* When installed so top of seat is 432 to 483mm (17" to 19") from the finished floor.

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NOTES:
- Toilet designed to meet ADA accessibility standards when top of seat height set at 432 to 483 mm (17" to 19") from finished floor.
- PRODUCT 3351 AND 3353 SHOWN, 3352 AND 3354 SAME EXCEPT WITH SLOTTED RIM FOR BED PAN HOLDING.
- WASTE OUTLET SEAL RING MUST BE NEOPRENE OR GRAPHITE-FELT (WAX RING NOT RECOMMENDED).
- SUGGESTED 2mm (1/16) CLEARANCE BETWEEN FACE OF WALL AND BACK OF BOWL.
- TO COMPLY WITH AREA CODE GOVERNING THE HEIGHT OF VACUUM BREAKER ON THE FLUSHOMETER VALVE, THE PLUMBER MUST VERIFY DIMENSIONS SHOWN FOR SUPPLY ROUGHING.
- FLUSHOMETER VALVE NOT INCLUDED WITH FIXTURE AND MUST BE ORDERED SEPARATELY.
- CARTRIDGE FITTINGS AS REQUIRED TO BE FURNISHED BY OTHERS. PROVIDE SUITABLE REINFORCEMENT FOR ALL WALL SUPPORT.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2.
- These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.
**Uppercut™**

*The Fastest Way to Start Saving Water!*

**Dual Flush Flushometer WES-111**

- **Description**
  Exposed Water Closet Flushometer with Dual Flush Feature, for floor mounted or wall hung top spud bowls.

- **Flush Cycle**
  WES-111 High Efficiency (Down 1.6 gpf/6.0 Lpf, Up 1.1 gpf/4.2 Lpf)

- **Specifications**
  Dual Flush, Quiet, Exposed, Diaphragm Type, Chrome Plated Closet Flushometer with the following features:
  - Lifting Handle UP initiates reduced flush (1.1 gpf/4.2 Lpf), eliminating liquid and paper waste, saving a 1/4-gallon of water.
  - Pushing Handle DOWN initiates full flush (1.6 gpf/6.0 Lpf), eliminating all waste.
  - Reduces water volume by up to 30% when activated UPWARDS
  - Antimicrobial Coating on Handle protects against germs.
  - PERMEX™ Synthetic Rubber Diaphragm with Dual Filtered Bypass.
  - Distinctive Green ADA Compliant Metal Non-Hold-Open Handle with Triple Seal Handle Packing signifies Water Conserving Device.
  - 1" L.P.S. Screwdriver Bok-Chok™ Angle Stop
  - Free Spinning Vandal Resistant Stop Cap
  - Adjustable Tailpiece
  - High Back Pressure Vacuum Breaker Flush Connection with One-piece Bottom Hex Coupling Nut
  - Spud Coupling and Flange for 1 1/2" Top Spud
  - Sweat Solder Adaptor with Cover Tube and Cet Set Screw Wall Flange
  - High Copper, Low Zinc Brass Castings for Desalination Resistance
  - Non-Hold-Open Handle, Fixed Metering Bypass and No External Volume Adjustment to Ensure Water Conservation
  - Pulse Accuracy Controlled by CIO™ Technology
  - Diaphragm, Handle Packing, Stop Seat and Vacuum Breaker molded from PERMEX™ Rubber Compound for Chloramine Resistance
  - Includes two (2) adhesive backed Metal Wall Plates etched with Instructions

Valve Body, Cover, Tailpiece and Control Stop shall be in conformance with ASTM Alloy Classification for Semi-Rod Brass. Valve shall be in compliance to the applicable sections of ASSE 1037.

- **Variations**
  - [ ] TP Trap Primer
  - [ ] YG Extended Bumper on Angle Stop (for seat with cover)
  - [ ] YO Bumper on Angle Stop (for open front seat without cover)

- **Accessories**
  See Accessories Section of the Sloan catalog for details on these and other Flushometer variations.

- **Fixtures**
  Consult Sloan for Sloan brand matching fixture options.

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**SLOAN VALVE COMPANY** • 10500 SEYMOUR AVE. • FRANKLIN PARK, IL 60131
Ph: 1-800-9-VALVE-9 or 1-847-671-4300 • Fax: 1-800-447-8329 or 1-847-671-4380
www.sloanchrome.com

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*This space for Architect/Engineer approval*

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*The information contained in this document is subject to change without notice.*
COMMERCIAL PLASTIC SEATS

MODEL 9500C

- ELONGATED SEAT, OPEN FRONT LESS COVER
- SOLID PLASTIC
- CONCEALED CHECK STAINLESS STEEL HINGES

Seats shall be No._______ as manufactured by Church Seats. Seats shall be extra heavy weight and injection molded of solid plastic. Seats shall be open front less cover for elongated bowl and feature large molded-in bumpers. Concealed check hinges to feature 300 Series stainless steel posts that stop seat 11 degrees beyond vertical. Uses 300 Series stainless steel hardware. Color to be __________ (specify white or fixture manufacturer’s color) Hinges shall be __________ (specify hinge type)

9500C Concealed check hinge stops seat 11° beyond vertical,
95000SCI Self-sustaining, concealed stainless steel check hinge holds seat in any raised position up to 11° beyond vertical.

** ANSI Z124.5 section 5.1.2 Tests have shown that this product will support weights up to 500 pounds.** (Contact Church Seat Co., for test data)
HI-SET ELEVATED AND STANDARD ADJUSTABLE FIXTURE SUPPORTS

VERTICAL FITTINGS WITH SIDE INLETS

Lower inlet hub allows elevated water closet to be placed on stack without affecting rough-in of a regular height horizontal battery.

SINGLE

- Rear Support Lug Regularly Furnished. (_w/ Optional Foot Assembly Available when specified)
- Fig. 0175L...CAULK LEFT HAND LONG BARREL
- Fig. 0175R...CAULK RIGHT HAND LONG BARREL
- Fig. 0175D...NO-HUB DOUBLE LONG BARREL
- Fig. 0175Y...NO-HUB LEFT HAND
- Fig. 0175DY...NO-HUB DOUBLE

DOUBLE

- 2" Vent
- Fig. 0176D...NO-HUB DOUBLE

FITTINGS WITH TWO SIDE INLETS

- Fig. 0165...CAULK LONG BARREL
- Fig. 0165D...CAULK DOUBLE LONG BARREL
- Fig. 0165Y...NO-HUB
- Fig. 0165DY...NO-HUB DOUBLE

Siphon jet supports shown. For comparable blowout supports, change second digit of figure number from 1 to 3.

Example: Fig. 0175L...CAULK LEFT HAND
Fig. 0175Y...NO-HUB

NOTE: Base support must be securely anchored to floor (with four 1/2" bolts provided by contractor).

HORIZONTAL FITTINGS WITH 2" AUXILIARY NO-HUB INLET

- Rear Support Lug Regularly Furnished. (w/ Optional Foot Assembly Available when specified)
- 2" Auxiliary NO-HUB Inlet
- Fig. 0209Y...NO-HUB LEFT HAND
- Fig. 0209RY...NO-HUB RIGHT HAND
- Fig. 0210LY...NO-HUB LEFT HAND LONG BARREL
- Fig. 0210RY...NO-HUB RIGHT HAND LONG BARREL

NOTE: Base support must be securely anchored to floor (with four 1/2" bolts provided by contractor).

Dimensions: 4" (dimension furnished) consisting of nipple and adjusting coupling permitting adjustment from 3" min. to 4" max. Refer to Page 611.
ADJUSTABLE FIXTURE SUPPORTS FOR SIPHON JET WATER CLOSETS

HUB & SPIGOT HORIZONTAL FITTINGS

SINGLE

Rear Support Lug Regularly Furnished.
- M61 Anchor Foot Assembly Available
  (when specified)

Fig. 0210R
Top View

Fig. 0210L
CAULK LEFT HAND
Fig. 0210R
CAULK RIGHT HAND
Fig. 0210D
CAULK DOUBLE
Fig. 0220L
CAULK LEFT HAND LONG BARREL
Fig. 0222R
CAULK RIGHT HAND LONG BARREL
Fig. 0222D
CAULK DOUBLE LONG BARREL

Service Weight Furnished

Dimension = 4" (regularly furnished) consisting of
riggle and Adjus-to-Wall coupling permitting adjust-
ment from 9" min. to 4" max. Refer to Page 0-06.

Siphon Jet supports shown. For compara-
able blowout supports, change second
digit of figure number from 2 to 3:

Example: Fig. 0210L
Fig. 0610L
top view

DOUBLE

Finished Wall

Fig. 0210D
Top View

Fig. 0210DY
Top View

NO-HUB HORIZONTAL FITTINGS

SINGLE

Rear Support Lug Regularly Furnished.
- M61 Anchor Foot Assembly Available
  (when specified)

Fig. 0210FY
Top View

Fig. 0210LY
NO-HUB LEFT HAND
Fig. 0210RY
NO-HUB RIGHT HAND
Fig. 0210DY
NO-HUB DOUBLE
Fig. 0220LY
NO-HUB LEFT HAND LONG BARREL
Fig. 0220RY
NO-HUB RIGHT HAND LONG BARREL
Fig. 0220DY
NO-HUB DOUBLE LONG BARREL

Dimension = 4" (regularly furnished) consisting of
riggle and Adjus-to-Wall coupling permitting adjust-
ment from 9" min. to 4" max. Refer to Page 0-06.

Siphon Jet supports shown. For compara-
able blowout supports, change second
digit of figure number from 2 to 3:

Example: Fig. 0210Y
Fig. 0610Y

top view

DOUBLE

Finished Wall

Fig. 0210DY
Top View

Fig. 0210D
Top View

A
B
C
D
E

NOTE: Base support must be securely anchored to
floor (with four 1/2" bolts provided by contractor).

SIZE

MIN

MAX

E

4

14

7

3/8

2

1/4

5

15

6/8

9

3/8

2

3/4

0210Y SERIES

0210 SERIES
AFWALL® FioWise® ELONGATED TOILET
with EVERCLEAN®

- Wall-mounted flushometer valve toilet
- Vitreous china
- High Efficiency, Low Consumption. Operates in the range of 1.1 gpf to 1.6 gpf (4.2 Lpf to 6.0 Lpf)
- Meets definition of HET (High Efficiency Toilet) when used with a high efficiency flush valve (1.28 gpf or 1.6 / 1.1 gpf dual flush)
- Permanent EverClean® surface inhibits the growth of stain- and odor-causing bacteria, mold, and mildew on the surface
- Condensation channel
- Elongated bowl
- Powerful direct-fed siphon jet action
- 1-1/2" inlet spud
- Fully-glazed 2-1/8" trapway
- 10" x 12" water surface area
- 100% factory flush tested

3351.001 Elongated bowl only, top spud
3352.001 Elongated bowl only, top spud with slotted rim for bedpan holding (White only)
3353.001 Elongated bowl only, back spud
3354.001 Elongated bowl only, back spud with slotted rim for bedpan holding (White only)

Component Parts:
- 047007-0070A Inlet Spud (furnished with bowl)

Nominal Dimensions:
660 x 356 x 381 mm
(26" x 14" x 15"

Recommended working pressure—between 25 psi at valve when flushing and 80 psi static

Fixture only, less seat, bolt caps, and flushometer valve

Compliance Certifications - Meets or Exceeds the Following Specifications:
- ASME A12.19.2-2008/CSA B45.1-08 for Vitreous China Fixtures

SEE REVERSE FOR ROUGHING-IN DIMENSIONS

To Be Specified:
- Color: □ White □ Bone □ Linen
- Seat:
  □ American Standard #5901.100 Heavy duty open front less cover
  □ American Standard #5905.100 Extra heavy duty open front less cover
- Flushometer Valve:
  □ 1.6 gpf:
    □ Sensor-Operated: American Standard Selectronic®
      DC Power #6065.161.002 (Top Spud)
    □ Sensor-Operated: American Standard Selectronic®
      AC Power #6067.262.002 (Back Spud)
    □ Manual: American Standard #6047.161.002 (Top Spud)
  □ 1.28 gpf:
    □ Sensor-Operated: American Standard Selectronic®
      DC Power #6065.121.002 (Top Spud)
    □ Sensor-Operated: American Standard Selectronic®
      AC Power #6067.222.002 (Back Spud)
    □ Manual: American Standard #6047.121.002 (Top Spud)
  □ 1.6 / 1.1 gpf Dual Flush:
    □ Sensor-Operated: American Standard Selectronic®
      DC Power #6065.761.002 (Top Spud)

MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES
AND ANSI A117.1 REQUIREMENTS FOR ACCESSIBLE AND USABLE BUILDING FACILITIES - CHECK LOCAL CODES.
- When installed so top of seat is 432 to 483 mm (17" to 19") from the finished floor.

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EVERCLEAN®
Surface
NOTES:
- Toilet designed to meet ADA accessibility standards when top of seat height set at 432 to 483mm (17½" to 19") from finished floor.
- PRODUCT 3351 and 3353 SHOWN, 3352 AND 3354 SAME EXCEPT WITH SLOTTED RIM FOR BED PAN HOLDING.
- WASTE OUTLET SEAL RING MUST BE NEOPRENE OR GRAPHITE-FELT (WAX RING NOT RECOMMENDED).
- SUGGESTED 2mm (⅛") CLEARANCE BETWEEN FACE OF WALL AND BACK OF BOWL.
- TO COMPLY WITH AREA CODE GOVERNING THE HEIGHT OF VACUUM BREAKER ON THE FLUSHOMETER VALVE, THE PLUMBER MUST VERIFY DIMENSIONS SHOWN FOR SUPPLY ROUGHING.
- FLUSHOMETER VALVE NOT INCLUDED WITH FIXTURE AND MUST BE ORDERED SEPARATELY.
- CARRIER Fitting as required to be furnished by others. PROVIDE SUITABLE REINFORCEMENT FOR ALL WALL SUPPORT.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.
**UpperCut™**
The Fastest Way to Start Saving Water!

**For P2**

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**Dual Flush Flushometer WES-111**

- **Description**
  Exposed Water Closet Flushometer with Dual Flush Feature, for floor mounted or wall hung top spud bowls.

- **Flush Cycle**
  WES-111 High Efficiency (Down 1.6 gpf/6.0 Lpf, Up 1.1 gpf/4.2 Lpf)

- **Specifications**
  Dual Flush, Quiet, Exposed, Diaphragm Type, Chrome Plated Closet Flushometer with the following features:
  - Lifting Handle UP initiates reduced flush (1.1 gpf/4.2 Lpf), eliminating liquid and paper waste, saving a .5-gallon of water
  - Pushing Handle DOWN initiates full flush (1.6 gpf/6.0 Lpf), eliminating all waste
  - Reduces water volume by up to 30% when actuated UPWARDS
  - Antimicrobial Coating on Handle protects against germs
  - PERMEX™ Synthetic Rubber Diaphragm with Dual Filtered Fixed Bypass
  - Distinctive Green ADA Compliant Metal Non Hold-Open Handle with Triple Seal Handle Packing signifies Water Conserving Device
  - 1" P.S. Screwdriver Bak-Chek™ Angle Stop
  - Free Spinning Vandal Resistant Stop Cup
  - Adjustable Tripiece
  - High Back Pressure Vacuum Breaker Flush Connection with One-piece Bottom Hex Coupling Nut
  - Spud Coupling and Flange for 1 1/2" Top Spud
  - Sweat Solder Adapter with Cover Tube and Cast Set Screw Wall Flange
  - High Copper, Low Zinc Brass Castings for Desalinication Resistance
  - Non-Hold-Open Handle, Fixed Metering Bypass and No External Volume Adjustment to Ensure Water Conservation
  - Flush Accuracy Controlled by CID™ Technology
  - Diaphragm, Handle Packing, Stop Seat and Vacuum Breaker molded from PERMEX™ Rubber Compound for Chloramines Resistance
  - Includes two (2) adhesive backed Metal Wall Plates etched with Instructions

Valve Body, Cover, Tripiece and Control Stop shall be in conformance with ASTM Alloy Classification for Semi-Red Brass. Valves shall be in compliance to the applicable sections of ASSE 1037.

- **Variations**
  - TP Trap Primer
  - YG Extended Bumper on Angle Stop (for seat with cover)
  - YO Bumper on Angle Stop (for open front seat without cover)

- **Accessories**
  See Accessories Section of the Sloan catalog for details on these and other Flushometer variations.

- **Fixtures**
  Consult Sloan for Sloan brand matching fixture options.
**COMMERCIAL PLASTIC SEATS**

**MODEL 9500C**

- ELONGATED SEAT, OPEN FRONT LESS COVER
- SOLID PLASTIC
- CONCEALED CHECK STAINLESS STEEL HINGES

Seats shall be No._________ as manufactured by Church Seats. Seats shall be extra heavy weight and injection molded of solid plastic. Seats shall be open front less cover for elongated bowl and feature large molded-in bumpers. Concealed check hinges to feature 300 Series stainless steel posts that stop seat 11 degrees beyond vertical. Uses 300 Series stainless steel hardware. Color to be ___________ (specify white or fixture manufacturer's color) Hinges shall be _________ (specify hinge type)

9500C Concealed check hinge stops seat 11° beyond vertical.
9500SC Self-sustaining, concealed stainless steel check hinge holds seat in any raised position up to 11° beyond vertical.

**ANSI Z124.5 section 5.1.2 Tests have shown that this product will support weights up to .500 pounds.** *(Contact Church Seat Co., for test data)*

Church Seats, Sheboygan Falls, WI 53085
www.ChurchSeats.com

Phone: 920-467-2564  800-233-7328   Fax: 920-467-8573
HI-SET ELEVATED AND STANDARD ADJUSTABLE FIXTURE SUPPORTS

VERTICAL FITTINGS WITH SIDE INLETS

Lower inlet hub allows elevated water closet to be placed on stack without affecting rough-in of a regular height horizontal battery.

SINGLE

Rear Support Lug Regularly Furnished.
MS1 Anchor Foot Assembly Available when specified.

DOUBLE

2" Vent

Finished Wall

Fig. 0175L
Fig. 0185 Side View

Fig. 0175L...CAULK LEFT HAND LONG BARREL
Fig. 0175R...CAULK RIGHT HAND LONG BARREL
Fig. 0175D...CAULK DOUBLE LONG BARREL
Fig. 0175LY...NO-HUB LEFT HAND
Fig. 0175RY...NO-HUB RIGHT HAND
Fig. 0175DY...NO-HUB DOUBLE

Service Weight Furnished

DIMENSION - 4" (regularly furnished) consisting of nipple and Adapta-to-Wall coupling permitting adjustment from 3" min. to 4" max. Refer to Page 0-06.

FITTINGS WITH TWO SIDE INLETS

Siphon Jet supports shown. For comparable blowout supports, change second digit of figure number from 1 to 3.

Example: Fig. 0175L, 0185 siphon jet
Fig. 0375L, 0395 blowout

NOTE: Base support must be securely anchored to floor (with four 1/2" bolts provided by contractor).

HORIZONTAL FITTINGS WITH 2" AUXILIARY NO-HUB INLET

2" Auxiliary NO-HUB Inlet

Siphon Jet

Fig. 0209Y Top View

Fig. 0209LY...NO-HUB LEFT HAND
Fig. 0209RY...NO-HUB RIGHT HAND
Fig. 0219LY...NO-HUB LEFT HAND LONG BARREL
Fig. 0219RY...NO-HUB RIGHT HAND LONG BARREL

NOTE: Base support must be securely anchored to floor (with four 1/2" bolts provided by contractor).

0209Y SERIES

DIMENSION - 4" (regularly furnished) consisting of nipple and Adapta-to-Wall coupling permitting adjustment from 3" min. to 4" max. Refer to Page 0-06.
ADJUSTABLE FIXTURE SUPPORTS FOR SIPHON JET WATER CLOSETS

HUB & SPIGOT HORIZONTAL FITTINGS

SINGLE

Figure 0210R
Top View

Figure 0210D
Top View

SIPHON JET
Front View

Figure 0220L
Top View

Figure 0220D
Top View

NOTES:

1. Not dimension = 4" (regularly furnished) consisting of nipple and Adap-To-Wall coupling permitting adjustment from 3" min. to 4" max. Refer to Page 9-06.
2. Siphon jet supports shown. For comparable blowout supports, change second digit of figure number from 2 to 3.
   Example: Figure 0210L
   Figure 0210D
   Siphon jet
   Blowout

0210 0220 SERIES

NO-HUB HORIZONTAL FITTINGS

SINGLE

Figure 0210RY
Top View

Figure 0220RY
Top View

SIPHON JET
Front View

Figure 0220DY
Top View

NOTES:

1. Not dimension = 4" (regularly furnished) consisting of nipple and Adap-To-Wall coupling permitting adjustment from 3" min. to 4" max. Refer to Page 9-06.
2. Siphon jet supports shown. For comparable blowout supports, change second digit of figure number from 2 to 3.
   Example: Figure 0210LY
   Figure 0210DY
   Siphon jet
   Blowout

0210Y SERIES

NOTE: Base support must be securely anchored to floor (with four 1/2" bolts provided by contractor).
ORBIT™ UNDERCOUNTER SINK

- Round undermount sink
- Made from vitreous china
- Front overflow
- Unglazed rim for undercounter mounting
- Supplied with mounting kit (047194-0070A)
  - and template

0630.000 Sink less faucet deck

Nominal Dimensions:
394mm dia. (15-1/2") Round

Bowl sizes:
324mm (12-3/4") wide
111mm (4-3/8") deep

Compliance Certifications - Meets or Exceeds the Following Specifications:
- ASME A112.19.2M for Vitreous China Fixtures
- CAN/CSA B45 series

To Be Specified:
- Color: □ White □ Bone □ Linen
  □ Silver □ Fawn Beige □ Black
- Faucet*: □
- Faucet Finish:
- Supplies:
- 1-1/4" Trap:

* See faucet section for additional models available

MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES - CHECK LOCAL CODES.

Countertop 664mm (34") from finished floor. Lavatory installed 81mm (3") MIN. from front edge of countertop.

Countertop thickness to be 25mm (1") maximum.

NOTES:
- DIMENSIONS SHOWN FOR LOCATION OF SUPPLIES AND "P" TRAP ARE SUGGESTED.
- UNDERCOUNTER MOUNTING KIT SUPPLIED WITH SINK. FITTINGS NOT INCLUDED WITH FIXTURE AND MUST BE ORDERED SEPARATELY.
- USE ENCLOSED TEMPLATE FOR COUNTERTOP CUTOUT, SEALING COMPOUND SUPPLIED BY OTHERS.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.

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ECAST® MANUAL FAUCETS
2201-4ABCP

Marathon™ Lavatory Sink Faucet

Product Type
Marathon™ Lavatory Sink Faucet

Features & Specifications
• 4 3/4" C-C Integral Cast Brass Spout
• 2.2 GPM (8.3 L/min) Pressure Compensating Softflo®
Aerator
• 2 3/4" Metal Lever Handle with Color Coded Temperature Indicator on Cap
• Ceramic Disc Operating Cartridge with Temperature Limit Stop
• 3/8" O.D. Copper Supply Tube Inlets
• 4" C-C Deck Cover Plate
• ECAST® design provides durable brass construction with total lead content equal to or less than 0.25% by weighted average

Performance Specification
• Rating Operating Pressure: 20-125 PSI
• Rated Operating Temperature: 40-140°F

Warranty
• Lifetime Limited Faucet Warranty
• 5-Year Limited Cartridge Warranty
• 1-Year Limited Finish Warranty

Codes & Standards
• ASME A112.18.1M
• CSA B125.1
• California Health and Safety Code 116875 (AB1953-2006)
• Vermont Bill S.152
• ADA ANSI/ICC A117.1

ECAST®
ECAST products are intended for installation where state laws and local codes mandate lead content levels, or in any location where lead content is a concern.
Marathon™ Lavatory Sink Faucet

Architect/Engineer Specification

Chicago Faucets No. 2201-4ABCP, polished chrome plated solid cast brass body construction. ECAST® construction with less than 0.25% lead content by weighted average. Integral 4-3/4" C-C spout and 6 1/8" x 2-1/4" cover plate. 2.2 GPM pressure compensating aerator outlet. Metal lever handle with temperature limit stop and volume control. Ceramic mixing cartridge. 3/8" copper tube supply inlets. All mounting hardware is included for standard lavatory installations. Includes pop-up. This product meets ADA ANSI/ICC A117.1 requirements and is tested and certified to industry standards: ASME A112.18.1M, CSA B125.1, California Health and Safety Code 116875 (AB1953-2006), and Vermont Bill S.152.

Operation and Maintenance

Installation should be in accordance with local plumbing codes. Flush all pipes thoroughly before installation. After installation, remove spout outlet or flow control and flush faucet thoroughly to clear any debris. Care should be taken when cleaning the product. Do not use abrasive cleaners, chemicals or solvents as they can result in surface damage. Use mild soap and warm water for cleaning and protecting the life of Chicago Faucet products. For specific operation and maintenance refer to the installation instructions and repair parts documents that are located at www.chicagofaucets.com.

Chicago Faucets, member of the Geberit Group, is the leading brand of commercial faucets and fittings in the United States, offering a complete range of products for schools, laboratories, hospitals, office buildings, food service, airports and sport facilities. Call 1.800.TECTRUE or 1.847.803.5000 Option 1 for installation or other technical assistance.
DESCRIPTION
- Chrome plated metal construction
- Pressure balancing cycle valve design with 1/4 turn stops
- 1/2" CC connections
- Shower arm has 1/2" IPS male thread
- Supplied with vandal resistant screws
- Quick cleaning rubber nozzles

OPERATION
- Temperature valve has ADA compliant lever handle
- Handle operates counterclockwise through a 270° arc with shut off at 6 o'clock, and maximum hot at the 9 o'clock position.
- Adjustable temperature limit stop
- Pressure balancing mechanism maintains selected discharge temperature to ± 2°F

FLOW
- Vandal resistant shower head 1.5 gpm (5.7 L/min) maximum at 80 psi, 1.1 gpm (4.2 L/min) minimum at 45 psi

CARTRIDGE
- 1222 cartridge design
- Nonmetallic/nonferrous and stainless steel materials
- Accommodates back-to-back installations

STANDARDS
- Third party certified to ASME A112.18.1/CSA B125.1 and all applicable requirements referenced therein including ASSE 1016
- ADA for lever handle

WARRANTY
- Warranted for 5 years against material or manufacturing defects

SPECIFICATIONS

Single-Handle Pressure Balancing
Shower Valve only
with Integral Stops and HAF

Model: 8375EP15

CRITICAL DIMENSIONS

(DO NOT SCALE)

MOEN SPECIFIER SERVICES 1-800-321-8809 Ext. 2158
www.moen.com
MOEN® COMMERCIAL

Specifications

Three-Function Commercial Shower System

Model: 8342EP15

DESCRIPTION
- Chrome plated metal construction
- Pressure balancing cycle valve design with 1/4 turn stops
- 3 function transfer valve
- 1/2" CC connections
- Shower arm has 1/2" IPS male thread
- Contains: showerhead, hand-held shower, 69" metal hose, 30" slide bar, drop ell, vacuum breaker and mounting hardware
- Slide bar is NOT DESIGNED TO BE A GRAB BAR
- Supplied with vandal resistant screws
- Quick cleaning rubber nozzles

OPERATION
- Temperature and transfer valve both have ADA compliant lever style handles
- Handle operates counterclockwise through a 270° arc
- With off at 6 o'clock, and maximum hot at the 9 o'clock position
- Shut off in clockwise direction
- Adjustable temperature limit stop
- Pressure balancing mechanism maintains selected discharge temperature to ± 2°
- Transfer valve operates 3 distinct functions
- Single function spray pattern
- Easy to operate pause button (reduces the flow of water to a trickle)

FLOW
- 1.5 gpm (5.7 L/min) MAX at 80 psig / 1.1 gpm (4.2 L/min) MIN at 45 psi
- hand-held shower and stationary shower head

CARTRIDGE
- 1222 cartridge design in temperature control valve
- Accommodates back-to-back installations
- Ceramic disc cartridge in transfer valve
- Non metallic/nonferrous and stainless steel materials

STANDARDS
- Third party certified to ASME A112.18.1/CSA B125.1 and all applicable requirements referenced therein including ASSE 1016
- ADA for lever handle

WARRANTY
- Warranted for 5 years against material or manufacturing defects

NOTE: This valve is not intended to be used as a shut-off valve. To prevent the potential of cross flow, check valves must be integral to the supply valve or installed in both hot and cold water supply lines.

CRITICAL DIMENSIONS

(Do not scale)

MOEN SPECIFIER SERVICES 1-800-321-8809 Ext. 2158
www.moen.com

Rev. 11/10
**ELKAY**

**SPECIFICATIONS**

**GENERAL**
Highest quality sink formed of #18 (1.2mm) gauge, type 304 (18-8) nickel bearing stainless steel. Select models available with Statement feature. Undermount.

**DESIGN FEATURES**
- Bowl Depths: 7-7/8" (200mm) (ELUH31118), 10" (254mm) (ELUH311810), 7-7/8" (200mm) shallow bowl, 10" (254mm) deep bowl (ELUH311810LJR).
- Coved Corners: 1-3/4" (44mm) vertical and horizontal radius.
- Finish: Exposed surfaces are hand blended to a Lustrous Highlighted Satin finish.
- Underside: Underside of sink is fully protected by heavy duty Sound Guard™ undercoating to reduce condensation and dampen sound.

**OTHER**
- Drain Opening: 3-1/2" (89mm).
- Note: All Elkay undermount sinks are designed to affix to the underside of any solid surface countertop.
- Sink complies with ASME A112.19.3-2005 / CSA B45.4-08.
- These sinks are listed by the International Association of Plumbing and Mechanical Officials as meeting the requirements of the Uniform Plumbing Code.

**OPTIONAL ACCESSORIES**
- Bottom Grid: LKWOBG1316SS
- Cutting Boards: CB1316, CB1713, CBR1316, CBS1316
- Drain: LK99
- Mounting Clip: LKUCLIP8 (2 packages required)
- Rinsing Baskets: LKWRB1316SS, LKWERBSS
- Utensil Caddy for Rinsing Basket: LKWUCSS

**SINK PACKAGE(S)**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>SINK</th>
<th>BOTTOMGRID</th>
<th>QTY</th>
<th>DRAIN</th>
<th>QTY</th>
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<tr>
<td>ELUH3118DBG</td>
<td>ELUH3118</td>
<td>LKWOBG1316SS</td>
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**OPTIONAL STATEMENT FEATURE**

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<tr>
<th>Part No. Suffix for Statement Option</th>
<th>Pattern Name</th>
<th>Pattern Name Graphic</th>
<th>Pattern Style &amp; Location</th>
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<td>BAP</td>
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<td>Patch — rear wall only, in the left bowl.</td>
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<td>GFT</td>
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<td>GRK</td>
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<td>CST</td>
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<tr>
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<td>Vino</td>
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In keeping with our policy of continuing product improvement, Elkay reserves the right to change product specifications without notice. Please visit elkayusa.com for most current version of Elkay product specification sheets.

**Gourmet® Undermount Double Bowl Sink Model ELUH3118 Series**

**SINKS ARE MADE IN THE USA**

**Installation Profile**

The template provided with each sink provides the only type of installation recommended by Elkay.

**SEE OTHER SIDE FOR PRODUCT DIMENSIONS.**

---

**Elkay**
2222 Camden Court
Oak Brook, IL 60523

**Elkayusa.com**

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(Rev. 03/11) 1-109J
### Sink Dimensions

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<tr>
<th>Model Number</th>
<th>Overall L (W x D)</th>
<th>Overall W (L x D)</th>
<th>Overall D (L x W)</th>
<th>Inside Left Bowl L x W (D)</th>
<th>Inside Left Bowl W x L (D)</th>
<th>Inside Right Bowl L x W (D)</th>
<th>Inside Right Bowl W x L (D)</th>
<th>Cutout in Countertop</th>
<th>Minimum Cabinet Size</th>
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<td>30 1/2 (768 mm)</td>
<td>18 1/2 (470 mm)</td>
<td>16 (406 mm)</td>
<td>13 1/2 (343 mm)</td>
<td>16 (406 mm)</td>
<td>7 1/8 (200 mm)</td>
<td>13 1/2 (343 mm)</td>
<td>16 (406 mm)</td>
<td>36 (914 mm)</td>
</tr>
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<td>16 (406 mm)</td>
<td>13 1/2 (343 mm)</td>
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<tr>
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<td>7 1/8 (200 mm)</td>
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<td>36 (914 mm)</td>
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<tr>
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<td>30 1/2 (768 mm)</td>
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<td>7 1/8 (200 mm)</td>
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<td>16 (406 mm)</td>
<td>36 (914 mm)</td>
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<tr>
<td>ELUH3118</td>
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<td>18 1/2 (470 mm)</td>
<td>16 (406 mm)</td>
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<td>16 (406 mm)</td>
<td>7 1/8 (200 mm)</td>
<td>13 1/2 (343 mm)</td>
<td>16 (406 mm)</td>
<td>36 (914 mm)</td>
</tr>
</tbody>
</table>

*Length is left to right. Width is front to back.
**Template #74107/60 is packed with every sink.

---

**Model ELUH3118 Illustrated**

**Model ELUH311810 Illustrated**

**Model ELUH311810L Illustrated**

**Model ELUH311810R Illustrated**
MANUAL FAUCETS
2301-8CP

Marathon™ Kitchen Sink Faucet

Product Type
Marathon™ Kitchen Sink Faucet

Features & Specifications
- 10" C-C Integral Cast Brass Swing Spout
- 2.2 GPM (8.3 L/min) Pressure Compensating Softflo®
  Aerator
- 4 5/8" Metal Lever Handle with Color Coded Temperature
  Indicator on Cap
- Ceramic Disc Operating Cartridge with Temperature Limit
  Stop
- 3/8" O.D. Copper Supply Tube Inlets
- 8" C-C Deck Cover Plate

Performance Specification
- Rating Operating Pressure: 20-125 PSI
- Rated Operating Temperature: 40-140°F

Warranty
- Lifetime Limited Faucet Warranty
- 5-Year Limited Cartridge Warranty
- 1-Year Limited Finish Warranty

Codes & Standards
- ASME A112.18.1M
- CSA B125.1
- Certified to NSF/ANSI 61, Section 9 by CSA
- ADA ANSI/ICC A117.1
2301-8CP
Marathon™ Kitchen Sink Faucet

Architect/Engineer Specification
Chicago Faucets No. 2301-8CP, polished chrome plated solid cast brass body construction with integral 10" C-C spout and 10 1/8" x 2-1/4" cover plate. 2.2 GPM pressure compensating aerator outlet. Metal lever handle with temperature limit stop and volume control. Ceramic mixing cartridge. Spray with 4 foot vinyl hose, 3 ? 8" copper tube supply inlets. All mounting hardware is included for standard lavatory installations. This product meets ADA ANSI/IFC A117.1 requirements and is tested and certified to industry standards: ASME A112.18.1M, CSA B125.1, and Certified to NSF/ANSI 61, Section 9 by CSA.

Operation and Maintenance
Installation should be in accordance with local plumbing codes. Flush all pipes thoroughly before installation. After installation, remove spout outlet or flow control and flush faucet thoroughly to clear any debris. Care should be taken when cleaning the product. Do not use abrasive cleaners, chemicals or solvents as they can result in surface damage. Use mild soap and warm water for cleaning and protecting the life of Chicago Faucet products. For specific operation and maintenance refer to the installation instructions and repair parts documents that are located at www.chicagofaucets.com.

Chicago Faucets, member of the Geberit Group, is the leading brand of commercial faucets and fittings in the United States, offering a complete range of products for schools, laboratories, hospitals, office buildings, food service, airports and sport facilities. Call 1.800.TECTRUE or 1.847.803.5000 Option 1 for installation or other technical assistance.
**SPECIFICATIONS**

**GENERAL**
- Type 304 stainless steel body and removable conical basket strainer with metal ball bearing locking stem and rubber stopper
- Fits 3-1/2" (89mm) opening
- Ultra bright polished finish
- Type 304 stainless steel 1-1/2" (38mm) x 4" (102mm) tailpiece

![Diagram of Elkay Sink Accessories: Drain Fitting Model LK99](image)

---

**In keeping with our policy of continuing product improvement, Elkay reserves the right to change product specifications without notice. Please visit elkayusa.com for the most current version of Elkay product specification sheets.**

**Elkay**
elkayusa.com

**2222 Camden Court**
Oak Brook, IL 60523

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(Rev. 10/08) 15-7D
**Stern Williams**

**HiLow® CORlow®**

**Mop Service Basins**

**Architectural Specifications**

### HiLow®

**HL-2100**

### CORlow®

**SBC-1700**

### 6" Front Drop with Stainless Steel Cap

<table>
<thead>
<tr>
<th>Model</th>
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<tr>
<td>HL-1900</td>
<td>32&quot;x32&quot;x12&quot;</td>
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<tr>
<td>HL-2000</td>
<td>36&quot;x36&quot;x12&quot;</td>
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<tr>
<td>HL-2100</td>
<td>36&quot;x24&quot;x12&quot;</td>
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### 6" Front Drop with Stainless Steel Cap All Sides

<table>
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<th>Model</th>
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<tr>
<td>HL-1810</td>
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<td>HL-1910</td>
<td>32&quot;x32&quot;x12&quot;</td>
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<td>HL-2010</td>
<td>36&quot;x36&quot;x12&quot;</td>
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<tr>
<td>HL-2110</td>
<td>36&quot;x24&quot;x12&quot;</td>
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</table>

### 6" Front Drop with Stainless Steel Cap

<table>
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<td>SBC-1700</td>
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<td>SBC-1702</td>
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<tr>
<td>SBC-1725</td>
<td>32&quot;x32&quot;x12&quot;</td>
</tr>
<tr>
<td>SBC-1750</td>
<td>36&quot;x36&quot;x12&quot;</td>
</tr>
</tbody>
</table>

- **NOTE:** 2 flange fittings extending 1" above shoulder on 2 sides.

Model No. ( ), Size ( ), as manufactured by Stern-Williams Co., Inc. Shoulders shall not be less than 9¾" high inside measurement, and not less than 1½" wide. All models have 6" drop at threshold. Drain shall be cast brass with stainless steel strainer cast integral and shall provide for a caulked lead connection not less than 1" deep to a 3" pipe. Receptor composed of pearl gray marble chips and white Portland cement ground smooth, grouted and sealed to resist stains. Stainless steel cap of one piece 20 ga., 302 stainless steel cast integral on threshold.

### Quality Optional Fittings

- **A. T-10-VB** Mop-Service sink fitting with vacuum breaker, adjustable top brace, 3/4" hose thread on spout with bucket hook inlet 8" on center, chrome finish.
- **T-15 VB** same as above with polished chrome finish.
- **B. T-25** Hose and wall hook. Hose 36" long, with 3/4" chrome couplings. Wall bracket of stainless steel.
- **C. T-40** Stainless Steel Mop Hanger of stainless steel with #4 finish... 24" long, with rubber spring loaded grips.
- **D. BP** Splash Catcher Panels of 20 ga. type 304 stainless steel.

---

**Job**

**Engineer**

**Location**

**Contractor**
**PRODUCT FEATURES**
- Complete filtered cooler and bottle filling station in a consolidated space saving ADA-compliant design
- Sanitary, no-touch, sensor activation with automatic 30-second shut-off timer
- WaterSentry® Plus 3000 gallon filter included
- Flexi-Guard® StreamSaver™ Bubbler
- Silver Ion anti-microbial protection
- Quick fill rate is 1.1 gpm for refrigerated units and 1.5 gpm for non-refrigerated units
- Laminar flow provides minimal splash
- Real drain system eliminates standing water
- Visual user interface display includes:
  - Filter Monitor indicating when replacement is necessary
  - Green Ticker counting the quantity of 16 oz. bottles saved from the landfill for non-refrigerated units and 12 oz. bottles for refrigerated units

**IMAGES**
- Model LZ8WSLKL shown. Includes Single Filtered Cooler with Bottle Filling Station.
- Model LZSTL8WSLKL shown. Includes Bi-Level Filtered Cooler with Bottle Filling Station.

**UNIT SPECIFICATIONS**
- Unit shall provide 8.0 gph of 50°F water at 90°F ambient and 80°F inlet water. Bottle filling unit shall include an electronic sensor for no-touch activation with an automatic 30-second shut-off timer. Shall provide 1.1-1.5” gpm flow rate with laminar flow to minimize splashing. Shall include anti-microbial protected plastic components to prevent mold and mildew. Cooler unit shall have push-bar activation and water-efficient StreamSaver™ bubbler. Shall include the WaterSentry® Plus filter, certified to NSF/ANSI 42 and 53 for lead reduction, with visual monitor to indicate when replacement is necessary. Bottle Filling unit shall meet ADA guidelines for parallel approach. Cooler shall meet ADA guidelines for frontal or parallel approach. Unit shall be lead-free design which meets Safe Drinking Water Act and is certified to NSF/ANSI 61 and California AB1953. Unit shall be certified to UL399 and CAN/CSA 22.2 No. 120.

**OPTIONAL ACCESSORIES**
- Vandal-resistant StreamSaver™ Bubbler
- 51300C Replacement filter
- 51300C_3PK Replacement filter 3-pack
- 36292C Receptacle Adaptor Plug

**SUGGESTED SPECIFICATION**
- Ideal for use in:
  - Educational facilities
  - Healthcare facilities
  - Sport and fitness centers
  - Airports
  - Office buildings
  - Other commercial buildings

**APPLICATIONS**
- Third Party Certified to:
  - UL399 and CAN/CSA 22.2 No. 120
  - Lead-free compliance including NSF/ANSI 61 and CA AB1953

In keeping with our policy of continuing product improvement, Elkay reserves the right to change specifications without notice. Please visit elkayusa.com for the most current version.

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14-57C (4/2010)
EZH2O is designed to fit on an EZ Cooler which is properly installed per the EZ Spec Sheet rough-in design.

*Rated for Indoor Use Only

**Single Cooler Installation**

**Bi-Level Cooler Installation**

**ELECTRICAL**
Water Cooler and EZH2O Station equipped with electric cords and three-prong molded rubber plugs for use with 15-amp minimum dual receptacle. Rated at 115 volt, 60 Hz, single phase.

Installation Notes:
- Unit will mount on bracket attached to wall by 6 holes (as shown above)
- Water and electrical will connect thru a hole punched into basin. Basin will be pre-punched.
- Refer to page 3 for single EZ rough-in.
- Refer to page 4 for bi-level EZ rough-in.

Job Name: ____________________________
Date: ____________________________ Qty: __________
Contact Info (Name, Phone, Email):
______________________________
______________________________
Approval for Manufacture Signature and Date:
______________________________

Specifications and measurements are subject to change without notification. Please visit elkayusa.com for most current version.

Models LZS8WS and LZSTL8WS
**ELKAY®**

**ROUGH-IN DIMENSIONS**

![Diagram of Elkay ROUGH-IN DIMENSIONS](image)

---

**LEGEND:**

A = Recommended Water Supply Location 3/8 O.D. Unplated Copper Tube Connect Stub With Shut-Off (By Others) - 3" (76mm) Maximum Out From Wall.

B = Recommended Location For Waste Outlet To Accommodate 1-1/2" Nominal Drain. Drain Stub 2" Out From Wall.

C = 1-1/2" Trap (Not Furnished)

D = Electrical Supply (3) Wire Recessed Box Duplex Outlet

E = Insure proper ventilation by maintaining 6" (152mm) minimum clearance from cabinet louvers to wall.

F = 7/16" Bolt Holes For Fastening Unit To Wall

---

*Reduce Height By 3" For Installation Of Children's ADA Cooler

Specifications and measurements are subject to change without notification.

Please visit elkayusa.com for most current version.
LEGEND:
A = Recommended Water Supply Location 3/8 O.D. Unplated Copper Tube Connect Stub With Shut-Off (By Others) - 3" (76mm) Maximum Out From Wall.
B = Recommended Location For Waste Outlet To Accommodate 1-1/2" Nominal Drain. Drain Stub 2" Out From Wall.
C = 1-1/2" Trap (Not Furnished)
D = Electrical Supply (3) Wire Recessed Box Duplex Outlet
E = Insure proper ventilation by maintaining 6" (152mm) minimum clearance from cabinet louvers to wall.
F = 7/16" Bolt Holes For Fastening Unit To Wall

*Reduce Height By 3" For Installation Of Children's ADA Cooler
SPECIFICATIONS
Furnish and install recessed Guy Gray washing machine outlet box. Washing Machine outlet box shall be furnished with 1/2" MIP/Sweat connection valves and a 2" Threaded drain fitting and locknut. Unit shall be Guy Gray product code 82032 as manufactured by IPS Corporation in Collierville, TN.

<table>
<thead>
<tr>
<th>PROD. CODE</th>
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<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>82032</td>
<td>B200</td>
<td>Galvanized Center Drain WMOB with 1/2&quot; MIP/Sweat Conn-2&quot; Threaded Drain</td>
</tr>
</tbody>
</table>
ELKAY
SPECIFICATIONS

Gourmet® Undermount Single Bowl Sink
Model ELU2115 and ELUH2115 Series

GENERAL
Highest quality sink formed of #18 (1.2mm) gauge, type 304 (18-8) nickel bearing stainless steel. Select models available with Statement feature, Undermount.

DESIGN FEATURES
Bowl Depth: 7-1/2" (191mm) (ELU[H]2115), 10" (254mm) (ELU[H]211510).
Coved Corners: 1-3/4" (44mm) vertical and horizontal radius.
Finish ELU2115: Exposed surfaces are hand blended to a Lustrous Satin finish.
Finish ELUH2115: Exposed surfaces are hand blended to a Lustrous Highlighted Satin finish.
Underside: Underside of sink is fully protected by heavy duty Sound Guard® undercoating to reduce condensation and dampen sound.

OTHER
Drain Opening: 3-1/2" (89mm).
Note: All Elkay undermount sinks are designed to affix to the underside of any solid surface countertop.
Sink complies with ASME A12.19.3-2008 / CSA B45.4-08.
These sinks are listed by the International Association of Plumbing and Mechanical Officials as meeting the requirements of the Uniform Plumbing Code.

OPTIONAL ACCESSORIES
Bottom Grid: LKWOBG2115SS
Cutting Board (ELUH model only): CB1516
Drain: LK99
Rinsing Baskets: LKWBR2115SS, LKWERBSS
Utensil Caddy for Rinsing Basket: LKWUCSS
Mounting Clip: LKUCCLIPS

SINK PACKAGE(S)

<table>
<thead>
<tr>
<th>MODEL</th>
<th>SINK</th>
<th>BOTTOM GRID</th>
<th>QTY</th>
<th>DRAIN</th>
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<tr>
<th>MODEL</th>
<th>SINK</th>
<th>FAUCET</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>LKGTPKG1CR</td>
<td>ELU2115</td>
<td>LKGT1041CR</td>
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</tr>
<tr>
<td>LKGTPKG1NK</td>
<td>ELU2115</td>
<td>LKGT1041NK</td>
<td>1</td>
</tr>
</tbody>
</table>

Installation Profile of ELU and ELUH Single Bowl Models
The template provided with each ELU/ELUH sink provides the only type of installation recommended by Elkay.

1/8" (3mm) Overhang (ELU Sink)

SEE OTHER SIDE FOR PRODUCT DIMENSIONS.

In keeping with our policy of continuing product improvement, Elkay reserves the right to change product specifications without notice. Please visit elkayusa.com for most current version of elkay product specification sheets.

Elkay
2222 Camden Court
Oak Brook, IL 60523

elkayusa.com

Printed in U.S.A.
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(Rev. 03/11) 1-112K
# Gourmet® Undermount Single Bowl Sink Models ELU2115 and ELUH2115 Series

## OPTIONAL STATEMENT FEATURE

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Suffix for Statement Option</th>
<th>Pattern Name</th>
<th>Pattern Graphic</th>
<th>Pattern Style &amp; Location</th>
</tr>
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<tbody>
<tr>
<td>BAP</td>
<td></td>
<td>Bon Appetit</td>
<td><img src="image" alt="Bon Appetit" /></td>
<td>Patch – rear wall only, in the left bowl.</td>
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<tr>
<td>BLS</td>
<td>-Blossom</td>
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<tr>
<td>GFT</td>
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<td><img src="image" alt="Greek Fret" /></td>
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<tr>
<td>GRK</td>
<td>Garland Kitchen</td>
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<tr>
<td>CST</td>
<td>Cornerstone</td>
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<tr>
<td>VIN</td>
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</tbody>
</table>

## SINK DIMENSIONS

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Overall Dimensions</th>
<th>Inside Bowl Dimensions</th>
<th>Cutout in Countertop</th>
<th>Minimum Cabinet Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELU2115</td>
<td>22 1/2&quot; (572mm)</td>
<td>17 1/4&quot; (438mm)</td>
<td>L: 21&quot; (533mm)</td>
<td>7 1/2&quot; (191mm)</td>
</tr>
<tr>
<td>ELU211510</td>
<td>22 1/2&quot; (572mm)</td>
<td>17 1/4&quot; (438mm)</td>
<td>L: 21&quot; (533mm)</td>
<td>10</td>
</tr>
<tr>
<td>ELUH2115</td>
<td>23 1/2&quot; (597mm)</td>
<td>18 1/4&quot; (464mm)</td>
<td>L: 21&quot; (533mm)</td>
<td>7 1/2&quot; (191mm)</td>
</tr>
<tr>
<td>ELUH211510</td>
<td>23 1/2&quot; (597mm)</td>
<td>18 1/4&quot; (464mm)</td>
<td>L: 21&quot; (533mm)</td>
<td>10</td>
</tr>
</tbody>
</table>

*Length is left to right. Width is front to back.*

**Template #74180162 (ELU2115(10)) or #74180253 (ELUH2115(10)) is packed with every sink.**

---

If you are referring to a specific question or need further clarification, please let me know! I'm here to help. ✨
MANUAL FAUCETS
2300-8CP

Marathon™ Kitchen Sink Faucet

Product Type
Marathon™ Kitchen Sink Faucet

Features & Specifications
- 10" C-C integral Cast Brass Swing Spout
- 2.2 GPM (8.3 L/min) Pressure Compensating Scufflo® Aerator
- 4 5/8" Metal Lever Handle with Color Coded Temperature Indicator on Cap
- Ceramic Disc Operating Cartridge with Temperature Limit Stop
- 3/8" O.D. Copper Supply Tube Inlets
- 8" C-C Deck Cover Plate

Performance Specification
- Rating Operating Pressure: 20-125 PSI
- Rated Operating Temperature: 40-140°F

Warranty
- Lifetime Limited Faucet Warranty
- 5-Year Limited Cartridge Warranty
- 1-Year Limited Finish Warranty

Codes & Standards
- ASME A112.18.1M
- CSA B125.1
- Certified to NSF/ANSI 61, Section 9 by CSA
- ADA ANSI/ICC A117.1

Job Name __________________________

Item Number __________________________

Section/Tag __________________________

Model Specified __________________________

Architect __________________________

Engineer __________________________

Contractor __________________________

[ ] Submitted as Shown [ ] Submitted with Variations

Date __________________________

2100 South Clearwater Drive
Des Plaines, IL
P: 847/803-5000
F: 847/803-5454
Technical: 800/TEC-TRUE
www.chicagofaucets.com
2300-8CP
Marathon™ Kitchen Sink Faucet

Architect/Engineer Specification

Chicago Faucets No. 2300-8CP, polished chrome plated solid cast brass body construction with integral 10" C-C spout and 10 1/8" x 2-1/4" cover plate. 2.2 GPM pressure compensating aerator outlet. Metal lever handle with temperature limit stop and volume control. Ceramic mixing cartridge, 3 8" copper tube supply inlets. All mounting hardware is included for standard lavatory installations. This product meets ADA ANSI/ICC A117.1 requirements and is tested and certified to industry standards: ASME A112.18.1M, CSA B125.1, and Certified to NSF/ANSI 61, Section 9 by CSA.

Operation and Maintenance

Installation should be in accordance with local plumbing codes. Flush all pipes thoroughly before installation. After installation, remove spout outlet or flow control and flush faucet thoroughly to clear any debris. Care should be taken when cleaning the product. Do not use abrasive cleaners, chemicals or solvents as they can result in surface damage. Use mild soap and warm water for cleaning and protecting the life of Chicago Faucet products. For specific operation and maintenance refer to the installation instructions and repair parts documents that are located at www.chicagofaucets.com.

Chicago Faucets, member of the Geberit Group, is the leading brand of commercial faucets and fittings in the United States, offering a complete range of products for schools, laboratories, hospitals, office buildings, food service, airports and sport facilities. Call 1.800.TECTRUE or 1.847.803.5000 Option 1 for installation or other technical assistance.

2100 South Clearwater Drive
Des Plaines, IL
P: 847/803-5000
F: 847/803-5454
Technical: 800/TECTRUE
www.chicagofaucets.com
GENERAL
- Type 304 stainless steel body and removable conical basket strainer with metal ball bearing locking stem and rubber stopper
- Fits 3-1/2" (89mm) opening
- Ultra bright polished finish
- Type 304 stainless steel 1-1/2" (38mm) x 4" (102mm) tailpiece

This specification describes an Elkay product with design, quality, and functional benefits to the user. When making a comparison of other products' offerings, be certain these features are not overlooked.
CADET RIGHT HEIGHT™ ELONGATED PRESSURE-ASSISTED TOILET 1.6 gpf / 6.0 Lpf

- Vitreous china
- Low-consumption (1.6 gpf/6.0 Lpf)
- EverClean® surface inhibits the growth of stain- and odor-causing bacteria, mold, and mildew on the surface
- Bowl rim at 16-1/2" for accessible applications
- Elongated bowl
- Pressure-assisted siphon jet flush action
- Fully-glazed 2-1/8" trapway
- 10 x 12" water surface area
- Close-coupled Flushometer tank
- Metal chrome trip lever
- Speed Connect® tank/bowl coupling system
- Sanitary dam on bowl
- Two bolt caps
- 100% factory flush tested
- 12" Rough-in

- 2467.164 Same as above except with slotted rim bowl for bed pan holding (white only)
- 3483.016 Bowl with two bolt caps
- 3483.001 Same as above, Universal Bowl
- 3484.016 Bowl with slotted rim for bed pan holding with two bolt caps (white only)
- 4142.016 Tank complete with coupling components

Nominal Dimensions:
768 x 521 x 781mm
(30-1/4" x 20-1/2" x 30-3/4")

Fixture only, seat and supply by others

Recommended working pressure range
25 psi - 80 psi

Alternate Configurations Available:
- 4142.600 Tank and tank cover only with tank cover locking device
- 4142.800 Tank and tank cover only with right hand trip lever
- 4142.900 Tank complete with right hand trip lever and tank cover locking device

Compliance Certifications - Meets or Exceeds the Following Specifications:
- ASME A112.19.2-2003 / CSA B45.1-08 for Vitreous China Fixtures

To Be Specified:
- Color: □ White □ Bone □ Linen □ Black
- Seat: American Standard #5324.019 "Rise and Shine" (with easy to clean lift-off hinge system)
  solid plastic closed front seat with cover.
- American Standard #5321.110 EverClean® seat with Slow Close snap-off hinges.
- Alternate Seat:
- Supply with Stop:

© 2010 AS America Inc.
COMMERCIAL PLASTIC SEATS

MODEL 9500C

- ELONGATED SEAT, OPEN FRONT LESS COVER
- SOLID PLASTIC
- CONCEALED CHECK STAINLESS STEEL HINGES

Seats shall be No. _________ as manufactured by Church Seats. Seats shall be extra heavy weight and injection molded of solid plastic. Seats shall be open front less cover for elongated bowl and feature large molded-in bumpers. Concealed check hinges to feature 300 Series stainless steel posts that stop seat 11 degrees beyond vertical. Uses 300 Series stainless steel hardware. Color to be _________ (specify white or fixture manufacturer's color) Hinges shall be _________ (specify hinge type)

9500CC Concealed check hinge stops seat 11° beyond vertical.
9500SSCC Self-estaining, concealed stainless steel check hinge holds seat in any raised position up to 11° beyond vertical.

** ANSI Z124.5 section 5.1.2 Tests have shown that this product will support weights up to 500 pounds.** Contact Church Seat Co., for test data.

Church Seats, Sheboygan Falls, WI 53085
www.ChurchSeats.com

Phone: 920-467-2664 800-233-7328 Fax: 920-467-8573 602007 09706 2206
MADERA™ FloWise® 15” HEIGHT
1.28 GPF FLUSHOMETER TOILET
VITREOUS CHINA with EVERCLEAN®

- Floor mount flushometer valve toilet
- Vitreous china
- Meets definition for HET (High Efficiency Toilet)
- High Efficiency (4.8 Lpf/1.28 gpf)
- Will also function at 1.1gpf and 1.6gpf with a properly set dual flush valve
- EverClean® surface inhibits the growth of stain- and odor-causing bacteria, mold, and mildew on the surface
- Fully glazed 2-1/8" trapway
- Elongated bowl
- 10" or 12" roughing-in
- 15" rim height
- Condensation channel
- Powerful direct-fed siphon jet action
- 10" x 12" water surface area
- 1-1/2" inlet spud
- 2 bolt caps
- 100% factory flush tested

☐ 3451.128 Elongated bowl only, top spud
☐ 3451.001 Same as above, Universal Bowl
☐ 3452.128 Elongated bowl only, top spud with slotted rim for bedpan holding (White only)
☐ 3452.001 Same as above, Universal Bowl
☐ 3453.128 Elongated bowl only, back spud
☐ 3453.001 Same as above, Universal Bowl
☐ 3455.128 Elongated bowl only, back spud with slotted rim for bedpan holding (White only)
☐ 3455.001 Same as above, Universal Bowl

Component Parts:
☐ 047007-0070A Inlet Spud (furnished with bowl)
☐ 481310-100 Bolt caps with retainers (furnished with bowl)

Nominal Dimensions:
718 x 356 x 381mm (28-1/4" x 14" x 15")

Recommended working pressure—between 25 psi at valve when flushing and 80 psi static

Fixture only, less flushometer valve and seat

To Be Specified:
☐ Color: ☐ White ☐ Bone ☐ Linen ☐ Black
☐ Seat:
  - American Standard #5901.100 Heavy duty open front less cover
  - American Standard #5905.100 Extra heavy duty open front less cover
☐ Flushometer Valve:
  - American Standard Selectronic™ #6065.121.002 DC Power (Top Spud)
  - American Standard Selectronic™ #6065.221.007 DC Power (Back Spud)
  - American Standard Selectronic™ #6067.221.007 AC Power (Back Spud)
  - American Standard Selectronic™ #6068.221.007 Multi AC Power (Back Spud)

Compliance Certifications -
Meets or Exceeds the Following Specifications:
- ASME A112.19.2-2008 / CSA B45.1-08 for Vitreous China Fixtures

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NOTES:
PRODUCT 3451 AND 3453 SHOWN, 3452 AND 3455 SAME AS EXCEPT WITH SLOTTED RIM FOR BED PANNING.
TO COMPLY WITH AREA CODE GOVERNING THE HEIGHT OF VACUUM BREAKER ON THE FLUSHOMETER VALVE, THE PLUMBER MUST VERIFY DIMENSIONS SHOWN FOR SUPPLY ROUGHING. THIS TOILET DESIGNED TO ROUGH-IN AT A MINIMUM DIMENSION OF 204MM (8") AND A MAXIMUM DIMENSION OF 305MM (12") FROM FINISHED WALL TO CIL OF OUTLET. FLUSHOMETER VALVE NOT INCLUDED WITH FIXTURE AND MUST BE ORDERED SEPARATELY. FLUSHOMETER VALVE REQUIREMENTS FOR 12" (305MM) ROUGH-IN, SWEAT EXTENSION NIPPLE IS REQUIRED. REFER TO VALVE MANUFACTURER AND LOCAL CODES.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A12.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.
Model
ECOS
8111-1.6/1.1
Electronic Dual Flush

Description
Exposed, Battery Powered, Sensor Activated Sloan ECOS® Electronic Dual Flush Model Water Closet Flushometer for floor mounted or wall hung top spud bowls.

Flush Cycle
Full Flush (Large Button - 1.6 gpf/6.0 Lpf), Reduced Flush (Small Button - 1.1 gpf/4.2 Lpf)

Specifications
Quiet, Exposed, Diaphragm Type, Chrome Plated Closet Flushometer for either left or right hand supply with the following features:
- If the user is present for less than one minute and leaves the sensing zone or chooses the small override button, a reduced flush initiates (1.1 gpf/4.2 Lpf) eliminating liquid and paper waste, saving 1/2 gallon of water.
- If the user is present for greater than one minute and leaves the zone or chooses the large override button, the full flush initiates (1.6 gpf/6.0 Lpf) eliminating solid waste and paper waste.
- Reduces water volume by up to 30% when a reduced flush occurs.
- PERMEX® Synthetic Rubber Flex Tube Diaphragm with twin linear filtered bypass and vortex cleansing action designed for improved life and reduced maintenance.
- ADA Compliant Sloan ECOS® Electronic Dual Flush Battery Powered Infrared Sensor for automatic "No Hands" operation.
- Infrared Sensor with Multiple-focused, Lenticular Sensing Field for high and low target detection with range adjustment screw
- Latching Solenoid Operator
- Engineered Metal Cover with replaceable Lens Window
- User friendly three (3) second Flash Delay
- Courtesy Flush™ Override Button
- Four (4) Size AA Batteries factory installed
- "Low Battery" Flashing LED
- Initial Set-up Range Indicator Light (last 10 minutes)
- 1" L.P.S. Screwdriver 90° Clock Angle Stop
- Free Spinning, Vandal Resistant Stop Cap
- Adjustable Tailpiece
- High Back Pressure Vacuum Breaker Flush Connection with One-piece Bottom Hex Coupling Nut
- Spring Coupling and Flange for 1 1/2" Top Spud
- Sweat Solder Adapter with Cover Tube and Cast Steel Flange with Set Screw
- High Copper, Low Zinc Brass Castings for Dechlorination Resistance
- Fixed Metering Bypass and No External Volume Adjustment to Ensure Water Conservation
- Flush Accuracy Controlled by CID™ Technology
- Diaphragm, Stop Seat and Vacuum Breaker molded from PERMEX® Rubber Compound for Chloramine resistance

Valve Body, Tailpiece and Control Stop shall be in conformance with ASTM Alloy Classification for Semi-Rigid Brazed. Valve shall be in compliance with the applicable sections of ASSE 1037. Installation conforms to ADA requirements.

Special Finishes
- PB Polished Brass (PVD Finish)
- BN Brushed Nickel (PVD Finish)
- SF Satin Chrome

Accessories
See Accessories Section and Sloan ECOS® Electronic Dual Flush Accessories Section of the Sloan catalog for details on these and other Sloan ECOS® Electronic Dual Flush Flushometer variations.

Fixtures
Consult Sloan for Sloan brand matching fixture options.

ADA Compliant

Manual Operation
Sloan ECOS® Electronic Dual Flush Flushometers incorporate intuitive split-button design for easy manual activation. The small button controls the reduced flush cycle (1.1 gpf/4.2 Lpf), the large button controls the full flush cycle (1.6 gpf/6.0 Lpf). Straightforward graphics alert user to proper activation. The reduced flush for liquid waste or full flush for solid waste. To further educate the user, two (2) Instructional wall plates are included with each Sloan ECOS® Flushometer.

Automatic Operation
Sloan ECOS® Electronic Dual Flush Flushometers can also be activated via multi-functional infrared sensor. By detecting user presence and duration, the Sloan ECOS® Smart Sense Technology will determine the proper flush volume for unequilibrated water efficiency.

Functional & Hygienic
Touchless, sensor operation eliminates the need for user contact to help control the spread of infectious diseases. The Sloan ECOS® Electronic Dual Flush Flushometers are provided with Reduced or Full Flush Override Buttons to allow a "courtesy flush" for individual user comfort.

Warranty
3 year (limited)

Patented
DS68,976

The information contained in this document is subject to change without notice.
**ECOS**

**8111-1.6/1.1**

Electronic Dual Flush

- **Description**
  Exposed, Battery Powered, Sensor Activated Sloan ECOS* Electronic Dual Flush Model Water Closet Flushometer for floor mounted or wall hung top spud bowls.

- **Flush Cycle**
  Full Flush (Large Button – 1.6 gpf/6.0 Lpf), Reduced Flush (Small Button – 1.1 gpf/4.2 Lpf)

---

**ELECTRICAL SPECIFICATIONS**

- **Control Circuit**
  Solid State
  8 VDC Input
  8 Second Arming Delay
  3 Second Flush Delay

- **Sloan ECOS* Dual Flush Sensor Type**
  Active Infrared

- **Sloan ECOS* Dual Flush Sensor Range**
  Nominal 22" - 42" (559 mm - 1067 mm), Adjustable ± 6" (152 mm)

- **Battery Type**
  Four (4) AA Alkaline

- **Battery Life**
  Three (3) Years @ 4,000 Flushes/Month

- **Indicator Lights**
  Range Adjustment/Low Battery

- **Operating Pressure**
  15 - 100 psi (104 - 689 kPa)

- **Sanitary Flush**
  Once Every 72 Hours After the Last Flush

---

**OPERATION**

1. A continuous, invisible light beam is emitted from the Sloan ECOS* Dual Flush Sensor.

2. As the user enters the beam's effective range, 22" to 42" (559 mm to 1067 mm), the beam is reflected into the Scanner Window to activate the Output Circuit. Once activated, the Output Circuit continues in a "hold" mode for as long as the user remains within the effective range of the sensor. If the user stays longer than 65 seconds, a full flush will automatically initiate when the user leaves.

3. Once a user is detected, if the user leaves in 65 seconds or less, a reduced flush will automatically initiate. The circuit automatically resets and is ready for the next user.

---

**VALVE ROUGH-IN**

Model 8111

When installing the Sloan ECOS* Electronic Dual Flush in a handicap stall:
Per the ADA Guidelines (section 604.9.4) it is recommended that the grab bars be split or shifted to the wide side of the stall.

---

SLOAN VALVE COMPANY • 10500 SEYMOUR AVENUE • FRANKLIN PARK, IL 60131

Phone: 1-800-9-VALVE-9 or 1-847-671-4300 • Fax: 1-800-447-8329 or 1-847-671-4380 • www.sloanvalve.com

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Sloan ECOS* Electronic Dual Flush 8111-1.6/1.1 S.S. — Rev. 04 (03/10)
COMMERCIAL PLASTIC SEATS

MODEL 9500C

- ELONGATED SEAT, OPEN FRONT LESS COVER
- SOLID PLASTIC
- CONCEALED CHECK STAINLESS STEEL HINGES

Seats shall be No. ______ as manufactured by Church Seats. Seats shall be extra heavy weight and injection molded of solid plastic. Seats shall be open front less cover for elongated bowl and feature large molded-in bumpers. Concealed check hinges to feature 300 Series stainless steel posts that stop seat 11 degrees beyond vertical. Uses 300 Series stainless steel hardware. Color to be ________ (specify white or fixture manufacturer’s color). Hinges shall be _________. (specify hinge type)

9500C Concealed check hinge stops seat 11° beyond vertical.
96005SC Self-sustaining, concealed stainless steel check hinge holds seat in any raised position up to 11° beyond vertical.

** ANSI Z124.5 section 5.1.2 Tests have shown that this product will support weights up to 500 pounds.** (Contact Church Seat Co., for test data)
LUCERNE™ WALL-HUNG LAVATORY

- Wall-hung sink
- Vitreous china
- Front overflow
- D-shaped bowl
- Self-draining deck area with contoured back and side splash shields
- Faucet ledge

Faucet holes on 203mm (8") centers (Illus.):
- 0356.028 For exposed bracket support
  Shown with 4801.862 Amarilis Heritage faucet with Triune Cross handles (not included)
- 0356.015 For wall hanger (included) or concealed arms support
- 0356.037 For wall hanger (included) or concealed arms support
  • Extra right-hand hole
- 0356.073 For wall hanger (included) or concealed arms support
  • Extra left-hand hole

Faucet holes on 102mm (4") centers:
- 0355.027 For exposed bracket support
- 0355.012 For wall hanger (included) or concealed arms support
- 0355.034 For wall hanger (included) or concealed arms support
  • Extra right-hand hole
- 0355.056 For wall hanger (included) or concealed arms support
  • Extra left-hand hole

Single center faucet hole (Illus.):
- 0355.041 For exposed bracket support
  Shown with 1340.000 metering faucet (not included)
- 0356.421 For wall hanger (included) or concealed arms support
- 0356.137 For wall hanger (included) or concealed arms support
  • Extra right-hand hole
- 0356.115 For wall hanger (included) or concealed arms support
  • Extra left-hand hole

Nominal Dimensions:
521 x 464mm
(20-1/2" x 18-1/4")

Bowl sizes:
361mm (15") wide
254mm (10") front to back
165mm (6-1/2") deep

Compliance Certifications -
Meets or Exceeds the Following Specifications:
• ASME A112.19.2 for Vitreous China Fixtures

SEE REVERSE FOR ROUGHING-IN DIMENSIONS

To Be Specified:
- Color: White Bone Silver Black Linen
- Faucet:
  - Faucet Finish:
  - Supplies:
  - 1-1/4" Trap:
  - Nipple:
  - Bracket Support (by others):
  - Concealed Arms Support (by others):

* See faucet section for additional models available

MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES - CHECK LOCAL CODES.
Top of front rim mounted 864mm (34") from finished floor.
0355.012 4" CTRS FOR WALL HANGER OR CONCEALED ARMS

0355.034 4" CTRS FOR WALL HANGER OR CONCEALED ARMS EXTRA RIGHT HAND HOLE

0355.056 4" CTRS FOR WALL HANGER OR CONCEALED ARMS EXTRA LEFT HAND HOLE

NOTES:
- DIMENSIONS SHOWN FOR LOCATION OF SUPPLIES AND "P" TRAP ARE SUGGESTED.
- PROVIDE SUITABLE REINFORCEMENT FOR ALL WALL SUPPORTS, FITTINGS NOT INCLUDED AND MUST BE ORDERED SEPARATELY.
- CONCEALED ARM SUPPORT AS REQUIRED TO BE FURNISHED BY OTHERS.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.10.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.

LAVATORY DESIGNED TO MEET ADA HANDICAPPED GUIDELINES WITH MOUNTING HEIGHT SET AT 864MM (34") ABOVE FINISHED FLOOR.
0356.421 SINGLE CENTER HOLE FOR WALL HANGER OR CONCEALED ARMS

0356.137 SINGLE CENTER HOLE FOR WALL HANGER OR CONCEALED ARMS WITH EXTRA RIGHT HAND HOLE

0356.115 SINGLE CENTER HOLE FOR WALL HANGER OR CONCEALED ARMS WITH EXTRA LEFT HAND HOLE

NOTES:
* DIMENSIONS SHOWN FOR LOCATION OF SUPPLIES AND 1" TRAP ARE SUGGESTED.
* PROVIDE SUITABLE REINFORCEMENT FOR ALL WALL SUPPORTS, FITTINGS NOT INCLUDED AND MUST BE ORDERED SEPARATELY, CONCEALED ARM SUPPORT AS REQUIRED TO BE FURNISHED BY OTHERS.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.

LAVERATORY DESIGNED TO MEET ADA HANDICAPPED GUIDELINES WITH MOUNTING HEIGHT SET AT 864MM (34") ABOVE FINISHED FLOOR.

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ELECTRONIC FAUCETS
116.606.AB.1

Single Hole or 4" Centers, Deck Mount, Electronic Lavatory Faucet with Dual Beam Infrared Sensor

Product Type
Single Hole or 4" Centers, Deck Mount, Electronic Lavatory Faucet with Dual Beam Infrared Sensor

Features & Specifications
• 5 3/8" C-C Spout
• 0.5 GPM (1.9 L/min) Vandal Resistant Spray Outlet
• 6 Volt Lithium CR2 Battery (Included)
• Multiple Field Adjustable Modes and Ranges
• Geberit Commander Software Compatible
• ECAST® design provides durable brass construction with total lead content equal to or less than 0.25% by weighted average

Performance Specification
• Rating Operating Pressure: 20-125 PSI
• Rated Operating Temperature: 40-140°F

Warranty
• Lifetime Limited Faucet Warranty
• 5-Year Limited Faucet Warranty
• 1-Year Limited Finish Warranty
• 5-Year Limited Mechanical Warranty
• 3-Year Limited Electronics and Solenoid Warranty

Codes & Standards
• ASME A112.18.1M
• CSA B125.1
• Certified to NSF/ANSI 61, Section 9 by CSA
• California Health and Safety Code 118875 (AB1953-2006)
• Vermont Bill S.152
• ADA ANSI/ICC A117.1

ECAST
ECAST products are intended for installation where state laws and local codes mandate lead content levels or in any location where lead content is a concern.
Single Hole or 4" Centers, Deck Mount, Electronic Lavatory Faucet with Dual Beam Infrared Sensor

Architect/Engineer Specification
Chicago Faucets No. 116.606.21.1, Polished chrome plated metal construction. 6V Lithium CR-P2 battery (included). Low battery indicator. Metal spout with .5 GPM vandal resistant spray outlet. Multiple field adjustable modes and ranges. Above deck hermetically sealed electronics module and solenoid with filter screen. 1/2" NPSM brass shank with filter screen. Geberit CommanderTM software compatible. Mounting hardware included. This product meets ADA ANSI/ICC A117.1 requirements and is tested and certified to industry standards: ASME A112.18.1M, CSA B125.1, Certified to NSF/ANSI 61, Section 9 by CSA, California Health and Safety Code 118875 (AB1953-2006), and Vermont Bill S.152.

Operation and Maintenance
Installation should be in accordance with local plumbing codes. Flush all pipes thoroughly before installation. After installation, remove spout outlet or flow control and flush faucet thoroughly to clear any debris. Care should be taken when cleaning the product. Do not use abrasive cleaners, chemicals or solvents as they can result in surface damage. Use mild soap and warm water for cleaning and protecting the life of Chicago Faucet products. For specific operation and maintenance refer to the installation instructions and repair parts documents that are located at www.chicagofaucets.com.

Chicago Faucets, member of the Geberit Group, is the leading brand of commercial faucets and fittings in the United States, offering a complete range of products for schools, laboratories, hospitals, office buildings, food service, airports and sport facilities. Call 1.800.TECTRUE or 1.847.603.5000 Option 1 for installation or other technical assistance.
MANUAL FAUCETS

337-CP

Grid Strainer Offset Waste

Product Type
Grid Strainer Offset Waste

Features & Specifications
* 1 1/4" O.D. Tailpiece

Warranty
* Lifetime Limited Faucet Warranty
* 5-Year Limited Cartridge Warranty
* 1-Year Limited Finish Warranty

Codes & Standards
* CSA B125.2

Job Name ________________________________

Item Number ____________________________

Section/Tag _____________________________

Model Specified _________________________

Architect ______________________________

Engineer _______________________________

Contractor _____________________________

[ ] Submitted as Shown [ ] Submitted with Variations

Date _________________________________
337-CP
Grid Strainer Offset Waste

Operation and Maintenance
Installation should be in accordance with local plumbing codes. Flush all pipes thoroughly before installation. After installation, remove spout outlet or flow control and flush faucet thoroughly to clear any debris. Care should be taken when cleaning the product. Do not use abrasive cleaners, chemicals or solvents as they can result in surface damage. Use mild soap and warm water for cleaning and protecting the life of Chicago Faucet products. For specific operation and maintenance refer to the installation instructions and repair parts documents that are located at www.chicagofaucets.com.

Chicago Faucets, member of the Geberit Group, is the leading brand of commercial faucets and fittings in the United States, offering a complete range of products for schools, laboratories, hospitals, office buildings, food service, airports and sport facilities. Call 1.800.TECTRUE or 1.847.803.5000 Option 1 for installation or other technical assistance.
LAVATORY SUPPORTS
WITH CONCEALED ARMS

FLOOR MOUNTED WITH "PRO-SET" UPRIGHTS

For High Back Lavatories (shown)
Fig. 0700........FOR BACK-TO-BACK SUPPORT

For Flat Slab Lavatories (shown)
Fig. 0700D (-E).....FOR BACK-TO-BACK SUPPORT

NOTE: For metal stud wall construction, specify Suffix M31 rectangular steel upright with welded base for greater strength.
For lettered dimensions, contact factory.

FLOOR MOUNTED WITH RECTANGULAR 1 X 3 "PRO-SET" UPRIGHTS

For High Back Lavatories (shown)
Fig. 0700 (-M31)........FOR BACK-TO-BACK SUPPORT

For Wheelchair Lavatories (shown)
Fig. 0700D (-27-M31).....FOR BACK-TO-BACK SUPPORT

For lettered dimensions, contact factory.

FLOOR MOUNTED WITH LABOR SAVER® UPRIGHT

For High Back Lavatories (shown)
Fig. 0710........FOR BACK-TO-BACK SUPPORT

For Flat Slab Lavatories (shown)
Fig. 0710D (-E).....FOR BACK-TO-BACK SUPPORT

For lettered dimensions, contact factory.
Aquatic products may be specified as Lasco Bathware.

Submittal Sheet
ADA Compliant 2603SMTE

CUSTOMER: ____________________________

PO #: ________________________________

QUOTE #: ____________________________ QUANTITY: ______

PLUMBING CONTRACTOR APPROVAL: ________ DATE: ________

ENGINEER APPROVAL: ________ DATE: ________

To complete your order, this document must be signed and faxed to the Aquatic Centralized Customer Service Center.
Fax (866) 544-5353 • Phone (800) 945-2726

IMPORTANT: ADA compliant showers with NO interior threshold will have water escape onto the bathroom floor.
Aquatic highly recommends you take the following precautions:
1. Install only the minimum number of ADA units without an interior threshold required for each job.
   If possible install Aquatic's accessible models that have a 1/4 (15) interior threshold to reduce the amount of water that escapes from the shower.
2. When installing units with NO interior threshold, install a FLOOR DRAIN to control the water that escapes onto the bathroom floor.
3. Depending on your application, you may choose to install Aquatic's vinyl flexible dam or removable threshold, which helps better contain water within the shower.
   However, these items may not necessarily meet ADA or other code requirements. Always confirm code compliance with your local building authority.

### STANDARD FEATURES

- Code compliant when fully equipped and installed according to guidelines
- Extra wide tub
- Integral toiletry shelves
- LH or RH drain location
- Slip resistant, textured bottom [ASTM F-462]

### CONFIGURATION

- Fully equipped — ADA
- Includes 24 (610) grab bars, trifold removable seat, pressure balancing mixing valve and hand-held shower assembly per ADA guidelines

### ADDITIONAL OPTIONS

- Fixture Wall: ☐ Left ☐ Right
- Grab bars
  - ☒ Stainless Steel ☐ Powder-Coated White
  - ☒ Teakwood finish fold-up seat
  - ☐ Hand-held shower assembly with 24 (610) slide bar and 60 (1525) hose
  - ☐ Pressure balancing mixing valve
  - ☐ Curtain rod
  - ☐ Shower curtain
- Standard Colors: ☐ Almond ☐ Biscuit
  - ☐ Bone ☐ Linen ☐ White ☐ Stainless Silver
  - ☐ Other
- ☒ Brass drain
- ☐ Additional accessories

For pricing of units and additional options, reference the Aquatic Price Book.

Rev. 01/04/11

Please indicate custom changes on reverse side drawings.

123
DESCRIPTION
- Chrome plated metal construction
- Pressure balancing cycle valve design with 1/4 turn stops
- 3 function transfer valve
- 1/2" CC connections
- Contains stationary showerhead, hand-held shower, 69" metal hose, 30" slide bar, drop ell, vacuum breaker and tub filler
- Slide bar is NOT DESIGNED TO BE A GRAB BAR
- Applicable components are supplied with vandal resistant screws

OPERATION
- Temperature and transfer valves both have ADA compliant lever style handles
- Temperature handle operates counterclockwise through a 270° arc with off at 6 o'clock, and the maximum hot at the 9 o'clock position
- Adjustable temperature limit stop
- Pressure balancing mechanism maintains selected discharge temperature to ±2°
- Transfer valve operates 3 distinct functions

FLOW
- 2.5 gpm (9.5L/min) hand-held shower and stationary shower head

CARTRIDGE
- 1222 cartridge design in temperature control valve accommodates back to back installations
- Ceramic disc cartridge in transfer valve

STANDARDS
- Third party certified to ASME A112.18.1/C5A B125.1 and all applicable requirements referenced therein including ASSE 1016
- ADA for lever handle

WARRANTY
- Warranted for 5 years against material or manufacturing defects

NOTE: This valve is not intended to be used as a shut-off valve. To prevent the potential of cross flow, check valves must be integral to the supply valve or installed in both hot and cold water supply lines.

CRITICAL DIMENSIONS

(DO NOT SCALE)

FOR P15

Specifications

Three-Function Commercial
Tub/Shower System

Model: 8343

MOEN SPECIFIER SERVICES 1-800-321-8809 Ext. 2158
www.moen.com

Rev. 3/10
Specifications

DESCRIPTION
- Handheld shower
- High impact chrome plated plastic
- Quick cleaning rubber nozzles

OPERATION
- Single spray pattern

FLOW
- Designed to deliver 1.6 gpm (6.1L/min) max

STANDARDS
- Third party certified to ASME A112.18.1/CSA B125.1,
  ICC A117.1 and all applicable requirements referenced therein

WARRANTY
- 5 year limited warranty

Single Function Handheld Shower

Model: 8349LF16

CRITICAL DIMENSIONS

(Do Not Scale)

For P15
DESCRIPTION
- Fixed mount vandal resistant showerhead
- Chrome plated, metal construction
- Brass swivel ball assembly
- Vandal resistant set screws

FLOW
- Designed to deliver 1.5 gpm (5.7 L/min) maximum at 80 psi,
1.1 gpm (4.2 L/min) minimum at 45 psi
36 self cleaning spray forms

STANDARDS
- Designed and manufactured to comply with the requirements of: ASME A112.18.1/CSA B125.1 and all requirements referenced therein

WARRANTY
- Warranted for 5 year against material or manufacturing defects

Specifications

Single Function Low-Flow Showerhead

Model: 52716EP15

CRITICAL DIMENSIONS

FOR MORE INFORMATION CALL: 1-800-BUY-MOEN
www.moen.com
MADERA™ FloWise® 16-1/2" HEIGHT
1.28 GPF FLUSHOMETER TOILET
VITREOUS CHINA with EVERCLEAN®

BARRIER FREE

MADERA™ FloWise® 16-1/2" HEIGHT with EVERCLEAN®

- Floor mount flushometer valve toilet
- Vitreous china
- Meets definition for HET (High Efficiency Toilet)
- High Efficiency (4.8 Lpf/1.28 gpf)
- Will also function at 1.1gpf and 1.6gpf with a properly set dual flush valve
- EverClean® surface inhibits the growth of stain- and odor-causing bacteria, mold, and mildew on the surface
- 10" or 12" roughing-in
- 16-1/2" rim height for accessible application
- Condensation channel
- Elongated bowl
- Powerful direct-fed siphon jet action
- Fully glazed 2-1/6" trapway
- 10" x 12" water surface area
- 1-1/2" top spud
- 2 bolt caps
- 100% factory flush tested

☐ 3461.128 Elongated bowl only, top spud
☒ 3461.001 Same as above, Universal Bowl
☐ 3462.128 Elongated bowl only, top spud with slopped rim for bedpan holding (White only)
☐ 3462.001 Same as above, Universal Bowl
☐ 3465.128 Elongated bowl only, top spud with 4 bolts
☐ 3465.001 Same as above, Universal Bowl
☐ 3466.128 Elongated bowl only, top spud with slopped rim for bedpan holding with 4 bolts (White only)
☐ 3466.001 Same as above, Universal Bowl
☐ 3463.128 Elongated bowl only, back spud
☐ 3463.001 Same as above, Universal Bowl
☐ 3464.128 Elongated bowl only, back spud with slopped rim for bedpan holding (White only)
☐ 3464.001 Same as above, Universal Bowl

Component Parts:
☐ 047007-0070A Inlet spud (furnished with bowl)
☐ 481310-100 Bolt cap with retainers (furnished with bowl)

Nominal Dimensions:
718 x 356 x 419mm (28-1/4" x 14" x 16-1/2")

Recommended working pressure—between 25 psi at valve when flushing and 80 psi static

Fixture only, less seat and flushometer valve

Compliance Certifications -
Meets or Exceeds the Following Specifications:
- ASME A112.19.2-2008 / CSA B45.1-08 for Vitreous China Fixtures

SEE REVERSE FOR ROUGHING-IN DIMENSIONS

To Be Specified:
☐ Color: ☐ White ☐ Bone ☐ Linen ☐ Black
☐ Seat:
  ☐ American Standard #5901.100 Heavy duty open front less cover
  ☐ American Standard #5905.100 Extra heavy duty open front less cover
☐ Flushometer Valve:
  ☐ American Standard Selectronic™ #6065.121.002 DC Power (Top Spud)
  ☐ American Standard Selectronic™ #6065.221.007 DC Power (Back Spud)
  ☐ American Standard Selectronic™ #6067.221.007 AC Power (Back Spud)
  ☐ American Standard Selectronic™ #6068.221.007 Multi AC Power (Back Spud)

MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND ANSI A117.1 REQUIREMENTS FOR ACCESSIBLE AND USABLE BUILDING FACILITIES - CHECK LOCAL CODES.

EVERCLEAN® Surface
WATER EFFICIENT PROJECT

© 2010 AS America Inc.

M67
Revised 4/10
MADERA™ FloWise® 16-1/2" HEIGHT 1.28 GPF FLUSHOMETER TOILET
VITREOUS CHINA with EVERCLEAN®

3461.128/3462.128/3465.128/3466.128
3461.001/3462.001/3465.001/3466.001

NOTES:
PRODUCT 3461 AND 3463 SHOWN, 3462 AND 3466 SAME AS EXCEPT WITH SLOTTED RIM FOR BED PAN HOLDING.
TO COMPLY WITH AREA CODE GOVERNING THE HEIGHT OF VACUUM BREAKER ON THE FLUSHOMETER VALVE, THE PLUMBER MUST VERIFY DIMENSIONS SHOWN FOR SUPPLY ROUGHING.
THIS TOILET DESIGNED TO ROUGH-IN AT A MINIMUM DIMENSION OF 254MM (10") AND A MAXIMUM DIMENSION OF 305MM (12") FROM FINISHED WALL, TO COIL OF OUTLET. FLUSHOMETER VALVE NOT INCLUDED WITH FIXTURE AND MUST BE ORDERED SEPARATELY. FLUSHOMETER VALVE REQUIREMENTS FOR 12" (305MM) ROUGH-IN; SWEAT EXTENSION NIPPLE IS REQUIRED. REFER TO VALVE MANUFACTURER AND LOCAL CODES.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.

© 2010 AS America Inc.
SLOAN ECOS
8111-1.6/1.1
Electronic Dual Flush

Description
Exposed, Battery Powered, Sensor Activated Sloan ECOS™ Electronic Dual Flush Model

Flush Cycle
Full Flush (Large Button – 1.6 gal/6.0 Lpf), Reduced Flush (Small Button – 1.1 gal/4.2 Lpf)

Specifications
Quiet, Exposed, Diaphragm Type, Chrome Plated Closet Flushometer for either left or right hand supply with the following features:
- If the user is present for less than one minute and leaves the sensing zone or chooses the small override button, a reduced flush initiates (1.1 gal/4.2 Lpf) eliminating liquid and paper waste, saving 1/2 gallon of water.
- If the user is present for greater than one minute and leaves the zone or chooses the large override button, the full flush initiates (1.6 gal/6.0 Lpf) eliminating solid waste and paper waste.
- Reduces water volume by up to 30% when a reduced flush occurs.
- PERMEX™ Synthetic Rubber Flex Tube Diaphragm with twin linear filtered bypass and water cleaning action designed for improved life and reduced maintenance.
- ADA Compliant: Sloan ECOS™ Electronic Dual Flush Battery Powered Infrared Sensor for automatic "No Hands" operation.

Infrared Sensor with Multiple-focused, Tubular Sensing Fields for high and low target detection with range adjustment screw.
- Latching Solenoid Operator
- Engineered Metal Cover with replaceable Lens Window
- User friendly three (3) seconds flush delay
- Courtesy Flush™ Override Button
- Four (4) Size AA Batteries factory installed
- "Low Battery" Flashing LED
- Initial Set-up Range Indicator Light (first 10 minutes)
- 1/4" I.P.S. Screwdriver Backup-Chok™ Angle Stop
- Free Spinning, Vandal Resistant Stop Cap
- Adjustable Tappiece
- High Back Pressure Vacuum Breaker Flange with One-piece Bottom Hex Coupling Nut
- Sprig Coupling and Flange for 1½" Top Spud
- Sweat Solder Adapter with Cover Tube and Cast Wall Flange with Set Screw
- High Copper, Low Zinc Brass Castings for Dendriticfree Resistance
- Fixed Metering Bypass and No External Volume Adjustment to Ensure Water Conservation
- Flush Accuracy Controlled by CID™ Technology
- Diaphragm, Stop Seat and Vacuum Breaker molded from PERMEX™ Rubber Compound for Chloramine Resistance

Valve Body, Tappiece and Control Stop shall be in conformance with ASTM Alloy Classification for Semi-Red Brass. Valve shall be in compliance with the applicable sections of ASSE 1037. Installation conforms to ADA requirements.

Special Finishes
- PB Polished Brass (PVD Finish)
- BN Brushed Nickel (PVD Finish)
- SF Satin Chrome

Accessories
See Accessories Section and Sloan ECOS™ Electronic Dual Flush Accessories Section of the Sloan catalog for details on those and other Sloan ECOS™ Electronic Dual Flush Flushometer variations.

Fixtures
Consult Sloan for Sloan brand matching fixture options.

ADA Compliant

Manual Operation
Sloan ECOS™ Electronic Dual Flush Flushometers incorporate intuitive split-button design for easy manual activation. The small button controls the reduced flush cycle (1.1 gal/4.2 Lpf), the large button controls the full flush cycle (1.6 gal/6.0 Lpf). Straightforward graphics alert user to proper activation. The reduced flush for liquid waste or full flush for solid waste. To further educate the user, two (2) instructional wall plates are included with each Sloan ECOS™ Flushometer.

Automatic Operation
Sloan ECOS™ Electronic Dual Flush Flushometers can also be activated via multi-labeled infrared sensor. By detecting user presence and duration, the Sloan ECOS™ Smart Sense Technology™ will determine the proper flush volume for unequipped water efficiency.

Functional & Hygienic
Touchless, sensor operation eliminates the need for user contact to help control the spread of infectious diseases. The Sloan ECOS™ Electronic Dual Flush Flushometers are provided with Reduced or Full Flush Override Buttons to allow a "courtesy flush" for individual user comfort.

Warranty
3 year (limited)

Patented
07589,976

This space for Architect/Engineer approval

Job Name ____________________ Date ____________________
Model Specified ____________________ Quantity ____________________
Specifications ____________________
Customer/Wholesaler ____________________
Contractor ____________________
Architect ____________________

Sloan ECOS™ Electronic Dual Flush 8111-1.6/1.1 S.S.—Rev. 0d (03/10)

The information contained in this document is subject to change without notice.
ECOS
8111-1.6/1.1
Electronic Dual Flush

Description
Exposed, Battery Powered, Sensor Activated Sloan ECOS® Electronic Dual Flush Model Water Closet Flushometer for floor mounted or wall hung top spud bowls.

Flush Cycle
Full Flush (Large Button – 1.6 gpf/6.0 Lp), Reduced Flush (Small Button – 1.1 gpf/4.2 Lp)

Electrical Specifications
- Control Circuit
  - Solid State
  - 6 VDC Input
  - 8 Second Aiming Delay
  - 3 Second Flush Delay
- Sloan ECOS® Dual Flush Sensor Type
  - Active Infrared
- Sloan ECOS® Dual Flush Sensor Range
  - Nominal 22° - 42° (559 mm - 1067 mm)
  - Adjustable ± 8° (203 mm)
- Battery Type
  - Four (4) AA Alkaline
- Battery Life
  - Three (3) Years @ 4,000 Flushing/Month
- Indicator Lights
  - Range Adjustment/low Battery
- Operating Pressure
  - 15 - 100 psf (104 - 689 kPa)
- Sentinel Flash
  - Once Every 72 Hours After the Last Flush

Operation
1. A continuous, invisible light beam is omitted from the Sloan ECOS® Dual Flush Sensor.
2. As the user enters the beam's effective range, 22° to 42° (559 mm to 1067 mm), the beam is reflected into the Scanner Window to activate the Output Circuit. Once activated, the Output Circuit continues in a "hold" mode for as long as the user remains within the effective range of the sensor. If the user stays longer than 65 seconds, a full flush will automatically initiate when the user leaves.
3. Once a user is detected, if the user leaves in 65 seconds or less, a reduced flush will automatically initiate. The circuit automatically resets and is ready for the next user.

Valve Rough-In
Model 8111

When installing the Sloan ECOS® Electronic Dual Flush in a handicapped stall:
For the ADA Guidelines (section 804.9.4) it is recommended that the grab bars be split or shifted to the wide side of the stall.

Sloan Valve Company • 10500 Seymour Avenue • Franklin Park, IL 60131
Phone: 1-800-9-VALVE-9 or 1-847-671-4300 • Fax: 1-800-447-8329 or 1-847-671-4380 • www.sloanvalve.com

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COMMERCIAL PLASTIC SEATS

MODEL 9500C

- ELONGATED SEAT, OPEN FRONT LESS COVER
- SOLID PLASTIC
- CONCEALED CHECK STAINLESS STEEL HINGES

Seats shall be No. __________ as manufactured by Church Seats. Seats shall be extra heavy weight and injection molded of solid plastic. Seats shall be open front less cover for elongated bowl and feature large molded-in bumpers. Concealed check hinges to feature 300 Series stainless steel posts that stop seat 11 degrees beyond vertical. Uses 300 Series stainless steel hardware. Color to be __________ (specify white or fixture manufacturer's color) Hinges shall be __________ (specify hinge type).

9500C Concealed check hinge stops seat 11° beyond vertical.
9500CSSC Self-sustaining, concealed stainless steel check hinge holds seat in any raised position up to 11° beyond vertical.

** ANSI Z124.5 section 5.1.2 Tests have shown that this product will support weights up to 500 pounds.**

Contact Church Seat Co., for test data.
**FLOOR OR SHOWER DRAINS**

**WITH ADJUSTABLE STRAINER HEADS**

**FUNCTION:** General service floor drain for use in showers, toilets, kitchens and other finished areas where foot traffic is expected. The round top strainer head is used for all types of poured finished floors. The square top is particularly adaptable to floors that are finished in material of square or straight line pattern. Reversible flashing collar permits adjustment of the strainer to meet finished floor level.

---

**NO-HUB OUTLET**

- **Fig. 2005Y....-(A) ROUND TOP**
- **Fig. 2005Y....-(B) SQUARE TOP**

<table>
<thead>
<tr>
<th>Outlet Size</th>
<th>Nickel Bronze Strainer Head</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø02(50)</td>
<td>Ø05(125) DIA or SQ</td>
</tr>
<tr>
<td>Ø03(75)</td>
<td>Ø06(150) DIA or SQ</td>
</tr>
<tr>
<td>Ø04(100)</td>
<td>Ø06(205) DIA or SQ</td>
</tr>
</tbody>
</table>

---

**SPEEDI-SET OUTLET**

- **Fig. 2005L....-(A) ROUND TOP**
- **Fig. 2005L....-(B) SQUARE TOP**

<table>
<thead>
<tr>
<th>Strainer Size</th>
<th>&quot;Collar in High Position&quot; ØXX MAX</th>
<th>&quot;Collar in Low Position&quot; ØXX Min</th>
<th>Free Area SQ CM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø05(125)</td>
<td>1&quot;4(32) 1.9(48) 3.4(90) 1.58(41) 6.5(2)</td>
<td></td>
<td>7(45) 6.5(2)</td>
</tr>
<tr>
<td>Ø06(150)</td>
<td>1&quot;4(32) 1.9(48) 3.4(90) 1.58(41) 8(60) 13(80)</td>
<td></td>
<td>17(110) 14(80)</td>
</tr>
<tr>
<td>Ø07(180)</td>
<td>1&quot;4(32) 2.1(52) 3.4(90) 1.58(41) 8(60) 13(80)</td>
<td></td>
<td>17(110) 14(80)</td>
</tr>
<tr>
<td>Ø09(220)</td>
<td>1&quot;5(38) 2.1(52) 3.3(80) 3(78) 17(110) 4(30)</td>
<td></td>
<td>16(100)</td>
</tr>
<tr>
<td>Ø10(255)</td>
<td>1&quot;5(38) 2.3(60) 3.3(80) 3(78) 17(110) 4(30)</td>
<td></td>
<td>16(100)</td>
</tr>
</tbody>
</table>

---

**REGULARLY FURNISHED:**

Doeco Cast Iron Body with Flushing Collar and Adjustable Strainer Head as indicated by Suffix Letter Selected.

**NOTE:** Dimensions shown in parentheses are in millimeters.

- Ø02(50), Ø03(75) or Ø04(100) sizes only.

---

**VARIATIONS:**

- Flapper Type Backwater Valve -V
- Hinged Grate -H
- Speedi-Set Service Weight 2(50), 3(75) & 4*(100) only
- L: Speedi-Set Extra Heavy 2(50), 3(75) & 4*(100) only
- XH: Speedi-Set Extra Heavy 2(50), 3(75) & 4*(100) only
- Sediment Bucket -B
- Trap Primer Connection -PO50 1/2" (13) & -P075 3/4" (19)
- Vandal Proof Screws -U
- Wide Flanged Strainer (Specify Fig. DX2000)
- T: Threaded Outlet

---

**OPTIONAL MATERIALS:**

- Bronze Body -BB
- Chrome Plated Strainer -CP
- Galvanized Cast Iron Body -G
- Nickel Bronze Strainer -NB
- Polished Bronze Strainer -PB
- Stainless Steel (Specify Fig. 9700-A)

SEE PM0457 FOR OPTIONAL STRAINER HEADS.

**FIGURE NUMBER: 2005**
FUNNEL-CEPTOR® INDIRECT WASTE DRAINS WITH ADJUSTABLE STRAINER HEADS

FUNCTION: Used to receive waste water from indirect waste lines. Exposed grate surrounding funnel serves as drain for surrounding floor area. Adjustable strainer heads permit accurate positioning to meet finished floor level.

BOTTOM OUTLET

Strainer Size: 05(125), 06(150), 07(180) or 08(205) (Round Or Square)
Reversible Flashing Collar

SIDE OUTLET

1 1/4 (32) MIN
2 1/4 (57) MAX

Fig. 3510C... CAULK OUTLET
Fig. 3510T... THREADED OUTLET
Fig. 3510Y... NO-HUB OUTLET

A SIZE: 02 (50), 03 (80), 04 (100)
B: 4 (100) for Caulk, NO-HUB and Speedi-Set 3 (76) for Threaded

NOTE: Dimensions shown in parentheses are in millimeters.

**Min 6 3/4 (170) hole required for core drilled application

REGULARLY FURNISHED:
Duco Cast Iron Body and Flashing Collar with Adjustable Strainer Head with Secured Square Hole Grate and Funnel attached to the grate with concealed screws, permitting funnel to be moved to different positions on the grate. Type of Body and Strainer Head as indicated by Figure Number and Strainer Suffix Letter Selected.

SEE PM2789A FOR OPTIONAL STRAINER HEADS

VARIATIONS:

BODY:
L Speedi-Set Service Weight (Fig. 3510 only)
LXH Speedi-Set Extra Heavy (Fig. 3510 only)
Trap Primer Connection -P05 (1/2") -P075 (3/4")

STRAINER HEAD:
Backwater Valve -V
Ball Float Backwater Valve -BFV
Sediment Bucket -B
Vandal Proof Grate -U
6" (150) Dia. Funnel (Fig. 3581)
6(160) x 2 1/2(64) x 1"(25) High Oval Funnel (Fig. 3590)

OPTIONAL MATERIALS:
Cast Bronze Body -BB
Chrome Plated Strainer -CP
Galvanized Body -G
Nickel Bronze Strainer -NB
Polished Bronze Strainer -PB

NOTES: All strainer shanks have 3 3/4" (35) -12 Thd. Collar not reversible in 4" (100) size.

* Deduct 1/2" (13) when collar is inverted.
Add 1/4" (6) for 8" (205) strainer

<table>
<thead>
<tr>
<th>Strainer Size</th>
<th>Collar In High Position</th>
<th>Collar In Low Position</th>
<th>Free Area SQ IN (SQ CM)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MIN</td>
<td>MAX</td>
<td>MIN</td>
</tr>
<tr>
<td>05(125)</td>
<td>1 1/4 (32)</td>
<td>2 1/4 (57)</td>
<td>3/4 (19)</td>
</tr>
<tr>
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<td>08(205)</td>
<td>1 1/2 (38)</td>
<td>2 1/2 (64)</td>
<td>1 (25)</td>
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QUARTERHORSE
1/4 TURN NON-FREEZE WALL HYDRANT WITH INTEGRAL VACUUM BREAKER AND STAINLESS STEEL BOX

BOX TYPE WITH CONCEALED HOSE CONNECTION

FUNCTION: Provides positive non-freeze protection where water is required at the outside of the building and features an integral vacuum breaker. The stainless steel recessed box conceals the nozzle and operating mechanism. The locking cover prevents unauthorized use.

1/4 Turn of the Key Allows Full Flow to Be Obtained

- Continuous Stainless Steel Face Hinge
- Integral Vacuum Breaker Assembly
- Hinged Locking Cover
- 16 Gauge Frame and Cover
- 20 GA. Stainless Steel box

Add 1/4" (6) When Optional Box for Material is Specified

Wall Thickness

2 1/2 (64)
2 5/16 (59)

3/4 (19) Hose Connection

Adjustable Wall Clamp (Specify-WC)

3/4 (19) Male NPT Inlet

Continuous Stainless Steel Face Hinge

50°

NOTES:
1. *Recommended wall opening 6" (150) x 6" (150). Hydrant shall be in the vertical position only, the connection must be on the bottom.
2. When ordering, specify wall thickness in 2" (51) increments as follows: 06(150), 08(205), 10(255), 12(305), 14(355), 16(405), 18(455), 20(510), 22(560) or 24(610). When wall clamp -WC is desired, increase wall thickness dimension by 2" (51).
3. All Jay R. Smith hydrants are manufactured with "NO-LEAD" brazing rings, and USDA approved lubricants.
4. When an Optional Box Face Material is Specified a Concealed Hinge will be Provided, also Add 1/4" (6) to Flange Thickness.
5. The AB1953, California Lead Law, and NSF/ANSI Standard 61-2006 - Drinking Water System Components are not applicable to Jay R. Smith hydrants as they do not convey/dispense water for human consumption through drinking or cooking.
6. Dimensions shown in parentheses are in millimeters.

PATENTED

FIGURE NUMBER
5509QT

WEIGHT
POUNDS
VOLUME
CUBIC FEET
5509QT
HYDRANT PARTS LIST

Vacuum Breaker Assembly

δ These Replacement Parts Available in HPRK-7

* All Parts Accessible from Face of Hydrant by Removing Face Nut.

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<th>NO.</th>
<th>DESCRIPTION</th>
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<td>Face Nut Washer</td>
<td>13b</td>
<td>Valve Body</td>
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<td>VB Piston</td>
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<td>13</td>
<td>Valve Body Assembly</td>
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<td>Box Assembly S.S.</td>
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FIGURE NUMBER
5509QT
The Model 24 and B24 are anti-siphon, vacuum breaker protected wall faucets designed for use in mild climate areas. The Model B24 is enclosed in a flush mounted wall box. Both models are designed to blend with modern architecture for installation on or in homes, service stations, churches, motels, drive-in restaurants, etc. The Model Y24 is designed to be used on a stand pipe in the lawn and garden, etc.

SPECIFICATIONS:

VACUUM BREAKER - ANTI-SIPHON:
- NIDEL® Model 34HF with ¾ inch male hose thread
- ASSE Standard 1011 approved
- IAPMO® listed
- Canadian Standards Association

EPDM PACKING: Prevents leaking.

PACKING NUT: Adjustable brass nut with deep stem guard.

VALVE SEAT: Standard “O” size washer.

HANLES: Furnished with polycarbonate wheel handle and loose tee key.
Optional: Metal wheel handle.

INLETS: Model 24 as shown below,
- Model B24: 24P- ½ or 24P-¾ only
- Model Y24: ¾” FPT.

MAX PRESSURE: 125 p.s.i.

MAX TEMPERATURE: 120° F

SHIPPING WEIGHT:
- MODEL 24 & Y24: 1 lb
- MODEL B24: 13 lbs (brass or chrome box)
  6 lbs (aluminum box)

Inlet Descriptions

MODEL 24/B24
- P-½ Inlet
  ½" FPT
- P-¾ Inlet
  ¾" FPT

MODEL 24 ONLY
- CP Inlet
  COMBINATION
  ½" COPPER TUBE
  ¾" MPT

MODEL 24 ONLY
- C Inlet
  COMBINATION
  ½" COPPER TUBE
  ¾" COPPER TUBE

MODEL 24
Exterior Finish:
Standard - Chrome (CH)
Optional - Rough Brass (BR) or Polished Chrome (PC)
Other Options: Anodized Aluminum Box (AL)

MODEL B24
Exterior Finish:
Standard - Chrome (CH)
Optional - Rough Brass (BR) or Polished Chrome (PC)

MODEL Y24
Exterior Finish:
Standard - Chrome (CH)
Optional - Rough Brass (BR) or Polished Chrome (PC)
The Model 24 and B24 are anti-siphon, vacuum breaker protected wall faucets designed for use in mild climate areas. The Model B24 is enclosed in a flush mounted wall box. Both models are designed to blend with modern architecture for installation on or in homes, service stations, churches, motels, drive-in restaurants, etc. The Model Y24 is designed to be used on a stand pipe in the lawn and garden, etc.

SPECIFICATIONS:

VACUUM BREAKER - ANTI-SIPHON:
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- IAPMO® listed
- Canadian Standards Association

EPDM PACKING: Prevents leaking.

PACKING NUT: Adjustable brass nut with deep stem guard.

VALVE SEAT: Standard "O" size washer.

HANDLES: Furnished with polycarbonate wheel handle and loose tee key.
Optional: Metal wheel handle.

INLETS: Model 24 as shown below.
- Model B24: 24P- ½ or 24P ¾ only.
- Model Y24: ¾" FPT.

MAX PRESSURE: 125 p.s.i.

MAX TEMPERATURE: 120° F

SHIPPING WEIGHT: (per unit)
- MODEL 24 & Y24: 1 lb
- MODEL B24: 13 lbs (brass or chrome box)
  6 lbs (aluminum box)

Inlet Descriptions:
- MODEL 24/B24
  ½" FPT
  ¾" FPT

- MODEL 24 ONLY
  CP Inlet
  Combination
  ¼" Copper Tube
  ½" MPT

- MODEL 24 ONLY
  C Inlet
  Combination
  ¼" Copper Tube
  ¼" Copper Tube

Exterior Finish:
- Standard - Chrome (CH)
- Optional - Rough Brass (BR) or Polished Chrome (PC)
MasterSeries® 850
Double Check Valve Assemblies

Size: 2½" - 10" (65mm - 250mm)

The FEBCO Master Series® 850 Double Check Valve Assemblies are designed for non-health hazard applications.
End Connections – Flanged ANSI B16.1 Class 125

Pressure – Temperature
Max. Working Pressure: 175psi (12.1 bar)
Hydrostatic Test Press: 350psi (24.1 bar)
Temperature Range: 32°F to 140°F (0°C to 60°C)

Materials
Main Valve Body: Ductile iron Grade 65-45-12
Coating: Fusion epoxy coated internal and external AWWA C550-90
Shutoff Valves: NRS resilient wedge gate valves AWWA C509
Trim: Bronze
Elastomer Discs: EPDM
Spring: Stainless steel
Clamp: AWWA C606

Approvals – Standards
- Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California. - 2½" - 8" (65 - 200mm) (Horizontal & Vertical Up)
- ANSI/AWWA (C510) - 2½" - 8" (Horizontal & Vertical Up), 10" (Horizontal)

U/L 1015
2½" - 8" (65 - 200mm)
(Horizontal & Vertical up)
10" (250mm)
(Horizontal)

* Less gates not FM approved. Less gates not UL. Classified unless installed with UL listed gate valves.

Models
- UL/FM OS&Y RW Gate Valves
- Wye-Strainer

Capacity

FEBCO product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact FEBCO. FEBCO reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on FEBCO products previously or subsequently sold.
Model 850 / Materials of Construction

Dimensions and Weights
Size: 2½" - 10" (65 - 250mm)

<table>
<thead>
<tr>
<th>SIZE (IN)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>G</th>
<th>H</th>
<th>NRS</th>
<th>CSAY</th>
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<tr>
<td>in.</td>
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*With NRS Gate Valves
Note: Dimensions shown are nominal. Allowances must be made for normal manufacturing tolerances.
MasterSeries® 850
Double Check Valve Assemblies

Size: 2½" - 10" (65mm - 250mm)

The FEBCO Master Series® 850 Double Check Valve Assemblies are designed for non-health hazard applications. End Connections - Flanged ANSI B16.1, Class 125

Pressure – Temperature
Max. Working Pressure: 175psi (12.1 bar)
Hydrostatic Test Press: 350psi (24.1 bar)
Temperature Range: 32°F to 140°F (0°C to 60°C)

Materials
Main Valve Body: Ductile iron Grade 65-45-12
Coating: Fusion epoxy coated internal and external
Shutoff Valves: NRS resilient wedge gate valves AWWA C509
Trim: Bronze
Elastomer Discs: EPDM
Spring: Stainless steel
Clamp: AWWA C606

Approvals – Standards
• Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California. - 2½" - 8" (65 - 200mm) (Horizontal & Vertical Up)
• ANSI/AWWA (C510) - 2½" - 8" (Horizontal & Vertical Up), 10" (Horizontal)

2½" - 8"
(65 - 200mm)
(Horizontal & Vertical Up)
10" (250mm)
(Horizontal)

Models
• UL/FM CS&Y RW Gate Valves
• Wye-Strainer

Model 850 Double Check Valve Assembly
U.S. Patent No. 4,589,635

Model 850 Vertical Installation
4" min (100mm)
Refer to local codes

6" Min. (150mm)
Refer to local codes

Capacity

FEBCO product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact FEBCO. FEBCO reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on FEBCO products previously or subsequently sold.
Model 850 / Materials of Construction

Top View

Dimensions and Weights

Size: 2½" - 10" (65 - 250mm)

<table>
<thead>
<tr>
<th>SIZE (IN)</th>
<th>A</th>
<th>B</th>
<th>C*</th>
<th>D</th>
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</tbody>
</table>

* With NRS Gate Valves

Note: Dimensions shown are nominal. Allowances must be made for normal manufacturing tolerances.
Series 850
Double Check Valve Assemblies
Size: ½" - 2" (15mm - 50mm)

The FEBCO Series 850 Double Check Valve Assemblies are designed for non-hazard applications. End Connections - NPT ANSI / ASME B1.20.1

Pressure – Temperature
Max Working Pressure: 175psi (12.1 bar)
Hydrostatic Test Pressure: 350psi (24.1 bar)
Temperature Range: 32°F to 140°F (0°C to 60°C)

Materials
Valve Body: Bronze
Elastomers: Silicone
Springs: Stainless Steel

Models
• Wyco Strainer

Approvals – Standards
• ANSI/AMWA Conformance (G310-62)
• Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California.

Capacity

Typical Installation

12" (300mm) Minimum Clearance to Fixed Structure

Flow

Series 850 ½" - 2" (15-50mm) Outdoor Installation

Job Name __________________________  Contractor __________________________
Job Location __________________________ Approval __________________________
Engineer __________________________  Contractor’s PO. No. __________________________
Approval __________________________  Representative __________________________

FEBCO product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact FEBCO. FEBCO reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on FEBCO products previously or subsequently sold.
Dimensions and Weights

Size: 1/2" - 2" (15 - 50mm)

<table>
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<tr>
<th>SIZE (DN)</th>
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<th>C</th>
<th>D</th>
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<td>2 1/8</td>
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</table>

Note: Dimensions are nominal. Allowances must be made for normal manufacturing tolerances.
Air and dirt free system water through a single unit.

The performance and efficiency of a heating or cooling system depend on the purity of the system water. The presence of impurities and entrapped air can cause corrosion, cavitation, and mechanical wear and increase costs of air-saturated dirt. This recurring problem of increased maintenance results in unexpected costs and dissatisfied owners.

There is a solution. A system with Spirovent dirt and air separator is installed. This unique design will remove impurities, entrapped air, and scale. The separator keeps the system clean, reducing maintenance costs and increasing system efficiency. Spirovent dirt is a proven, efficient method of achieving a permanently air- and dirt-free system.

The name:
Spirovent Dirt
The principal difference

SPIROVENT DIRT

The unique construction of this combined unit allows for the removal of both entrained air and dirt particles. The patented Spirovent, the core of the Spirovent Dirt unit, removes entrained air particles of all sizes to the bottom of the unit and collect in the dirt chamber eliminating any blockage problems. The air bubbles rise and collect in the air chamber behind being released via an integral suction tube. The dirt can be flushed through the drain while the system remains fully operational. This large dirt collection chamber ensures effective flushing.
The Spirotube makes the difference

The Spirotube is the core of the Spirovent Dirt unit. The Spirotube creates a low velocity area inside the Spirovent that allows air bubbles to rise and dirt particles to sink. There are no strainers, filters or replacement parts to get clogged. Flow always remains constant; without high pressure drop. The result; increased component life and heat transfer capabilities; decreased oxygen-based corrosion and pump cavitation; and the elimination of annoying gurgling, cascading and other air related noises.

Advantages to the Specifier, Installer and Owner

- No bypass, soating valves or replacement filters to clog and reduce flow
- Dirt can be flushed while the system is in full operation.
- Quiet operation
- Minimum pressure drop; always constant
- Increased component life
- Reduced oxygen-based corrosion and pump cavitation
- Provides optimum heat transfer
- Optional removable head for bundle inspection

Ideal placement of a Spirovent unit is based on microbubble separation and Henry’s Law. Simply put, Henry’s Law states that air is released from water as the temperature increases or the pressure decreases. For this reason, the Spirovent is typically installed in the hottest point in the system, for a heating installation, this is in the supply from the boiler. In a chilled water circuit, the warmest point is usually return to the chiller.

For more detailed technical information, ask about our Spirotube booklets.

Install the Spirovent Dirt for optimum performance

Dirt Separation Efficiency Graph

When the drain valve is opened the system pressure flushes out the collected dirt. This only takes a few seconds.

PERMANENTLY AIR AND DIRT FREE SYSTEM WATER
### Technical Specification

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<th>SENIOR</th>
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<td>VDT300</td>
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<tr>
<td><strong>Weight: Drain</strong></td>
<td>45</td>
<td>70</td>
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Approximately 4 ft./sec. inlet velocity

* SPIROVENT Drain models are available with flanged connection and feature a removable lower head to facilitate cleaning.
* 1" through 3½" Senior models are of fabricated steel construction.
* All SPIROVENTs are designed for a maximum working pressure of 140 psi and temperature of 270°F.
* Consult your local sales office for special construction, rating, and material unit requests.
* Custom dimensions available to space limitation.
Spirotherm is the world leader in hydronic air and dirt elimination technology for heating and cooling systems. Spirovents are also installed in the chemical and process industry, solar energy systems and in district heating and cooling applications.

SPIROVENT

SPIROTERM
A Spiral Enterprises Company

Spirotherm, Inc.
25 N. Brandon Drive
Glenview, Illinois, IL 60031
Tel: 630-307-3667
Fax: 630-307-3773
Website: www.spirotherm.com
E-mail: info@spirotherm.com
Thermal Dispersion Technology:

- Permanently mounted devices use state-of-the-art technology and do not require periodic calibration or maintenance.

- Accurately measure airflow rates between 0 and 5,000 fpm (10,000 fpm with fan inlet sensors).

- Each sensing point is independent and calibrated to NIST traceable airflow and temperature standards.

- A microprocessor-based transmitter is included and provides linear output signals for both airflow and temperature.

- Your best choice for direct outside airflow measurement and building pressure control.

- Can be specified with up to 16 independent airflow and temperature sensing points per duct location.

Our Advantage product line includes a variety of airflow/temperature measuring devices.

EBTRON
Thermal Dispersion Airflow Measurement

1663 Hwy. 701 S., Loris SC 29569 • Toll Free: 800.2EBTRON (232.8766) • Fax: 843.756.1838 • Internet: EBTRON.com
Advanced thermal dispersion technology outperforms the competition.

Controlling airflow rates is essential for the successful operation of today's high performance buildings.

Outside air for the dilution of contaminants requires precise monitoring and control of outside airflow rates into the building.

Proper pressurization is essential to limit moisture development within the building envelope. **EBTRON** has been manufacturing thermal dispersion airflow measurement products since 1984. Our trained application specialists, combined with an extensive local representative network, assure your designs meet the performance requirements demanded for today's 21st Century buildings.

### Signal Comparison

- **EBTRON** (large signal / turn-off air)
- **VORTEX** (low signal / 300 lpm)
- **PTOT** (inlet and outlet flow measurement)

Unsurpassed low flow sensitivity!

Each sensor is calibrated at up to 16 airflow rates. All calibration starts from still air. A large signal change with airflow results in accurate airflow measurements, even at low airflow. A microprocessor-based transmitter reads calibration data stored in a memory chip at the sensor probe cable connector plug and "flashes" it into memory during transmitter power up. This makes all **EBTRON** products "plug and play".

The transmitter essentially reverses the calibration process in the field. Each sensor pair is individually read by the transmitter. The measurements are summed and divided by the number of sensor points. A high speed microprocessor provides virtually instantaneous measurement. As a result, **EBTRON** technology is ideal for the direct measurement of outside airflow rates and balancing applications.

In addition, the transmitter is able to detect errors and ignore sensors if a sensor or cable gets damaged. As a result, your system is always running.

### How OUR Thermal Dispersion Works...

Each measurement point uses 2 stable "bead-in-glass" thermistor probes at each sensing point. One thermistor is "self-heated" above ambient temperature by passing current through it. The voltage across the "self-heated" thermistor is measured and the power dissipated to the air stream is calculated.

A second thermistor measures the ambient air temperature very accurately.

Each sensor pair is individually calibrated at 16 velocity points in one of **EBTRON**'s specially designed wind tunnels.

The airflow rate is determined using an algorithm developed by **EBTRON** relating the power and delta T to the airflow rate.

Unlike pitot tube arrays that average non-linear pressures and vortex shudders that have averaging errors when the airflow rate falls below a minimum velocity, each sensing point is independent and contributes equally to the average output of the transmitter.

<table>
<thead>
<tr>
<th>Model</th>
<th>Max. Sensors</th>
<th>Temperature Output</th>
<th>LCD Display</th>
<th>RS-485</th>
<th>Ethernet</th>
<th>Compound FTP-10</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>GT116-PC</td>
<td>16</td>
<td>°C</td>
<td>°F</td>
<td>°C</td>
<td>°F</td>
<td>Yes</td>
<td>Recommended sensor density for most HVAC duct mounted applications.</td>
</tr>
<tr>
<td>GT116-PA</td>
<td>16</td>
<td>°C</td>
<td>°F</td>
<td>°C</td>
<td>°F</td>
<td>No</td>
<td>Most use for duct mounted pitot tube arrays, highly insensitive repeatable.</td>
</tr>
<tr>
<td>ST104-PA</td>
<td>16</td>
<td>°C</td>
<td>°F</td>
<td>°C</td>
<td>°F</td>
<td>Yes</td>
<td>Same as GT116-P without all of the transmitter features. Valid for duct sensor density.</td>
</tr>
<tr>
<td>ST104-F</td>
<td>16</td>
<td>°C</td>
<td>°F</td>
<td>°C</td>
<td>°F</td>
<td>Yes</td>
<td>Same as GT116-F without all of the transmitter features. Valid for duct sensor density.</td>
</tr>
<tr>
<td>GT118</td>
<td>4</td>
<td>°C</td>
<td>°F</td>
<td>°C</td>
<td>°F</td>
<td>Yes</td>
<td>Same as GT116-F without all of the transmitter features. Valid for duct sensor density.</td>
</tr>
<tr>
<td>ST102-B</td>
<td>2</td>
<td>°C</td>
<td>°F</td>
<td>°C</td>
<td>°F</td>
<td>Yes</td>
<td>Same as ST104-F without all of the transmitter features. Valid for duct sensor density.</td>
</tr>
<tr>
<td>ST102-L</td>
<td>2</td>
<td>°C</td>
<td>°F</td>
<td>°C</td>
<td>°F</td>
<td>Yes</td>
<td>Same as ST104-F without all of the transmitter features. Valid for duct sensor density.</td>
</tr>
<tr>
<td>ST102-T</td>
<td>2</td>
<td>°C</td>
<td>°F</td>
<td>°C</td>
<td>°F</td>
<td>Yes</td>
<td>Same as ST104-F without all of the transmitter features. Valid for duct sensor density.</td>
</tr>
</tbody>
</table>

*16th Edition available in September 2023.*
ABB drives for HVAC applications
ACH550, 1 to 550 Hp

DriveIT Low Voltage AC Drive
Facility Managers Say...

- “As the U.S. HVAC Market Leader and the world’s largest manufacturer of Adjustable Frequency Drives, I know that ABB will be here in 10 years time and beyond. This is the most important guarantee you can give me.”

- “With ABB’s standard built-in hardware like the 5% swinging choke and the EMI / RFI filter, I know that any sensitive equipment in my facility will not be adversely affected by drive operation.”

- “I love the Help button, I call it my panic button – it quite simply is always available to guide me with useful information.”

- “The Maintenance Assistant is another great feature of the ABB Drive. I simply do not need to worry about when it is time to service the equipment. The drive tells me when it is time to send people to perform maintenance.”

Built-in EMI/RFI filters
The ACH Series Drive is designed to meet the EMC product standard EN61800-3 for the 1st Environment. These standard filters eliminate the need for any external filtering hardware.

Built-in timers
External timer circuits are no longer needed. Built-in timers - utilizing the real-time clock - allow starting and stopping the drive or changing the speed according to a set time and date. Relay outputs can be operated by the timers to control any auxiliary equipment on-site.

N2, FLN and Modbus embedded
Commonly used HVAC field-buses are embedded into the memory of the drive, ensuring that they are always there if you need them. ABB has a long history in building automation, with more than 100,000 installed drives utilizing serial communications.

LonWorks and Profibus
LonWorks, Profibus and other plug-in modules fit under the cover of the drive. A single twisted pair avoids great lengths of conventional cabling, reducing cost and increasing system reliability.
Swinging choke - up to 64% less harmonics
ABB’s patented swinging choke means the ACH Series Drive reduces harmonics by up to 64% at partial loads when compared to a PWM AFD with no chokes. There is no need to oversize the supply cables.

Pre-configured HVAC application macros
14 different HVAC application macros are pre-programmed into the HVAC drive. Application macros for supply and return fans, cooling tower fans, booster pumps and condensers are available, just to name a few. The user can create two additional application macros, selectable manually or through a customer contact. To illustrate this, the user can create “summer” and “winter” application macros and select between these according to the time of the year.

The motor can deliver full output at 40 °C - shouldn’t the AFD do the same?
ABB’s HVAC drive is rated for continuous operation to 40 °C with full current, without being compromised by temperature variations within any 24-hour period. Full circulation is available, precisely when needed, usually, when it is hot outside. Similarly, Type 12 units can be operated without the need for derating up to 40 °C. And, at 50 °C, only 10% de-rating is required for both UL Type 1 and UL Type 12.

A Contractor’s Point of View...

- “With the Hand Macro, I can move air to dry out the new construction paint and drywall mud without calling for a certified start-up. There’s no need for multiple trips to my job site by the ABB start-up Engineer to commission the drives, and that saves me money.”

- “UL Type 12 enclosures keep the drive electronics free from drywall dust and debris during the construction process.”

- “ABB ACH Series Drive are UL/cUL and CSA Listed and the enclosures are UL Plenum Rated. I can mount the drive in most locations without worries.”

- “I don’t have to search for external components like timers and PID controllers and then worry about their compatibility. It’s all there, in the drive”
Feedback From Temperature Control Contractors...

- “ABB understands the HVAC Market. I save time and money because I do not need to supply interposing relays and control logic to accomplish ‘real world’ functions such as Fireman’s override and damper end-switch proof. ABB has these and many more features built-in.”

- “Finally, a BTL-listed, BACnet-compatible HVAC drive without the need for expensive and unwieldy third-party gateways.”

- “The ABB ACH Series Drive is actually a drive and unitary controller in one. I have 13 free I/O points with every ABB drive provided!”

- “The second PID loop built into the ABB HVAC Drive allows me to control cooling tower bypass valves or other control valves with no additional hardware or cost.”

- “The ABB HVAC Drive is a temperature controls engineer’s dream... on-board passthrough I/O, a free PID loop controller, and broken belt indication. Damper end-switch and smoke purge controls are built-in at no additional charge!”

Interactive maintenance assistant
Maintenance scheduling no longer requires guesswork. The HVAC drive alerts you when maintenance is required based on your individual requirements.

Fault logger
The fault logger of the HVAC drive is especially useful in tracking down drive trips through its use of the real-time clock. In addition to recording both time and date, the fault logger also takes a snapshot of 7 diagnostic values - like motor speed and output current. You know what happened and when.

Two PID controllers as standard
The HVAC drive has two independent PID controllers built in. As an example; one PID controller works with the AFD to maintain the duct static pressure; simultaneously, the other PID controller can be used to control a separate external device, e.g. a chilled water valve. All of this can, of course, be monitored and controlled through serial communications.
**Built-in!**

Wide power range
Drives are available from 1 to 100 Hp, @ 208/240 V, 1 to 550 Hp @ 360/480 V, and 2 to 150 Hp @ 500/600 V covering the vast majority of HVAC applications.

Interactive diagnostic assistant
Should a fault occur, the diagnostic assistant displays, in plain language, possible causes and potential solutions.

Flux optimization
This standard feature means the drive supplies only the voltage and current necessary to drive the load. This results in reduced energy consumption and much lower motor noise levels. Silent operation mode further reduces motor audible noise for sensitive applications.

Versatile software tools:
DriveWindow, Light 2, further facilitates commissioning and maintenance. Pump & Fan Save helps calculate energy savings and pay-back times. ABB’s Harmonics Calculator allows the engineer to run harmonics contribution estimates.

Specifying Engineers State...

- “The 5% swinging choke means I do not need to oversize my supply transformer and cables to meet the NEC.”

- “Specifying a drive that is designed to meet EMC product standards for the First Environment means I will not have job site EMI / RFI issues or complaints.”

- “A keypad that functions like a cell phone — what could be easier?”

- “The built-in communications suite means I can have intelligent drive applications regardless of which temperature control contactor is successful on the project.”

- “When I call ABB, I know I get the right answer.”

- “ABB supplies submittal packages that provide the detailed information and drawings I need to verify quickly that the ABB drive meets my specification requirements. That information saves me a lot of time.”
1) The BMS commands start/stop; internal/external PID setpoints; command digital (relay) outputs, and analog (4-20mA) outputs and reset faults. The BMS reads drive outputs; controlled variable feedback; Hand/Auto selected indication; kWhrs (R); Operating hrs (R); drive amps (broken belt indication); drive temperature; all warnings, faults, and much more.

2) Receive and monitor hard-wired devices -- firestat/freeze stat safety contacts, smoke purge commands -- over the serial link.

3) Open an isolation damper, override a VAV box or any device that requires a maintained contact closure for control. Receive damper end-switch proof contact.

4) The Keypad Display indicates feedback and setpoint in inches of water column - or programmable units intuitive to the user.

5) BMS commands a drive analog output to control hot water valves or any device requiring a 4-20mA analog input.

6) The drive’s external PID Loop Controller controls a chilled water valve or any device requiring a 0-20mA input. Feedback signal is hard-wired to AFD and setpoint is sent via serial comm's.

7) Use the drive’s process PID Loop Controller to maintain supply fan pressure via adjusting fan speed. Pressure feedback is hard-wired to AFD and setpoint is sent via serial comm's.
Keypad & Firmware Features

The new ABB ACH Series Drive Keypad takes the typical operator interface to a new level.

ABB ACH Series Drive Keypads use full language, no codes. And this keypad emulates the human interface of a cell phone. Using the intuitive interface, you control the panel’s functions in one of 14 selectable languages.

The new ABB ACH Series Drive has pioneered several new-to-the-market features such as Maintenance Assistants, Diagnostic Assistants, Programming Assistants, and Help Screens.

For example, if there’s a trip off line, pressing the Help Key brings the user to the Diagnostic Assistant; it suggests possible causes of the trip and probable corrective actions.

Programming Assistants configure the drive for an application. For example, the PID Assistant prompts the user through a series of 12 questions; and uses the answers to these questions to set 26 parameters inside of the drive’s program. No need to navigate the drive menus.

The Maintenance Assistant alerts users when equipment maintenance is required, based on selected inputs. Utilize the Revolution Counter and Maintenance Assistant to signal personnel when it’s time to replace the pump packing.

The Keypad features two soft keys; their functions change according to the operating state of the panel. Hand-Off-Auto buttons provide local control for local-speed and start/stop control.

The Help Button brings up a description of what the effect of parameter changes would be — in full sentences!

Faults can be time and date stamped via the real-time clock. A fault logger stores status information such as amps, volts and presence of a run command at the time of the fault.

Patented Swinging Choke (Reactor) Reduces Harmonics

ABB ACH Series Drives include a 5% swinging choke. Filter chokes fall into two categories: the Linear Choke and the Swinging Choke. A Linear Choke has an inductance that is relatively constant up to the rated value of current. These chokes are designed so that they will not saturate when carrying all of the load current.

The Swinging Choke is used in applications where the change in inductance is inversely proportional to the change in load current (such as variable torque applications). A well designed swinging choke provides the proper inductance to ensure adequate filtering and the continuous flow of current through the rectifier for all levels of load current.

From the graph (at right), it can be seen that the built-in swinging choke in all ABB HVAC Drives allows the drive to deliver over 25% less harmonics at partial loads than a conventional 3% reactor; more than 60% less harmonics than a drive with no reactor!

The reduced harmonics means the drive input current is the same as the output current. No need to oversized branch circuit wiring to comply with NEC 430-2!

<table>
<thead>
<tr>
<th>Variable Torque Load vs. % Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
</tr>
<tr>
<td>80</td>
</tr>
<tr>
<td>70</td>
</tr>
<tr>
<td>60</td>
</tr>
<tr>
<td>50</td>
</tr>
<tr>
<td>40</td>
</tr>
<tr>
<td>30</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

Typical % Demand Distortion

- PWM Drive w/o Choke
- PWM Drive w/ 3% Choke
- ACH550

55% less harmonics at full load, better than 64% less harmonics at partial loads. (HVAC Drives spend most of their operating hours at partial loads.)
ASME Expansion Tanks
Series “B” Full Acceptance Pre-Charged Bladder Tanks

- Increases System Performance
- Reduces Oxygen Corrosion
- Prevents Waterlogging
- Replaceable Bladder
- Meets ASME Section VIII, Division 1 Standards
- 125 PSI Working Pressure Standard
- High Maximum Operating Temperature 240°F
- Seismic Restraints Available
- “California” Sight Glass Available
- Higher Working Pressure of 175 PSI & 250 PSI Available
Series "B" Full Acceptance Tanks

DESCRIPTION
Series "B" expansion tanks are ASME rated pre-charged bladder-type pressure vessels. The Series "B" tank is designed to absorb the expansion forces of heating/cooling system water while maintaining proper system pressurization under varying operating conditions. The heavy duty bladder contains system water thereby eliminating tank corrosion and waterlogging problems.

OPERATING DATA
Maximum working pressure ............ 125 PSI (862kPa)
Maximum operating temperature ........ 240°F (115°C)

MATERIALS OF CONSTRUCTION
System Connection: Forged Steel
Shell: Carbon Steel
Bladder: Heavy Duty Butyl Rubber
Designed and Constructed per ASME Section VIII, Division 1

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>MODEL NUMBER</th>
<th>TANK VOLUME</th>
<th>ACCEPTANCE VOLUME</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>APPROX. SHPG. WT.</th>
<th>APPROX. WT. 100% FULL*</th>
</tr>
</thead>
<tbody>
<tr>
<td>116550</td>
<td>B-200</td>
<td>53 (200)</td>
<td>53 (200)</td>
<td>24</td>
<td>36% (396)</td>
<td>1/4</td>
<td>19</td>
<td>(483)</td>
<td>192 (87)</td>
<td>629 (285)</td>
<td></td>
</tr>
<tr>
<td>116551</td>
<td>B-300</td>
<td>90 (300)</td>
<td>80 (300)</td>
<td>24</td>
<td>50% (1222)</td>
<td>1/4</td>
<td>30</td>
<td>(483)</td>
<td>268 (122)</td>
<td>926 (421)</td>
<td></td>
</tr>
<tr>
<td>116552</td>
<td>B-400</td>
<td>106 (400)</td>
<td>106 (400)</td>
<td>30</td>
<td>64% (1644)</td>
<td>1/4</td>
<td>30</td>
<td>(483)</td>
<td>309 (140)</td>
<td>1184 (537)</td>
<td></td>
</tr>
<tr>
<td>116553</td>
<td>B-500</td>
<td>132 (500)</td>
<td>120 (500)</td>
<td>36</td>
<td>78% (1981)</td>
<td>1/4</td>
<td>24</td>
<td>(483)</td>
<td>328 (149)</td>
<td>1417 (643)</td>
<td></td>
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<tr>
<td>116554</td>
<td>B-600</td>
<td>158 (600)</td>
<td>158 (600)</td>
<td>36</td>
<td>91% (2076)</td>
<td>1/4</td>
<td>24</td>
<td>(483)</td>
<td>510 (232)</td>
<td>1814 (823)</td>
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<tr>
<td>116555</td>
<td>B-800</td>
<td>211 (800)</td>
<td>211 (800)</td>
<td>36</td>
<td>93% (2076)</td>
<td>1/4</td>
<td>24</td>
<td>(483)</td>
<td>656 (297)</td>
<td>2306 (1046)</td>
<td></td>
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<tr>
<td>116556</td>
<td>B-1000</td>
<td>264 (1000)</td>
<td>264 (1000)</td>
<td>36</td>
<td>93% (2076)</td>
<td>1/4</td>
<td>24</td>
<td>(483)</td>
<td>891 (313)</td>
<td>2869 (1301)</td>
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<tr>
<td>116557</td>
<td>B-1200</td>
<td>317 (1200)</td>
<td>317 (1200)</td>
<td>36</td>
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<td>1/4</td>
<td>24</td>
<td>(483)</td>
<td>775 (353)</td>
<td>3394 (1539)</td>
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<td>370 (1300)</td>
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<td>93% (2076)</td>
<td>1/4</td>
<td>24</td>
<td>(483)</td>
<td>905 (410)</td>
<td>3958 (1795)</td>
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<tr>
<td>116559</td>
<td>B-1400</td>
<td>422 (1400)</td>
<td>422 (1400)</td>
<td>36</td>
<td>93% (2076)</td>
<td>1/4</td>
<td>24</td>
<td>(483)</td>
<td>1183 (537)</td>
<td>4865 (2116)</td>
<td></td>
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<tr>
<td>116793</td>
<td>B-2500</td>
<td>690 (2500)</td>
<td>680 (2500)</td>
<td>36</td>
<td>93% (2076)</td>
<td>1/4</td>
<td>24</td>
<td>(483)</td>
<td>1445 (655)</td>
<td>6950 (3125)</td>
<td></td>
</tr>
<tr>
<td>116794</td>
<td>B-3000</td>
<td>792 (3000)</td>
<td>782 (3000)</td>
<td>36</td>
<td>93% (2076)</td>
<td>1/4</td>
<td>24</td>
<td>(483)</td>
<td>1470 (659)</td>
<td>8164 (3649)</td>
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</tr>
<tr>
<td>116795</td>
<td>B-3500</td>
<td>925 (3500)</td>
<td>925 (3500)</td>
<td>36</td>
<td>93% (2076)</td>
<td>1/4</td>
<td>24</td>
<td>(483)</td>
<td>2110 (957)</td>
<td>9741 (4418)</td>
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<td>116819</td>
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<td>1057 (4000)</td>
<td>1057 (4000)</td>
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<td>93% (2076)</td>
<td>1/4</td>
<td>24</td>
<td>(483)</td>
<td>2230 (1011)</td>
<td>10950 (4967)</td>
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<tr>
<td>116820</td>
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<td>1321 (5000)</td>
<td>1321 (5000)</td>
<td>36</td>
<td>93% (2076)</td>
<td>1/4</td>
<td>24</td>
<td>(483)</td>
<td>2450 (1111)</td>
<td>13403 (6079)</td>
<td></td>
</tr>
</tbody>
</table>

Dimensions: Gallons (Ltrs.), Inches (mm), Weights: LBS. (KG)

Dimensions subject to change. Not to be used for construction purposes. *Approximate weight 100% full occurs if bag tails or air charge is lost. Refer to submittals for optional seismic restraints.

TYPICAL HYDRONIC HEATING/COOLING APPLICATION

NOTE: Tanks are factory pre-charged at 12 PSI (83 kPa).

ITT Industries
Series 80
In-Line Mounted
Centrifugal Pumps

Applications
- Hydronic Heating & Cooling Systems
- Industrial Process
- General Service
- Pressure Boosting

Advantages
- Close Coupled
- Space Saving
- Long Life
- Low Maintenance
- Horizontal or Vertical Installation
- Several Seal Options

Engineered for life
A. STANDARD MECHANICAL SEAL

D. 80-PF STUFFING BOX CONSTRUCTION
(with four rings of packing plus a flush RING)
B&G SERIES 80 – AN EFFICIENT RUGGED CLOSE COUPLED PUMP DESIGNED FOR VERTICAL AND HORIZONTAL IN-LINE MOUNTING.

The Series 80 is an efficient, heavy-duty, close coupled pump designed for horizontal and vertical in-line mounting. Available in sizes 1 1/2" through 8", 1/4 to 50 HP at 1750 RPM and 5 to 60 HP at 3500 RPM. Available in bronze fitted and all cast iron construction. Flows to 2500 GPM, heads to 300 ft. Available in 175#, 250# and 300# working pressure designs.

MOTOR BRACKET
Precisely machined rigid cast iron motor bracket ensures positive concentric alignment between motor and pump components. This helps promote maintenance-free operation and contributes to pump longevity.

VOLUTE
Standard construction is for 175 psi working pressure, with flanges drilled to mate with 125# ANSI companion flanges. 250 psi and 300 psi working pressure with 250# flange drilling is optionally available.*

MOTORS
Standard NEMA JM and JP vertical solid shaft motors in dripproof enclosures are utilized on B&G Series 80 pumps. High efficiency motors, as well as TEFC and explosion proof enclosures are available options. Motor may be rotated on its bracket at 90° intervals to allow convenient positioning of the junction box.

CONSTRUCTION MATERIALS
(For parts in contact with fluid pumped)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>BRONZE FITTED PUMP</th>
<th>ALL IRON PUMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Shaft</td>
<td>Alloy Steel</td>
<td>Alloy Steel</td>
</tr>
<tr>
<td>2. Volute</td>
<td>Cast Iron ASTM A159</td>
<td>Cast Iron ASTM A159</td>
</tr>
<tr>
<td>3. Impeller</td>
<td>Cast Bronze ASTM 48564</td>
<td>Cast Iron ASTM A159</td>
</tr>
<tr>
<td>4. Shaft Glove</td>
<td>Aluminum Bronze</td>
<td>#304 Stainless Steel</td>
</tr>
<tr>
<td>5. Impeller Key</td>
<td>#304 Stainless Steel</td>
<td>#304 Stainless Steel</td>
</tr>
<tr>
<td>6. Impeller Washer</td>
<td>Brass</td>
<td>#304 Stainless Steel</td>
</tr>
<tr>
<td>7. Impeller Lock</td>
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<td>#304 Stainless Steel</td>
</tr>
<tr>
<td>8. Impeller Gypsum</td>
<td>#304 Stainless Steel</td>
<td>#304 Stainless Steel</td>
</tr>
<tr>
<td>9. Volute Guarded</td>
<td>Cellulose Fiber</td>
<td>Cellulose Fiber</td>
</tr>
<tr>
<td>10. Seal Assemblies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Standard Seal</td>
<td>Buna N</td>
<td>Buna N</td>
</tr>
<tr>
<td>Faces</td>
<td>Carbon-Ceramic</td>
<td>Carbon-Ceramic</td>
</tr>
<tr>
<td>Metal Parts</td>
<td>Brass or Stainless Steel</td>
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</tr>
<tr>
<td>Spring</td>
<td>Stainless Steel</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td>B. Flushed Single Seal (Bell)</td>
<td>EPR</td>
<td>EPR</td>
</tr>
<tr>
<td>O-Rings</td>
<td>Carbon-Tungsten Carbide</td>
<td>Carbon-Tungsten Carbide</td>
</tr>
<tr>
<td>Faces</td>
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<td>Stainless Steel</td>
</tr>
<tr>
<td>Metal Parts</td>
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</tr>
<tr>
<td>Spring</td>
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<td>Stainless Steel</td>
</tr>
<tr>
<td>C. Flushed Double Seal (Bell)</td>
<td>EPR</td>
<td>EPR</td>
</tr>
<tr>
<td>O-Rings</td>
<td>Carbon-Ceramic</td>
<td>Carbon-Ceramic</td>
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<tr>
<td>Faces</td>
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<td>Stainless Steel</td>
</tr>
<tr>
<td>Metal Parts</td>
<td>Stainless Steel</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td>D. Packed Type (Bell)</td>
<td>Impregnated</td>
<td>Impregnated</td>
</tr>
<tr>
<td>Packing</td>
<td>Impregnated Brass/Teplon</td>
<td>Brass/Teplon</td>
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<td>Cast Iron</td>
</tr>
<tr>
<td>Lantern Ring</td>
<td>Glass Filled TFE</td>
<td>Glass Filled TFE</td>
</tr>
</tbody>
</table>

SEAL SELECTION GUIDE

A. STANDARD SEALS
Buna-PH Limitations 7-9; Temperature Range -20°F to +225°F
EPR-PH Limitations 7-11; Temperature Range -20 to +250°F
For use on open or closed clear water systems.
Maximum working pressure 175 psi.

B. FLUSHED SINGLE SEALS (Stuffing Box Design)
PH Limitations 7-11; Temperature Range -20 to +300°F
For use on closed or open systems where the temperature or pressure requirements exceed the limitations of the standard seal. Available in 175 psi or 250 psi working pressures.

C. FLUSHED DOUBLE SEALS (Stuffing Box Design)
PH Limitations 7-9; Temperature Range 0 to +250°F
For use on closed or open low pressure systems which may contain a high concentration of abrasives. An external flush is required. Maximum working pressure 175 psi.

D. PACKING (Bell Stuffing Box Design)
PH Limitations 7-9; Temperature Range 0 to +100°F
For use on open or closed systems which require a large amount of make-up water, as well as systems which are subjected to widely varying chemical conditions and solids buildup. Maximum working pressure 175 psi.

*250 psi working pressure requires 80-S construction. 300 psi working pressure requires 80-S construction with silicon carbide seal.

**For operating temperatures above 250°F, a cooled flush is required - and is recommended for temperatures above 225°F for optimum seal life. On closed systems, cooling is accomplished by inserting a small heat exchanger in the flush line to cool the fluid.
Flush-line Filters and Sediment Separators are available on special request.
### Dimensions

Dimensions subject to change without notice. Do not use for construction purposes.

#### Details of Flanges

<table>
<thead>
<tr>
<th>Pump Flanges in mm (inches)</th>
<th>Pipe Size</th>
<th>Outer Diameter</th>
<th>Thickness</th>
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</thead>
<tbody>
<tr>
<td>11/16&quot;</td>
<td>6</td>
<td>15/32&quot;</td>
<td>11/32&quot;</td>
</tr>
<tr>
<td>2</td>
<td>61/32&quot;</td>
<td>15/32&quot;</td>
<td>11/32&quot;</td>
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<tr>
<td>2 1/2</td>
<td>71/32&quot;</td>
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<td>11/32&quot;</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
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</tr>
<tr>
<td>8</td>
<td>141/32&quot;</td>
<td>35/32&quot;</td>
<td>11/32&quot;</td>
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</tbody>
</table>

#### Pump Flanges

| Motor Frame | A | B | C | D | E | F | G | H | I | J | K | L | M | N | P | Q | R | S | T | U |
| 143 | 8 | 18 | 48 | 21 | 61 | 71 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 145 | 8 | 18 | 48 | 21 | 61 | 71 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 148 | 8 | 18 | 48 | 21 | 61 | 71 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 151 | 8 | 18 | 48 | 21 | 61 | 71 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

#### Notes

- For 1 phase motors add 1" maximum to dimensions E & H.
<table>
<thead>
<tr>
<th>MOTOR FRAME</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>MAX. E</th>
<th>ST. SEAL- F</th>
<th>STUFF. BOX F</th>
<th>STD. F</th>
<th>MAX. E</th>
<th>STUFF. BOX F</th>
<th>125 ANSI</th>
<th>250 ANSI</th>
<th>MAX. R</th>
<th>T</th>
<th>MIN. V</th>
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<tr>
<td>192</td>
<td>15% (390)</td>
<td>9/32 (235)</td>
<td>29/64 (49)</td>
<td>32/64 (49)</td>
<td>117/64 (194)</td>
<td>24/64 (38)</td>
<td>8/64 (100)</td>
<td>0/64 (0)</td>
<td>8/32 (25)</td>
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<td>17/32 (27)</td>
<td>15/32 (24)</td>
<td>17/32 (27)</td>
<td>17/32 (27)</td>
<td></td>
</tr>
<tr>
<td>194</td>
<td>14 (350)</td>
<td>28 (350)</td>
<td>6/8 (166)</td>
<td>8/8 (216)</td>
<td>24/64 (38)</td>
<td>9/32 (235)</td>
<td>42/64 (65)</td>
<td>44/64 (65)</td>
<td>11/32 (171)</td>
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<td>10/32 (30)</td>
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</tr>
<tr>
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<td>27/32 (00)</td>
<td>9/16 (239)</td>
<td>15/32 (30)</td>
<td>42/64 (65)</td>
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<td>294</td>
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<td>17/32 (27)</td>
<td>17/32 (27)</td>
<td>17/32 (27)</td>
<td></td>
</tr>
</tbody>
</table>

Dimensions subject to change without notice. Use in applications not covered by the dimensions is at your own risk.
### TYPICAL SPECIFICATIONS FOR BELL & GOSSETT SERIES 80 IN-LINE PUMPS

Furnished and installed with capacities as shown on plans. Pumps shall be in-line type, close-coupled single stage design, for installation in vertical or horizontal position, and capable of being serviced without disturbing piping connections.

Pump casing shall be of Class 30 cast iron. The impeller shall be of cast bronze, closed type, balanced to ANSI/HI Grade G6.3, keyed to the shaft and secured by locking capscrew.

The liquid cavity shall be sealed off at the motor shaft by an internally-flushed mechanical seal with ceramic seal seat and carbon seal ring, suitable for continuous operation at 225°F.

A bronze shaft sleeve shall completely cover the wetted area under the seal.

Pumps shall be rated for minimum of 175 psi working pressure (optional 250 psi and 300 psi working pressure). The pump case shall have gage tappings at the suction and discharge nozzles and will include drain ports.

Motor shall meet NEMA specifications and shall be the size, voltage and enclosure called for on the plans. It shall have heavy-duty, grease lubricated ball bearings, completely adequate for the maximum load for which the pump is designed.

Each pump shall be factory tested per Hydraulic Institute standards. It shall then be thoroughly cleaned and painted with at least one coat of high-grade machinery enamel prior to shipment.

Pumps shall be Series 80 as manufactured by ITT Bell & Gossett or equal.
Series 80-SC
Split-Coupled Vertical In-Line Centrifugal Pump

Bell & Gossett®

ITT Industries
Engineered for life
B&G Series 80-SC Split-Coupled
Vertical In-Line Centrifugal Pump

Applications
- Hydronic Heating and Cooling Systems
- Industrial Process
- General Service
- Pressure Boosting

Advantages
- Low Supply and Return Arrangement
- Space Saving Design
- Easy Mechanical Seal Maintenance
- Support Ring for Easy Installations

Motor
The energy efficient EPACT C-face motor is standard for this pump with an open drip-proof enclosure. This pump will also accept the vertical P-base motor or IEC motors that meet International Standards IEC 6034 as an option.

Mechanical Seal
The seal has a compact Rotating Unlubricated Seal Head design for easier seal replacement. The positive metal-to-metal drive system reduces the torsional stress on the bellows. The bellows are pressure supported without creases or folds, creating lower stress, and resulting in longer seal life.

External Flush
The external flush line has a manual valve to remove air from the seal chamber to ensure cooling liquid at the seal for fast initial start-up.

Motor Bracket
Brackets are designed for a wider access area for easier seal removal. The combination motor bracket/volute coverplate assures positive concentric alignment of the motor to the pump casing. The motor bracket will accept TC, HP, and IEC motors.

Coupler Guard
Conforms to ANSI and OSHA for safe operation.

Ease of Serviceability
The axially-split spacer coupling permits seal maintenance without disturbing the pump or motor. The seal can be removed between the gap in the pump and motor shaft when the coupler is removed.

Impeller
The 80-SC impeller is balanced to ANSI grade 6.3 and provides years of trouble free service.

Pump Shaft
The 416 stainless steel pump shaft provides high levels of corrosion resistance to the pumped fluid.

Volute
An Anti-Swirl vane below the impeller eye keeps NPSHr to a minimum. The 6" and larger pumps include a double volute to minimize radial loads for extended bearing and mechanical seal life. The volute includes a support ring on the bottom of the casing for installations adjacent to the floor.

Throttle Bushing
Antimony-impregnated carbon graphite throttle bushing for longer service life.
# Construction Materials

<table>
<thead>
<tr>
<th>Description</th>
<th>Bronze Fitted Pump</th>
<th>All Iron Pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shaft</td>
<td>4165 Stainless Steel</td>
<td>4165 Stainless Steel</td>
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<tr>
<td>Volute</td>
<td>Cast Iron ASTM #A159</td>
<td>Cast Iron ASTM #A159</td>
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<tr>
<td>Impeller</td>
<td>Cast Bronze ASTM #8584</td>
<td>Cast Iron ASTM #8584</td>
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<td>Stainless Steel</td>
<td>Stainless Steel</td>
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<td>Impeller Lock Washer</td>
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<td>Impeller Capscrew</td>
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<td>Volute Gasket</td>
<td>Cellulose Fiber</td>
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<td>Throttle Bushing</td>
<td>Carbon Graphite</td>
<td>Carbon Graphite</td>
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<tr>
<td>Seal Assemblies</td>
<td></td>
<td></td>
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<tr>
<td>- Standard Seal -</td>
<td>EPR</td>
<td>EPR</td>
</tr>
<tr>
<td>Inside Flushed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bellows</td>
<td>Carbon-Ceramic</td>
<td>Carbon-Ceramic</td>
</tr>
<tr>
<td>Faces</td>
<td>316 Stainless Steel</td>
<td>316 Stainless Steel</td>
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<tr>
<td>- Optional Seal -</td>
<td>EPR</td>
<td>EPR</td>
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<tr>
<td>Inside Flushed</td>
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<tr>
<td>Bellows</td>
<td>Carbon-Tungsten Carbide</td>
<td>Carbon-Tungsten Carbide</td>
</tr>
<tr>
<td>Faces</td>
<td>316 Stainless Steel</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>- Optional Seal -</td>
<td>EPR</td>
<td>EPR</td>
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<tr>
<td>Outside Flushed</td>
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<tr>
<td>O-Rings</td>
<td>Carbon-Ceramic</td>
<td>Carbon-Ceramic</td>
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</tr>
<tr>
<td>Gland Plate</td>
<td>Stainless Steel</td>
<td>Stainless Steel</td>
</tr>
</tbody>
</table>

Standard pump construction is 175 psi working pressure with 125 ANSI flange drilling. Optional 250 psi working pressure with 250 ANSI flange drilling is available.

## Seal Selection Guide

### A. Standard Seal – Inside with flush line.

EPR/Carbon-Ceramic pH limitations 7-9; Temperature Range -20° to +250° F*

Maximum pressure is 175 psi.

### B. Optional Seal – Inside with flush line.

EPR/Carbon-Tungsten Carbide pH limitations 7-11; Temperature Range -20° to +250° F* For use on open or closed clear water systems.

Maximum pressure is 250 psi.

### C. Optional Seal – Outside with flush line.

EPR/Carbon-Ceramic Type “BB2”; pH limitations 7-9; Temperature Range -20° to +250° F* For use on closed or open systems where the pressure requirements exceed the limitations of the standard seal or an alternate seal design is desired. Maximum pressure is 250 psi.

* For operating conditions above 250° F and no greater than 300° F, a cooled flush is required.

On closed systems cooling is accomplished by inserting the optional heat exchange kit in the flush line to cool the seal flushing fluid.

Flush line filters and sediment separators are available on request.
Engineering Specifications

Furnish and install pumps with capacities as shown on plans. Pumps shall be split-coupled in-line, single-stage design, for installation in a vertical position motor up, capable of being serviced without disturbing piping connections.

Pump volute shall be of Class 30 cast iron. It shall be designed with a base ring matching an ANSI 125# flange for pump support. The impeller shall be of cast bronze, enclosed type, balanced to Hydraulic Institute Standards (ANSI/HI 9.6.4-2000, figure 9.6.4.15B). The allowable residual imbalance conforms to ANSI grade 6.3, keyed to the stainless steel shaft and secured by a locking capscrew. The pump shaft shall be guided by a carbon graphite lower throttle bushing.

The combination motor bracket and volute coverplate shall be a one-piece unit to ensure concentric alignment of the motor to the pump casing.

The liquid cavity shall have a tapped flush line with manual valve to remove air from the seal chamber for fast initial start-up. The mechanical seal shall have a compact Rotating Unified Seal Head design with EPR elastomer bellows and a positive metal-to-metal drive system to reduce the torsional stress on the bellows. The bellows will be pressure supported without creases or folds for long life.

The spacer coupling shall be of high tensile aluminum, split to allow the servicing of the seal without disturbing the pump or motor. The motor bracket shall contain a carbon steel coupler guard conforming to both ANSI B15.1-2000 and OSHA 1910.219 standards for safety.

(Optional) The seal flush line shall be fitted with a factory installed 50 micron cartridge filter (cyclone separator when pump differential pressure exceeds 30 psig).

Pumps shall be rated for continuous operation at a minimum of 175 psi working pressure (optional 250 psi) and 250°F. The volute shall have gauge tappings at the suction, and discharge nozzles and vent and drain tappings at the top and bottom.

Motor shall be energy efficient EPACT complying to NEMA or IEC specifications and shall be the size, voltage and enclosure called for on the plans. It shall have heavy-duty grease-lubricated ball bearings, completely adequate for the maximum load for which the pump is designed.

Each pump shall be factory tested per Hydraulic Institute standards. It shall then be thoroughly cleaned and painted with at least one coat of high-grade machinery enamel prior to shipment.

Pumps shall be Series 80-SC as manufactured by Bell & Gossett.
Type "SU" Heat Exchangers

Heating liquids with steam "U" tube design
GENERAL INFORMATION

The "SU" Heat Exchangers is an instantaneous type, designed to heat liquids with steam. Although the "SU" is used for heating many kinds of liquids, its widest application is for heating water. This catalog lists ratings for most commonly required temperature rises through a wide range of steam pressures. The ratings are based on steam in the shell and the liquid to be heated flowing through the tubes.

These units can be connected to any steam boiler or system. The capacity of the boiler should be checked to be sure that it is sufficient to handle the load imposed by the "SU". Some method of controlling steam flow to the exchanger should be provided and installed according to manufacturers directions.

"SU" Heat Exchangers are available in 2, 4 or 6 pass construction and are cataloged for lengths up to 10 feet and shell diameters through 30 inches. They may be obtained, on special order, in lengths greater than 10 feet. They can also be manufactured of materials other than those listed.

SELECTION PROCEDURE

For heating water with steam, the following conditions must be known.

a. Water flow in tubes, G.P.M. - (Gals. per minute).
   b. Water temperature in and out, °F.
   c. Steam at the unit, P.S.I.

Step #1 - From Table A, determine the clean tube TEMPERATURE FACTOR using water temperature in, out and steam pressure. Interpolate between columns when necessary.

Step #2 - Add appropriate fouling allowance to clean tube TEMPERATURE FACTOR from Chart 2 on page 7, recommended fouling allowances are shown. Chart 2 shows the percentage increase that is equivalent to each fouling factor. Note that the percent of fouling allowance is also determined by the tube velocity. Selection tables show water velocity for the various flow rates.

Step #3 - In the "SU" Capacity Tables, move down the required G.P.M. column and select the unit having a TEMPERATURE FACTOR equal to or greater than the required value from Step #2 above.

Example:
Select an Instantaneous Heater
Rqd. - 25 G.P.M.
Water Temp. in - 40°F.
Water Temp. out - 140°F.
Steam Pressure - 20 P.S.I.G.
Fouling - .0005
Temperature factor from table A, page 4, is 27.5. From 25 gpm, column in a 6" diameter four pass unit, tentatively select a SU63-4. Since the tube velocity is 3.7 fps, and the required fouling is .0005, turn to Chart 2, page 7 and add 25% i.e., multiply 27.5 x 1.25 = 34.2 which is the final temperature factor. Now choose a SU64-4. Pressure drop is 2.9 ft.

An SU64-6 or an SU47-2 could also have been selected, with their respective pressure drops.

**CONSTRUCTION FEATURES AND MATERIALS**

<table>
<thead>
<tr>
<th>SHELL DIAMETER</th>
<th>TUBESIDE</th>
<th>MATERIAL SPECIFICATIONS – Cast Iron and Brass Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 PASS</td>
<td>4 PASS</td>
</tr>
<tr>
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<td>150</td>
</tr>
<tr>
<td>30&quot;</td>
<td>150</td>
<td>150</td>
</tr>
</tbody>
</table>

**Notes:**
- *50 ft. cast iron heads available on special order.
- *6-pass heads are fabricated steel, 14" through 20".
- **Temperature rating limited to 300°F. If higher rating required consult factory.
Cemline Flash Tanks

Cemline Flash Tanks are used to flash steam from high temperature condensate prior to introducing into low-pressure lines and to flash condensate prior to returning to the boiler of the condensate tank.

Horizontal Flash Tanks:
Cemline flash tanks are ASME code constructed and stamped for 150 PSI working pressure of carbon steel and have a prime painted exterior. Vessels are registered with the national board and will meet state codes.

Options
1. Sparge tubes are sometimes furnished but not necessary. Sparge tubes diffuse condensate entering the flash tank. Sparge tubes have 1/4" holes at 0-90-180, and 270 degrees, equal in total cross sectional area to the cross sectional area of the pipe. Sparge tubes are either 1 1/2" or 2" IPS. Larger sparge tubes are available.
2. Internal drop leg outlet. Internal drop leg will allow condensate to drain from the bottom and coolest part of the vessel.
3. 4" x 6" Handhole. Handhole allows for internal inspection and cleaning.

### Horizontal Specification
Flash tank shall be manufactured by Cemline Corporation and shall be
model_._ Flash tank shall be ASME Code constructed and stamped for 150# working pressure. Flash tank shall be registered with the National Board of Boiler and Pressure Vessel Inspectors. Interior of flash tank shall be blacksteel. Exterior shall be coated with one coat shop primer. Flash tank shall be piped as shown on drawing.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Capacity (Gallons)</th>
<th>D Diameter</th>
<th>L Length</th>
<th>I Inlet</th>
<th>V Vent</th>
<th>A Drain</th>
<th>O Outlet</th>
</tr>
</thead>
<tbody>
<tr>
<td>H13FST</td>
<td>13</td>
<td>10.75&quot;</td>
<td>39&quot;</td>
<td>1.5&quot;</td>
<td>2&quot;</td>
<td>1&quot;</td>
<td>1.5&quot;</td>
</tr>
<tr>
<td>H18FST</td>
<td>18</td>
<td>12&quot;</td>
<td>39&quot;</td>
<td>1.5&quot;</td>
<td>2&quot;</td>
<td>1&quot;</td>
<td>1.6&quot;</td>
</tr>
<tr>
<td>H24FST</td>
<td>24</td>
<td>14&quot;</td>
<td>39&quot;</td>
<td>1.5&quot;</td>
<td>2&quot;</td>
<td>1&quot;</td>
<td>1.6&quot;</td>
</tr>
<tr>
<td>H30FST</td>
<td>30</td>
<td>16&quot;</td>
<td>38&quot;</td>
<td>1.5&quot;</td>
<td>2.5&quot;</td>
<td>1.5&quot;</td>
<td>1.5&quot;</td>
</tr>
<tr>
<td>H48FST</td>
<td>48</td>
<td>18&quot;</td>
<td>48&quot;</td>
<td>2&quot;</td>
<td>2.5&quot;</td>
<td>1.5&quot;</td>
<td>1.5&quot;</td>
</tr>
<tr>
<td>H60FST</td>
<td>60</td>
<td>24&quot;</td>
<td>49&quot;</td>
<td>2&quot;</td>
<td>3&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
</tr>
<tr>
<td>H125FST</td>
<td>125</td>
<td>30&quot;</td>
<td>48&quot;</td>
<td>2&quot;</td>
<td>3&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
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<tr>
<td>H180FST</td>
<td>180</td>
<td>36&quot;</td>
<td>48&quot;</td>
<td>2&quot;</td>
<td>3&quot;</td>
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<tr>
<td>H240FST</td>
<td>240</td>
<td>42&quot;</td>
<td>48&quot;</td>
<td>2&quot;</td>
<td>3&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
</tr>
</tbody>
</table>

Sizing Available on CD-ROM

Hand Hole (Optional)

Internal Sparging Pipe (Optional)

Condensate Inlet

Drain and Outlet

Options
- Flash tank shall be furnished with internal spray pipe with 1/4" holes drilled at 0-90-180, and 270 degrees. Total cross section area of holes shall be equal to or greater than cross section of condensation pipe.
- Tank shall have 4" x 6" handhole.
- Tank shall have internal elbow and down pipe.
Cemline Flash Tanks

Cemline flash tanks are used to flash steam from high temperature condensate prior to introducing into low-pressure lines and to flash condensate prior to returning to the boiler of the condensate tank.

Vertical Flash Tanks

Vertical flash tanks use a cyclone effect to separate the flash from the condensate. These flash tanks require a smaller tank.

Cemline offers flash tanks in both horizontal and vertical configuration. Horizontal flash tanks are based on flashing from the surface of a pool of water. The surface flashing requires a larger tank. Vertical flash tanks use a cyclone effect to separate the flash from the condensate. These flash tanks require a smaller tank.

Cemline flash tanks are ASME code constructed and stamped for 150 PSI working pressure of carbon steel and have a prime painted exterior. Vessels are registered with the national board and will meet state codes.

Vertical Specification

Flash tank shall be manufactured by Cemline Corporation and shall be model VST. Flash tank shall be ASME Code constructed and stamped for 150# working pressure. Flash tank shall have 150# RF flanges. Flash tank shall be registered with the National Board of Boiler and Pressure Vessel Inspectors. Interior of flash tank shall be black steel. Exterior shall be coated with one coat shop primer. Flash tank shall be piped as shown on drawing.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>D Diameter</th>
<th>L Length</th>
<th>I Inlet (FLG)</th>
<th>V Vent (FLG)</th>
<th>O Outlet (NPT)</th>
<th>H Height</th>
<th>B Distance to Inlet</th>
<th>E Opening (NPT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>V4FST</td>
<td>6 5/8&quot;</td>
<td>36&quot;</td>
<td>2&quot;</td>
<td>2.5&quot;</td>
<td>1.5&quot;</td>
<td>50&quot;</td>
<td>26&quot;</td>
<td>1.5&quot;</td>
</tr>
<tr>
<td>V8FST</td>
<td>8 5/8&quot;</td>
<td>36&quot;</td>
<td>3&quot;</td>
<td>4&quot;</td>
<td>1.5&quot;</td>
<td>50&quot;</td>
<td>26&quot;</td>
<td>1.5&quot;</td>
</tr>
<tr>
<td>V20FST</td>
<td>12 3/4&quot;</td>
<td>42&quot;</td>
<td>4&quot;</td>
<td>6&quot;</td>
<td>2&quot;</td>
<td>56&quot;</td>
<td>32&quot;</td>
<td>2&quot;</td>
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<tr>
<td>V40FST</td>
<td>16&quot;</td>
<td>48&quot;</td>
<td>5&quot;</td>
<td>6&quot;</td>
<td>2&quot;</td>
<td>62&quot;</td>
<td>38&quot;</td>
<td>2&quot;</td>
</tr>
<tr>
<td>V62FST</td>
<td>20&quot;</td>
<td>48&quot;</td>
<td>8&quot;</td>
<td>8&quot;</td>
<td>2&quot;</td>
<td>62&quot;</td>
<td>38&quot;</td>
<td>2.5&quot;</td>
</tr>
</tbody>
</table>
**Series CC™ Condensate Units**

Simplex or Duplex 1,000 thru 15,000 sq. ft. EDR
250 thru 37,500 lb./hr.

**Cast Iron Receivers**: for years of dependable service; warranted for 20 years from date of shipment against failure due to corrosion.

**Centrifugal Pumps**: provide generous running clearances. Standard 3500 RPM for best hydraulic efficiencies, optional 1750.

**Float Switches**: Double pole heavy duty, externally adjustable.

**Maximum Condensate Temperature**: 200°F (93°C)

209°F (98°C) available at certain points

**OPTIONAL EQUIPMENT INCLUDES**:
- Factory Mounted Control Panels
- Water Level Gauge
- Dial Thermometer
- Inlet Basket Strainers
- Suction Butterfly Valves (Available on pump with capacities to 115gpm [435l/min])
- 3 Types of Alternation
- Discharge Pressure Gauges
- High Level Alarm
<table>
<thead>
<tr>
<th>SYSTEM CAPACITY</th>
<th>PUMP CAPACITY GPM (l/s)</th>
<th>DISCHARGE PRESSURE PSIG (kPa)</th>
<th>MOTOR HORSEPOWER 3500 RPM</th>
<th>1750 RPM</th>
<th>DISCHARGE SIZE IN. (mm)</th>
<th>SERIES CC™ CONDENSATE UNITS</th>
<th>RECEIVER CAPACITY GAL. (L)</th>
<th>INLET SIZE IN. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000 thru 6,000 Sq. Ft. EdR</td>
<td>6 (23)</td>
<td>15&quot; (103)</td>
<td>1/2</td>
<td>1/2</td>
<td>**</td>
<td>**</td>
<td>3/4 (19)</td>
<td>61.5CC</td>
</tr>
<tr>
<td>250 thru 1,500 lb./hr. (113-680 kg/hr)</td>
<td>9 (34)</td>
<td>15&quot; (103)</td>
<td>1/2</td>
<td>1/2</td>
<td>**</td>
<td>**</td>
<td>3/4 (19)</td>
<td>62.5CC</td>
</tr>
<tr>
<td>1,000 thru 9,000 Sq. Ft. EdR</td>
<td>12 (45)</td>
<td>15&quot; (103)</td>
<td>1/2</td>
<td>1/2</td>
<td>**</td>
<td>**</td>
<td>3/4 (19)</td>
<td>64CC</td>
</tr>
<tr>
<td>250 thru 2,250 lb./hr. (113-1,021 kg/hr)</td>
<td>15 (57)</td>
<td>15&quot; (103)</td>
<td>1/2</td>
<td>1/2</td>
<td>**</td>
<td>**</td>
<td>3/4 (19)</td>
<td>65CC</td>
</tr>
<tr>
<td>12,000 Sq. Ft. EdR</td>
<td>22 (83)</td>
<td>15&quot; (103)</td>
<td>1/2</td>
<td>1/2</td>
<td>**</td>
<td>**</td>
<td>3/4 (19)</td>
<td>66CC</td>
</tr>
<tr>
<td>3,750 lb./hr. (1,701 kg/hr)</td>
<td>30 (114)</td>
<td>15&quot; (103)</td>
<td>1/2</td>
<td>1/2</td>
<td>**</td>
<td>**</td>
<td>3/4 (19)</td>
<td>67CC</td>
</tr>
<tr>
<td>22,000 Sq. Ft. EdR</td>
<td>37 (140)</td>
<td>15&quot; (103)</td>
<td>1/2</td>
<td>1/2</td>
<td>**</td>
<td>**</td>
<td>3/4 (19)</td>
<td>68CC</td>
</tr>
<tr>
<td>5,000 lb./hr. (2,495 kg/hr)</td>
<td>45 (170)</td>
<td>15&quot; (103)</td>
<td>1/2</td>
<td>1/2</td>
<td>**</td>
<td>**</td>
<td>3/4 (19)</td>
<td>69CC</td>
</tr>
<tr>
<td>30,000 Sq. Ft. EdR</td>
<td>45 (170)</td>
<td>15&quot; (103)</td>
<td>1/2</td>
<td>1/2</td>
<td>**</td>
<td>**</td>
<td>3/4 (19)</td>
<td>70CC</td>
</tr>
<tr>
<td>7,500 lb./hr. (3,402 kg/hr)</td>
<td>60 (211)</td>
<td>15&quot; (103)</td>
<td>1/2</td>
<td>1/2</td>
<td>**</td>
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<td>3/4 (19)</td>
<td>71CC</td>
</tr>
<tr>
<td>37,000 Sq. Ft. EdR</td>
<td>75 (262)</td>
<td>15&quot; (103)</td>
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<td>1/2</td>
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<td>**</td>
<td>3/4 (19)</td>
<td>72CC</td>
</tr>
<tr>
<td>9,250 lb./hr. (4,196 kg/hr)</td>
<td>90 (321)</td>
<td>15&quot; (103)</td>
<td>1/2</td>
<td>1/2</td>
<td>**</td>
<td>**</td>
<td>3/4 (19)</td>
<td>73CC</td>
</tr>
<tr>
<td>45,000 Sq. Ft. EdR</td>
<td>105 (370)</td>
<td>15&quot; (103)</td>
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<td>1/2</td>
<td>**</td>
<td>**</td>
<td>3/4 (19)</td>
<td>74CC</td>
</tr>
</tbody>
</table>

1 Sq. Ft. EdR = lb./hr. Condensate

* Maximum Condensate Temperature: 200°F (93°C) 3500 RPM ONLY.
** 3500 RPM is standard. 1750 RPM is not available.
11300 RPM units to 50 psig discharge pressure use “B” design receiver as standard.
3300 RPM units 60 gal or more use “A” design receiver. 1750 RPM units use “A” design receiver.
<table>
<thead>
<tr>
<th>SYSTEM CAPACITYSY</th>
<th>PUMP CAPACITY GPM (l/min)</th>
<th>DISCHARGE PRESSURE PSIG (kPa)</th>
<th>MOTOR HORSEPOWER 3500 RPM</th>
<th>1750 RPM</th>
<th>DISCHARGE SIZE IN. (mm)</th>
<th>SERIES CC™ CONDENSATE UNITS</th>
<th>MODEL NUMBER</th>
<th>RECEIVER CAPACITY GAL. (L)</th>
<th>INLET SIZE IN. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60,000 Sq. Ft. EDR</td>
<td>60 (227)</td>
<td>15 (103)</td>
<td>15 (103)</td>
<td>1 1/2</td>
<td>1 1/2</td>
<td>2 (61)</td>
<td>601.SCC</td>
<td>52 (197)</td>
<td>3 (76)</td>
</tr>
<tr>
<td>15,000 lb./hr. (6,804 kg/hr)</td>
<td>40 (276)</td>
<td>20 (130)</td>
<td>25 (172)</td>
<td>2 2</td>
<td>2 2</td>
<td>602.SCC</td>
<td>602.SCC</td>
<td>602.SCC</td>
<td>602.SCC</td>
</tr>
<tr>
<td>75,000 Sq. Ft. EDR</td>
<td>75 (318)</td>
<td>30 (207)</td>
<td>35 (235)</td>
<td>3 3</td>
<td>3 3</td>
<td>603.SCC</td>
<td>603.SCC</td>
<td>603.SCC</td>
<td>603.SCC</td>
</tr>
<tr>
<td>19,750 lb./hr. (8,955 kg/hr)</td>
<td>40 (276)</td>
<td>20 (130)</td>
<td>25 (172)</td>
<td>2 2</td>
<td>2 2</td>
<td>604.SCC</td>
<td>604.SCC</td>
<td>604.SCC</td>
<td>604.SCC</td>
</tr>
<tr>
<td>90,000 Sq. Ft. EDR</td>
<td>90 (341)</td>
<td>30 (207)</td>
<td>35 (235)</td>
<td>4 4</td>
<td>4 4</td>
<td>605.SCC</td>
<td>605.SCC</td>
<td>605.SCC</td>
<td>605.SCC</td>
</tr>
<tr>
<td>24,250 lb./hr. (11,000 kg/hr)</td>
<td>60 (414)</td>
<td>50 (354)</td>
<td>55 (395)</td>
<td>4 5</td>
<td>4 5</td>
<td>606.SCC</td>
<td>606.SCC</td>
<td>606.SCC</td>
<td>606.SCC</td>
</tr>
<tr>
<td>112,000 Sq. Ft. EDR</td>
<td>112 (424)</td>
<td>40 (276)</td>
<td>45 (325)</td>
<td>4 5</td>
<td>4 5</td>
<td>607.SCC</td>
<td>607.SCC</td>
<td>607.SCC</td>
<td>607.SCC</td>
</tr>
<tr>
<td>28,000 lb./hr. (12,701 kg/hr)</td>
<td>60 (414)</td>
<td>50 (354)</td>
<td>55 (395)</td>
<td>5 5</td>
<td>5 5</td>
<td>608.SCC</td>
<td>608.SCC</td>
<td>608.SCC</td>
<td>608.SCC</td>
</tr>
<tr>
<td>150,000 Sq. Ft. EDR</td>
<td>150 (568)</td>
<td>60 (414)</td>
<td>70 (495)</td>
<td>6 6</td>
<td>6 6</td>
<td>609.SCC</td>
<td>609.SCC</td>
<td>609.SCC</td>
<td>609.SCC</td>
</tr>
<tr>
<td>37,500 lb./hr. (17,010 kg/hr)</td>
<td>60 (414)</td>
<td>70 (495)</td>
<td>80 (605)</td>
<td>7 7</td>
<td>7 7</td>
<td>610.SCC</td>
<td>610.SCC</td>
<td>610.SCC</td>
<td>610.SCC</td>
</tr>
</tbody>
</table>

† Sq. Ft. EDR = Lb./hr. Condensate **3500 RPM is standard; 1750 RPM is not available.

STANDARD UNIT FEATURES:
- Cast Iron Receiver, sizes 14 gallon (53L) and larger have provision for second pump. Receiver sized for 1 minute net storage.
- Cast Iron Receivers are warranted for 20 years from date of shipment against failure due to corrosion.
- Centrifugal Pump(s) with drip-proof motors. Pump capacity sized 2 times system return rate.
- Float switch(es).

ORDERING INSTRUCTIONS:
Specify basic Model No., RPM, single or duplex, phase, operating voltage, special features. Note: TEFC and explosion proof motors available. The motor horsepower requirement is often greater using explosion proof as they have unity service factor. A horsepower increase is not necessary using TEFC motors.

OPTIONAL FEATURES AVAILABLE AS SPECIFIED:
- Water level gauge w/shut-off valve*
- Dial Thermometer*
- Inlet Basket Strainer
- Discharge Pressure Gauges
- NEMA 4 or NEMA 7 Float Switches
- Mechanical Alternator provides sequencing of duplex pumps and standby of second pump on high level. (NEMA 4 or 7 mechanical alternators available on receiver sizes 36 gallons [136L] and larger)
- Control Panels, see page 4. (Control Panels cannot be mounted on 6 & 9 gallon [23 & 34L] receivers, use 14 gallon [53L] minimum)
- Suction Butterfly Valve
  3" (76mm) (Available for pump capacities to 75 gpm [284/µl])
- Suction Butterfly Valve
  3 1/2" (89mm) (Available for pump capacities to 76 to 115 gpm [288 to 435/µl])
- TEFC or Explosion Proof Motors
- High Level Float Switch/Standy Float Switch (Consult factory for arrangement)
- Lifting Eyes (Available on Receiver sizes 23 gallon [87L] and larger)
- Tapping/openings not drilled on 9 or 14 gallon (34 or 53L) unless option is specified.
*Not available on 6 gallon (23L) receivers.
6 & 9 GALLON RECEIVER WITH 609PF PUMP
2DCC25

**DIAL THERMOMETER**
(Optional, 9 [34]
GAL ONLY)

**GAUGE GLASS**
(Optional, 9 [34]
GAL ONLY)

**FLOAT SWITCH**
FOR PUMP CONTROL

**1½ (32) NPT DISCHARGE**

**1½ (32) NPT DRAIN**

**1½ (32) NPT INLET**

**1½ (32) NPT VENT**

**1½ (32) NPT OVERFLOW**

**BUTTERFLY SUCTION VALVE**
(Optional not shown, see Note #1)

<table>
<thead>
<tr>
<th>GAL (L)</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>9/16 (23)</td>
<td>7/16 (19)</td>
<td>9/16 (19)</td>
</tr>
<tr>
<td>9</td>
<td>9/16 (23)</td>
<td>9/16 (19)</td>
<td>9/16 (19)</td>
</tr>
</tbody>
</table>

**Note:**
1. For optional Butterfly Suction Valve, add 2" (50mm) to 22½" (570mm) dimension.
2. Optional Discharge Pressure Gauges (not shown) shipped loose.

---

6 & 9 GALLON RECEIVER WITH ALL OTHER PF PUMPS (EXCEPT 609PF)
2DCC26

**DIAL THERMOMETER**
(Optional, 9 [34]
GAL ONLY)

**GAUGE GLASS**
(Optional, 9 [34]
GAL ONLY)

**1½ (32) NPT DISCHARGE WITH ORIFICE**

**23½ (600)**

**23 (580) MAX.**

**1½ (32) NPT DRAIN**

**1½ (32) NPT INLET**

**1½ (32) NPT VENT**

**1½ (32) NPT OVERFLOW**

**BUTTERFLY SUCTION VALVE**
(Optional not shown, see Note #1)

<table>
<thead>
<tr>
<th>GAL (L)</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>9/16 (23)</td>
<td>7/16 (19)</td>
<td>9/16 (19)</td>
</tr>
<tr>
<td>9</td>
<td>9/16 (23)</td>
<td>9/16 (19)</td>
<td>9/16 (19)</td>
</tr>
</tbody>
</table>

**Note:**
1. For optional Butterfly Suction Valve, add 2" (50mm) to 22½" (570mm) dimension.
2. Optional Discharge Pressure Gauges (not shown) shipped loose.
14 GALLON "A" DESIGN RECEIVER (PUMPS ON DIFFERENT SIDES) WITH 609PF PUMP
2DCC11

Note:
1. Optional equipment furnished at extra cost when ordered.
2. Optional Discharge Pressure Gauge ASM and inlet Basket Strainer shipped loose.
3. Optional Butterfly Valve requires the addition of 2" (51mm) to 6 (152mm) and 34 dimensions.
4. Pump discharge varies with pump specification.

14 GALLON "A" DESIGN RECEIVER (PUMPS ON DIFFERENT SIDES)
WITH ALL OTHER PF PUMPS (EXCEPT 609PF). STANDARD FOR ALL 1750 RPM.
STANDARD FOR 3500 RPM UNITS 60PSI OR HIGHER DISCHARGE PRESSURE
2DCC12

Note:
1. Optional equipment furnished at extra cost when ordered.
2. Optional inlet Basket Strainer shipped loose.
3. Optional Butterfly Valve requires the addition of 2" (51mm) to 6 (152mm) and 34 dimensions.
4. Pump discharge varies with pump specification.
14 GALLON "B" DESIGN RECEIVER (PUMPS ON SAME SIDE) WITH 609PF PUMP
2DCC27

ALL DIMENSIONS IN INCHES (mm)

Note:
1. For optional Butterfly Suction Valve, add 2" (51mm) to 27¾" (703mm) dimension.
2. Optional Discharge Pressure Gages (not shown) shipped loose.

14 GALLON "B" DESIGN RECEIVER (PUMPS ON SAME SIDE) WITH ALL OTHER
PF PUMPS (EXCEPT 609PF). STANDARD FOR 3500 RPM UP TO 50 PSI DISCHARGE PRESSURE
2DCC28

ALL DIMENSIONS IN INCHES (mm)

Note:
1. For optional Butterfly Suction Valve, add 2" (51mm) to 24½" (622mm) dimension.
2. Optional Discharge Pressure Gages (not shown) shipped loose.
250 GALLON
2DCC15

ALL DIMENSIONS IN INCHES (mm)

Note:
1. Optional Basket Strainer supplied loose.
2. Optional Butterfly Valve(s) requires addition to the overall dimension as follows:
   2" for 6.75 GPM (61mm for 6.28 H2O)
   3" for 16.115 GPM (127mm for 260-429 H2O)

OPTIONAL ELECTRIC CONTROLS

Description of Optional Panel Components

- Magnetic Starters must be used on all 3 phase motors and single phase motors over 2 HP.
- Disconnect Switches and Circuit Breakers. Either fuses or a circuit breaker is required ahead of the starters to protect against short circuits. A disconnect switch or circuit breaker also provides a means of shutting off power for service.
- Control Power Switching Relay - should be supplied in Duplex or Triplex units when individual pump disconnect switches are specified. This relay is recommended in order to maintain control power to the water makeup system in the event pump #1 disconnect switch is turned off or pump #1 fails. In this event the control power will be automatically supplied by pump #2.
- Selector Switches - "Auto-Off-Hand" selector switches provide a means of shutting off pumps and a means of testing in the "Hands" position. "Off-Hand-Lead-Lag" selector switches may be furnished on duplex units with 2 float switches to provide manual alteration.
- Electric Alternator may be furnished on duplex units to provide automatic sequencing of lead pump. Use only when magnetic starters are provided and only with 2 float switches.
- Transformer is required by the National Electrical Code to reduce control voltage when power supply exceeds 250 volts. A transformer is recommended when voltage exceeds 130 volts. Refer to local codes for requirements.
- Pilot Lights - Pump running pilot lights are available to indicate pump operation.
- Audible Alarm - An alarm to indicate low or high water level may be furnished. A separate tank mounted level switch should be provided with an alarm.

Specified Panel Components to be furnished with unit at extra cost.

Standard panels are supplied with NEMA 2 enclosures and are U.L. listed unless otherwise specified.

ITT Industries

Domestic Pump
8200 N. Austin Avenue
Morton Grove, IL 60053
Phone: (847) 986-3700
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http://fns.ittind.com

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ISO 9001
Certified
Type 92B Pressure Reducing Valve

- Extended Diaphragm Service Life
- Two-Path Control
- Elevated Actuator
- Resilient Seats
- Bellows Stem Guide
- Double Post Stem Guide

Figure 1. Type 92B Pressure Reducing Valve
Bulletin 71.2:92B

Introduction

The Type 92B Pressure Reducing Valve is the standard steam valve for industry. The Type 92B is designed to provide decades of continuous service. It can withstand dirty operating environments while providing accurate and stable pressure control. The Type 92B is applied as a main Pressure Reducing Valve in industrial process heating applications such as heat exchangers, evaporators, digesters, and reactors. Commercial applications include Pressure Reducing Valves for meter runs found in district energy systems, hot water heat exchangers, absorption chillers, and boiler deaerator tanks.

The Type 92B is rated for inlet pressure up to 300 psig (20.7 bar) and inlet temperatures to 600°F (316°C). Maximum controlled outlet pressure is 250 psig (17.2 bar). A large actuator and heavy main spring ensures high accuracy and stability over its entire steam flow range.

A safety override pilot is available for the Type 92B pressure reducing valve. The Type 92B pilot is used in a series installation with the Type 6492HM safety override pilot installed on the upstream valve. The Type 6492HM safety override pilot senses pressure downstream of the second valve, and prevents pressure from rising above safe operating pressure in the event the downstream valve fails. This system is approved by ASME B31.1-1988, 122.14.2.A, and can replace an ASME safety valve when vent piping is not practical and upstream steam pressure does not exceed 400 psig (27.6 bar). Local codes and standards may require approval by an appropriate authority prior to installation.

Features

- **Extended Diaphragm Service Life**—Two-ply construction and dual flex points increases cycle life compared to conventional designs. Stainless steel material ensures satisfactory operation at high steam temperatures.

- **Resilient Seats**—Valve seats are individually lapped for tight shutoff. Beveled seats ensure easy in-line lapping. Plug and valve seats are constructed of hardened stainless steel which reduces wire drawing in wet steam applications.

- **Standard ANSI Face-to-Face**—NPT, CL125 FF, CL150 RF, CL250 RF, and CL300 RF end connections are ANSI standard face-to-face dimensions. The Type 92B main valve is also available with PN 16/25/40 RF end connections.

- **Bellows Stem Guide**—Pilot bellows reduces sticking from scale build-up due to boiler carryover.

- **Elevated Actuator**—Plugging from scale and rust is reduced as condensate will not pool in critical areas.

- **Two-Path Control**—Downstream pressure registers under main valve and pilot diaphragms improving response time.

- **Double Post Stem Guide**—Top and bottom seat guides with Inconel® bushings eliminate lateral plug instability and premature stem wear.

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Figure 2. Typical Type 92B Construction
Specifications

Available Configurations
Pilot-operated globe-style pressure reducing valve with post guiding and flow-to-close valve plug action

Body Sizes and End Connection Styles
See Table 1

Body Ratings and Maximum Inlet Pressures
See Table 3

Minimum Differential Pressures Required for Full Stroke
20 psig (1.4 bar) with Stainless steel spring; 10 psig (0.69 bar) with Inconel® spring

Maximum Outlet (Casing) Pressure
Cast Iron: 150 psig (10.3 bar) or body rating limits, whichever is lower
Steel/Stainless steel: 300 psig (20.7 bar) or body rating limits, whichever is lower

Outlet Pressure Ranges
See Table 2

Flow Coefficients
See Table 5

Flow Capacities
See Table 6

Pressure Registration
External

Maximum Temperature Capabilities
See Table 3

Downstream Control Line Connections
NPS 1 and 1-1/2 (DN 25 and 40): 1/4 NPT
NPS 2 (DN 50): 3/8 NPT
NPS 3 and 4 (DN 80 and 100): 1/2 NPT

Construction Materials

Main Valve
Body, Bottom Flange, Diaphragm Case, and Diaphragm Plate: Cast iron, WCC Steel, or CF8M Stainless steel
Bottom Flange Gasket: Cast iron: Composition; Steel/Stainless steel: Graphite
Diaphragms: Stainless steel
Valve Plug: 410 or 416 Stainless steel
Seat Ring: 416 Stainless steel (standard), 316 Stainless steel (seal weld option)
Valve Plug Guide Bushing: 17-4PH Stainless steel
Spring: 17-4PH Stainless steel or Inconel®
Bleed Orifice Fitting: 416 Stainless steel
Pipe Fittings: Steel or Stainless steel

Type 92B Pilot Mounting Parts
Cast iron: Copper tubing and brass fittings
Steel Body: Stainless steel tubing and corrosion resistant steel fittings
Stainless steel Body: Stainless steel tubing and fittings

Type 92B Pilot
Body and Spring Case: Cast iron, WCC steel, CF8M Stainless steel
Diaphragm Plate Assembly: Aluminum, Steel, and Stainless steel
Diaphragm Gasket: Cast iron: Composition; Steel/Stainless steel: Graphite
Diaphragm, Valve Guide, and Valve Spring: Stainless steel
Valve Stem and Orifice: 416 Stainless steel
Bellows and Bellows Retainer: Bronze (standard) or 321 Stainless steel (high temperature/Stainless steel pilot construction)
Spring: Steel for standard spring and Stainless steel for high temperature spring
Upper Spring Seat: Plated steel for standard construction and Stainless steel for high temperature spring
Lower Spring Seat: Aluminum or Carbon steel
Screen: 304 Stainless steel
Check Valve Assembly: Stainless steel internal with copper housing or all Stainless steel

1. The pressure/temperature limits in this Bulletin or any applicable standard limitation should not be exceeded.

Inconel® is a mark owned by Special Metals Corporation.
### Table 1. Body Sizes and End Connection Styles

<table>
<thead>
<tr>
<th>BODY SIZES, NPS (DN)</th>
<th>CAST IRON BODY</th>
<th>STEEL AND STAINLESS STEEL BODY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (25)</td>
<td>NPT</td>
<td>NPT, SWEP3, CL150 RF, CL300 RF, and PN 16/25/40 RF</td>
</tr>
<tr>
<td>1-1/2 (40) and 2 (50)</td>
<td>NPT, CL125 FF, and CL250 RF</td>
<td>CL125 FF and CL250 RF</td>
</tr>
<tr>
<td>3 (80) and 4 (100)</td>
<td>CL125 FF and CL250 RF</td>
<td>CL150 RF, CL300 RF, PN 16 RF, and PN 25/40 RF</td>
</tr>
</tbody>
</table>

1. Available in steel bodies only.

### Table 2. Outlet Pressure Ranges

<table>
<thead>
<tr>
<th>PILOT TYPE</th>
<th>OUTLET PRESSURE, PSIG (BAR)</th>
<th>SPRING WIRE DIAMETER, INCH (MM)</th>
<th>SPRING FREE LENGTH, INCH (MM)</th>
<th>PART NUMBER</th>
<th>COLOR CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-Pressure</td>
<td>2 to 6 (0.14 to 0.41)</td>
<td>0.207 (5.28)</td>
<td>2.50 (63.5)</td>
<td>1E3936271022</td>
<td>Yellow</td>
</tr>
<tr>
<td></td>
<td>5 to 15 (0.34 to 1.0)</td>
<td>0.234 (5.94)</td>
<td>2.62 (66.5)</td>
<td>1D745ST0012</td>
<td>Green</td>
</tr>
<tr>
<td></td>
<td>13 to 25 (0.50 to 1.7)</td>
<td>0.283 (7.19)</td>
<td>2.44 (62.0)</td>
<td>1E395727102</td>
<td>Black</td>
</tr>
</tbody>
</table>

| High-Pressure | 15 to 50 (1.0 to 2.1) | 0.207 (5.28) | 2.50 (63.5) | 1E3956271022 | Yellow |
|               | 25 to 75 (1.7 to 5.2) | 0.234 (5.94) | 2.62 (66.5) | 1D745ST0012  | Green |
|               | 70 to 150 (4.8 to 10.5) | 0.283 (7.19) | 2.44 (62.0) | 1E395727102   | Black |

| High Temperature | 15 to 100 (1.0 to 6.0) | 0.262 (6.66) | 2.50 (63.5) | 1B924805012  | Unpainted |
|                 | 80 to 200 (5.5 to 17.2) | 0.375 (9.53) | 2.50 (63.5) | 1B924805012  | Unpainted |

### Table 3. Maximum Inlet Pressures and Temperatures

<table>
<thead>
<tr>
<th>BODY MATERIAL</th>
<th>END CONNECTION</th>
<th>MAXIMUM INLET PRESSURE</th>
<th>MAXIMUM TEMPERATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cast Iron</td>
<td>NPT</td>
<td>250 psig (17.2 bar)</td>
<td>400°F (205°C)</td>
</tr>
<tr>
<td></td>
<td>CL125 FF</td>
<td>125 psig (8.6 bar)</td>
<td>355°F (179°C)</td>
</tr>
<tr>
<td></td>
<td>CL250 RF</td>
<td>250 psig (17.2 bar)</td>
<td>400°F (205°C)</td>
</tr>
<tr>
<td>Steel</td>
<td>NPT</td>
<td>300 psig (20.7 bar)</td>
<td>450°F (232°C)</td>
</tr>
<tr>
<td></td>
<td>SWEP</td>
<td>300 psig (20.7 bar)</td>
<td>450°F (232°C)</td>
</tr>
<tr>
<td></td>
<td>CL150 RF</td>
<td>165 psig (11.6 bar)</td>
<td>450°F (232°C)</td>
</tr>
<tr>
<td></td>
<td>CL300 RF</td>
<td>300 psig (20.7 bar)</td>
<td>600°F (315°C)²</td>
</tr>
<tr>
<td></td>
<td>PN 16/25/40 RF (NPS 1, 1-1/2, 2, and 3 (DN 25, 40, 50, and 80))</td>
<td>300 psig (20.7 bar)</td>
<td>600°F (315°C)³</td>
</tr>
<tr>
<td></td>
<td>PN 16 RF (NPS 4 (DN 100))</td>
<td>165 psig (11.6 bar)</td>
<td>450°F (232°C)</td>
</tr>
<tr>
<td></td>
<td>PN 25/40 RF (NPS 4 (DN 100))</td>
<td>300 psig (20.7 bar)</td>
<td>600°F (315°C)³</td>
</tr>
<tr>
<td>Stainless Steel</td>
<td>NPT</td>
<td>300 psig (20.7 bar)</td>
<td>450°F (232°C)</td>
</tr>
<tr>
<td></td>
<td>CL150 RF</td>
<td>175 psig (12.1 bar)</td>
<td>450°F (232°C)</td>
</tr>
<tr>
<td></td>
<td>CL300 RF</td>
<td>300 psig (20.7 bar)</td>
<td>600°F (315°C)²</td>
</tr>
<tr>
<td></td>
<td>PN 16/25/40 RF (NPS 1, 1-1/2, 2, and 3 (DN 25, 40, 50, and 80))</td>
<td>300 psig (20.7 bar)</td>
<td>600°F (315°C)³</td>
</tr>
<tr>
<td></td>
<td>PN 16 RF (NPS 4 (DN 100))</td>
<td>175 psig (12.1 bar)</td>
<td>450°F (232°C)</td>
</tr>
<tr>
<td></td>
<td>PN 25/40 RF (NPS 4 (DN 100))</td>
<td>300 psig (20.7 bar)</td>
<td>600°F (315°C)³</td>
</tr>
</tbody>
</table>

1. 450°F (232°C) with standard seal ring, 600°F (315°C) with seal weld option.

### Table 4. Minimum Differential Pressures for Safety Override System

<table>
<thead>
<tr>
<th>TYPE NUMBER</th>
<th>SPRING RANGE, PSIG (BAR)</th>
<th>SPRING COLOR</th>
<th>MINIMUM PRESSURE AT WHICH MONITORING PILOT CAN BE SET, PSIG (BAR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6452HM</td>
<td>10 to 30 (0.69 to 2.1)</td>
<td>Yellow</td>
<td>10 (0.69) over normal downstream pressure</td>
</tr>
<tr>
<td></td>
<td>25 to 75 (1.7 to 5.2)</td>
<td>Green</td>
<td>10 (0.69) over normal downstream pressure</td>
</tr>
<tr>
<td></td>
<td>70 to 150 (4.8 to 10.3)</td>
<td>Black</td>
<td>15 (1.0) over normal downstream pressure</td>
</tr>
<tr>
<td>6452HTM</td>
<td>15 to 100 (1.0 to 6.9)</td>
<td>Unpainted</td>
<td>10 (0.69) over normal downstream pressure</td>
</tr>
<tr>
<td></td>
<td>60 to 250 (5.5 to 17.2)</td>
<td>Unpainted</td>
<td>25 (1.7) over normal downstream pressure</td>
</tr>
</tbody>
</table>
**Figure 3. Type 92B Operational Schematic**

**Principle of Operation**

(Figure 3)

Compression of the pilot spring pushes diaphragm down and holds pilot valve plug open. Outlet pressure is changed by varying the amount of pilot spring compression.

When steam enters the inlet of the valve, it also enters the pilot supply line and flows through the open pilot valve to the top of the main diaphragm. The force created by this steam pressure on the diaphragm overcomes the force of the main valve spring opening the valve plug and allowing steam to flow downstream. Downstream pressure registers under the main diaphragm through the control line and tends to balance the diaphragm. Steam from the downstream system also registers under the pilot diaphragm through line. Pressure forces the diaphragm upward, permitting the pilot valve plug to move toward the closed position. Flow of steam to the top of the main diaphragm is thereby reduced and the pressure on main diaphragm drops due to the bleed through the orifice. The main valve moves toward the closed position, allowing only enough steam flow to satisfy downstream requirements.

When steam demand increases, the downstream pressure decreases below the setting of the pilot spring. The pilot opens to increase the pressure on the main diaphragm. The main valve opens to increase the flow downstream. Conversely, if the steam demand decreases, the downstream pressure increases and the pilot reacts to decrease the pressure on top of the main diaphragm. The main valve throttles toward the closed position and the steam flow decreases. Thus, through the combination of pilot and main valve operation, control of the downstream steam pressure is maintained.
Safety Override System
(Figure 4)

Once placed in operation, the upstream Type 92B pilot (B) senses the Intermediate pressure between both valves, and the Type 6492HM (A) pilot senses pressure downstream of the second valve. As demand for flow increases, intermediate pressure will fall causing the Type 92B pilot to open. As the Type 92B pilot opens, loading pressure to the main valve increases, opening the main valve.

The Type 6492HM (A) safety override pilot remains open because its setpoint is above the setpoint of the downstream valve. In the unlikely event that the downstream valve falls open, downstream pressure will rise above the downstream valve’s setpoint. This pressure is sensed by the Type 6492HM (A) safety override pilot. As downstream pressure increases the Type 6492HM (A) safety override pilot closes, reducing loading pressure to the upstream main valve, which positions the main valve to maintain desired downstream override pressure.

An internal check valve is included in all Type 92B pilots to limit differential pressure on the main valve diaphragm. In the event of a large decrease in downstream pressure, the check valve opens to relieve diaphragm loading pressure to the downstream system. The check valve cartridge assembly has a factory setting to limit differential pressure across the diaphragm to approximately 40 psid (2.8 bar d). If diaphragm differential pressure reaches approximately 40 psid (2.8 bar d), the check valve opens to relieve diaphragm loading pressure into the downstream system, thereby preventing a high differential across the diaphragm which might otherwise cause diaphragm damage. The check valve closes and normal operation resumes when the differential pressure across the diaphragm is reduced to the proper level.
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In the event that the upstream valve fails, the downstream valve will prevent downstream pressure from rising above safe operating levels. It is recommended to install some type of warning system, such as a sentinel relief valve, to warn the operator that a valve has failed in the system. This will prevent prolonged operation with one valve, which could cause valve trim wear and noise associated with operation at high differential pressures.

Installation

Installation of the Type 92B is dependent on the application. As a minimum, a typical steam pressure reducing station must include a 3-valve bypass, inlet drip leg, inlet strainer (and steam separator if required) and relief valve per ASME Section VIII code. A safety override pressure reducing station can be installed in the event a relief valve is not practical as per ASME B16.122.14 standards, subject to local codes and regulations.

Positioning and Mounting

The Type 92B regulators are intended to be installed with their diaphragm case above the pipeline so that condensate will not collect in the cases. In order to obtain the performance given in this bulletin, connect the downstream end of the control line into a straight run of pipe. The connection should be located at least 6 pipe diameters from the valve body outlet in an unswaged pipeline, or 10 pipe diameters from the swage in a swaged pipeline.

The Type 92B pilot should also be installed with the adjusting screw pointing up and the control line should be sloped with a downward pitch to ensure drainage of condensate. The body should be installed so the flow is in the same direction as the arrow on the body.

Note that the Type 92B pilot may be installed on either side of the body.

Overpressure Protection and Relief Valve Sizing

Overpressure protection is required when piping and components downstream of a steam regulating valve have a maximum allowable working pressure (MAWP) that is lower than the upstream supply pressure to the regulating valve. In some cases, the regulating valve itself may have a lower outlet pressure rating than its inlet pressure rating, which will require overpressure protection.

Governing codes and standards define the type and design of overpressure protection. When full flow relief valves are specified, they must relieve a maximum specified flow at a pressure not to exceed that specified by applicable codes. In North America, the governing code for most steam regulating valve installations is ASME Boiler Code, Section VIII, which may be amended by local codes or variances.

The issue in sizing stream relief valves is quantifying its maximum flow rate. Maximum flow conditions may occur under many conditions, so the entire steam system must be analyzed to make sure the maximum relief valve flow is accurate. Failure to do so may cause overpressure.

In applications where it is determined that the steam regulating valve creates maximum flow to the relief valve, several issues must be resolved prior to quantifying the flow to the relief valve.

1. There must be general agreement on the failure mode of the regulating valve. The Emerson Process Management Regulator Technologies, Inc. (Regulator Technologies) provides wide-open regulating coefficients to assist with sizing steam relief valves. The coefficients assume that the valve plug is at maximum travel and still in its normal orientation. Contact your local Sales Office prior to relief valve sizing in the event that there is disagreement with the mode of failure.

2. Maximum steam flow must be calculated at the pressure obtained at the relief valve's full-open condition. This pressure is typically larger than a relief valve's set pressure. This pressure must be used as the outlet pressure of the steam regulating valve when calculating the maximum flow through the regulating valve.

3. Maximum steam flow should be calculated from the manufacturer's recommended procedure. The Regulator Technologies recommends using either the Fisher® steam sizing equation or IEC sizing procedure.
Figure 5. Type 92B Typical Installations
Figure 6. Safety Override System Installation

Example:

RELIEF VALVE SET: 5 PSIG (1.9 bar)
FULL OPEN: 25 PSIG (1.7 bar)
150 PSIG / 330°F (10.6 MPa / 170°C)
NPS 2 (DN 50) TYPE 92B

Determine the maximum valve flow capacity at wide-open failure.

\[
Q_{\text{max(lbf/hr)}} = \left[ \frac{C_3 P_1}{1 + 0.00065 T_{\text{in}}} \right] \sin \left[ \frac{3417}{C_1} \sqrt{\frac{\Delta P}{P_1}} \right] \text{ DEG}
\]

where:

\( Q \) = Steam flow rate, lbf/hr
\( P_1 \) = Absolute inlet pressure, psia (P1 gauge + 14.7)
\( C_3 \) = Wide-open gas sizing coefficient, see Table 5
\( C_1 \) = Flow coefficient, see Table 5
\( T_{\text{in}} \) = Degrees of steam superheat at inlet, °F
\( \Delta P \) = Pressure drop across regulator, psia

Example Calculation:

\[
Q_{\text{max(lbf/hr)}} = \left[ \frac{74 \times 114.7}{1 + 0.00065 \times 0} \right] \sin \left[ \frac{3417}{35} \sqrt{\frac{75}{114.7}} \right] \text{ DEG}
\]

\( Q_{\text{max}} = 8,330 \text{ lb/hr (3776 kg/hr)} \)

where:

\( C_3 = 74 \)
\( C_1 = 35 \)
\( P_1 = 114.7 \text{ psia (7.9 bar)} \)
\( T_{\text{in}} = 0 \text{ °F (-18 °C)} \)
\( \Delta P = 75 \text{ psia (5.2 bar)} \)
### Table 6. Main Valve Coefficients

<table>
<thead>
<tr>
<th>BODY SIZE, NPS (IN)</th>
<th>FLOW COEFFICIENTS</th>
<th>REGULATING COEFFICIENTS</th>
<th>WIDE-OPEN COEFFICIENTS</th>
<th>REG SIZING COEFFICIENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C₂</td>
<td>C₁</td>
<td>C₀</td>
<td>C₃</td>
</tr>
<tr>
<td>1 (25)</td>
<td>35</td>
<td>16.5</td>
<td>5.4</td>
<td>480</td>
</tr>
<tr>
<td>1 1/2 (40)</td>
<td>35</td>
<td>26</td>
<td>16</td>
<td>921</td>
</tr>
<tr>
<td>2 (50)</td>
<td>59</td>
<td>48</td>
<td>27.4</td>
<td>1461</td>
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<tr>
<td>3 (60)</td>
<td>2000</td>
<td>100</td>
<td>57.1</td>
<td>5042</td>
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<td>4 (100)</td>
<td>2700</td>
<td>135</td>
<td>77.1</td>
<td>4515</td>
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</table>

### Table 6. Capacities

<table>
<thead>
<tr>
<th>INLET PRESSURE, PSIG (bar)</th>
<th>OUTLET PRESSURE, PSIG (bar)</th>
<th>CAPACITIES IN GALLONS PER HOUR (kg/h) OF SATURATED STEAM (BASED ON 10 PERCENT DROP)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NPS 1 (DN 25) Body Size</td>
<td>NPS 1-1/2 (DN 40) Body Size</td>
</tr>
<tr>
<td></td>
<td>Body Size</td>
<td>Body Size</td>
</tr>
<tr>
<td></td>
<td>NPS 2 (DN 60) Body Size</td>
<td>NPS 3 (DN 80) Body Size</td>
</tr>
<tr>
<td></td>
<td>Body Size</td>
<td>Body Size</td>
</tr>
<tr>
<td></td>
<td>NPS 4 (DN 100) Body Size</td>
<td>Body Size</td>
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<tr>
<td></td>
<td>Body Size</td>
<td>Body Size</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 (1.7)</td>
<td>5 (0.34)</td>
<td>660 (239)</td>
</tr>
<tr>
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<td>10 (0.60)</td>
<td>660 (272)</td>
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<td>15 (1.0)</td>
<td>560 (238)</td>
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<tr>
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<td>20 (1.4)</td>
<td>560 (190)</td>
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<td>25 (2.1)</td>
<td>560 (168)</td>
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<td>30 (2.8)</td>
<td>560 (147)</td>
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<td>35 (3.4)</td>
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<td>40 (4.1)</td>
<td>560 (111)</td>
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<td>5 (0.34)</td>
<td>1500 (600)</td>
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<td>1500 (600)</td>
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<td>1500 (600)</td>
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<td>1500 (600)</td>
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<td>90 (8.9)</td>
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<td>100 (10.0)</td>
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<td>75 (5.2)</td>
<td>125 (6.9)</td>
<td>5 (0.34)</td>
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<td>10 (0.60)</td>
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<td>100 (6.9)</td>
<td>125 (6.9)</td>
<td>5 (0.34)</td>
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<td>55 (12.5)</td>
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<td>95 (32.5)</td>
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1. Pined capacities are for the Type 50 valve with electromechanical loading system.
## Bulletin 71.2:92B

### Table 6. Capacities<sup>9</sup> (continued)

<table>
<thead>
<tr>
<th>INLET PRESSURE, PSIG (bar)</th>
<th>OUTLET PRESSURE, PSIG (bar)</th>
<th>CAPACITIES IN POUNDS PER HOUR (kg/hr) OF SATURATED STEAM (BASED ON 10 PERCENT DROP)</th>
<th>NPS 1 (ON 25) Body Size</th>
<th>NPS 1-1/2 (ON 40) Body Size</th>
<th>NPS 2 (ON 60) Body Size</th>
<th>NPS 3 (ON 80) Body Size</th>
<th>NPS 4 (ON 100) Body Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 (17.2)</td>
<td>20 (1.4)</td>
<td>4460 (2023)</td>
<td>7650 (3501)</td>
<td>13,000 (5907)</td>
<td>27,200 (12,358)</td>
<td>37,300 (16,919)</td>
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<tr>
<td></td>
<td>40 (2.8)</td>
<td>4460 (2023)</td>
<td>7500 (3592)</td>
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<td>27,500 (12,383)</td>
<td>37,600 (17,146)</td>
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<td>60 (4.1)</td>
<td>4460 (2023)</td>
<td>7500 (3592)</td>
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<td>80 (5.5)</td>
<td>4460 (2023)</td>
<td>8150 (3688)</td>
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<td>27,600 (12,429)</td>
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<td>100 (6.9)</td>
<td>4450 (2023)</td>
<td>8150 (3679)</td>
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<td>4150 (1867)</td>
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<td>160 (10.3)</td>
<td>4050 (1807)</td>
<td>7650 (3535)</td>
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<tr>
<td>300 (21.0)</td>
<td>20 (1.4)</td>
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<td>5190 (2354)</td>
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<td>175 (12.1)</td>
<td>4780 (2160)</td>
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<td>13,700 (6214)</td>
<td>28,600 (12,975)</td>
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<td>3590 (1757)</td>
<td>7650 (3453)</td>
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<td>23,200 (10,534)</td>
<td>31,400 (14,243)</td>
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1. Printed capacities are for the Type 92B with electrопneumatic loading systems.

### Table 7. Approximate Weights

<table>
<thead>
<tr>
<th>BODY MATERIAL</th>
<th>END CONNECTION STYLES</th>
<th>BODY SIZE, NPS (ON)</th>
<th>APPROXIMATE WEIGHTS, POUNDS (kg) WITH HIGH-PRESSURE PILOT&lt;sup&gt;10&lt;/sup&gt;</th>
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<tbody>
<tr>
<td>Cast Iron</td>
<td>NPT</td>
<td>1 (25)</td>
<td>55 (25)</td>
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<tr>
<td></td>
<td></td>
<td>1-1/2 (40)</td>
<td>73 (33)</td>
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<td>2 (50)</td>
<td>103 (40)</td>
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<td>CL125 FF</td>
<td>1-1/2 (40)</td>
<td>77 (35)</td>
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<td>2 (50)</td>
<td>110 (45)</td>
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<td>3 (60)</td>
<td>175 (75)</td>
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<td>4 (100)</td>
<td>243 (110)</td>
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<td></td>
<td>CL250 RF</td>
<td>1-1/2 (40)</td>
<td>63 (35)</td>
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<td>2 (50)</td>
<td>116 (52)</td>
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<td>3 (60)</td>
<td>190 (65)</td>
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<td>4 (100)</td>
<td>263 (113)</td>
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<td>NPT</td>
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<td>65 (25)</td>
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<td></td>
<td>1-1/2 (40)</td>
<td>89 (40)</td>
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<td>2 (50)</td>
<td>122 (55)</td>
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<td>Steel or Stainless Steel</td>
<td>CL150 RF, PN 16 RF</td>
<td>1-1/2 (40)</td>
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<td></td>
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<td>2 (50)</td>
<td>95 (45)</td>
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<td>3 (60)</td>
<td>132 (55)</td>
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<td>4 (100)</td>
<td>220 (105)</td>
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<td>CL310 RF, PN 16/25/40 RF; PN 25/90 RF</td>
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<td></td>
<td>4 (100)</td>
<td>225 (102)</td>
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1. Add 5 pounds (2 kg) for low-pressure pilot.
## Figure 7. Dimensions

<table>
<thead>
<tr>
<th>BODY SIZE, NPS (DN)</th>
<th>A (DIMENSIONS, INCHES (mm))</th>
<th>Low-Pressure Pilot</th>
<th>High-Pressure/High Temp Pilot</th>
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<tbody>
<tr>
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<td>CL425 RF and CL500 RF</td>
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</tr>
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<td>1 (25)</td>
<td>6.50 (165)</td>
<td>7.25 (184)</td>
<td>7.75 (197)</td>
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<tr>
<td>1-1/2 (40)</td>
<td>8.00 (203)</td>
<td>9.25 (235)</td>
<td>9.95 (253)</td>
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<tr>
<td>2 (50)</td>
<td>9.25 (235)</td>
<td>10.00 (254)</td>
<td>10.50 (267)</td>
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<tr>
<td>3 (60)</td>
<td>11.75 (298)</td>
<td>12.75 (324)</td>
<td>13.88 (352)</td>
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<tr>
<td>4 (100)</td>
<td>13.88 (353)</td>
<td>14.50 (368)</td>
<td>15.00 (381)</td>
</tr>
</tbody>
</table>

1. Cast iron flanges are not available for the NPS 1 (DN 25) body.
2. 3.44-inches (87 mm) NPT bodies.
### Bulletin 71.2:92B

**Ordering Guide**

**Inlet Steam Conditions (Select One)**
- □ ≤ 125 psig (8.6 bar)/353°F (178°C)
- □ ≤ 175 psig (12.1 bar)/450°F (232°C)
- □ ≤ 185 psig (12.8 bar)/450°F (232°C)
- □ ≤ 250 psig (17.2 bar)/406°F (208°C)
- □ ≤ 300 psig (20.7 bar)/450°F (232°C)
- □ ≤ 300 psig (20.7 bar)/600°F (315°C)

**Main Valve Body Size and Material (Select One)**

**Cast Iron**
- □ NPS 1 (DN 25)
- □ NPS 1-1/2 (DN 40)
- □ NPS 2 (DN 50)
- □ NPS 3 (DN 80)
- □ NPS 4 (DN 100)

**Steel**
- □ NPS 1 (DN 25)
- □ NPS 1-1/2 (DN 40)
- □ NPS 2 (DN 50)
- □ NPS 3 (DN 80)
- □ NPS 4 (DN 100)

**Stainless Steel**
- □ NPS 1 (DN 25)
- □ NPS 1-1/2 (DN 40)
- □ NPS 2 (DN 50)
- □ NPS 3 (DN 80)
- □ NPS 4 (DN 100)

**End Connection Style (Select One)**

**Cast Iron**
- □ NPT (NPS 1, 1-1/2, and 2)
- □ CL125 FF Flanged (NPS 1-1/2, 2, 3, and 4 (DN 40, 50, 80, and 100))
- □ CL250 RF Flanged (NPS 1-1/2, 2, 3, and 4 (DN 40, 50, 80, and 100))

**Steel**
- □ NPT (NPS 1, 1-1/2, and 2)
- □ CL150 RF Flanged
- □ CL300 RF Flanged
- □ PN 16/25/40 RF (NPS 1, 1-1/2, 2, and 3 (DN 25, 40, 50, and 80))
- □ PN 16 RF (NPS 4 (DN 100))
- □ PN 25/40 RF (NPS 4 (DN 100))

**Stainless Steel**
- □ NPT Screwed (NPS 1, 1-1/2, and 2)
- □ CL150 RF Flanged
- □ CL300 RF Flanged
- □ PN 16/25/40 RF (NPS 1, 1-1/2, 2, and 3 (DN 25, 40, 50, and 80))
- □ PN 16 RF (NPS 4 (DN 100))
- □ PN 25/40 RF (NPS 4 (DN 100))

**Main Valve Spring (Select One)**
- □ 17-4 Stainless steel (standard)**
- □ Inconel® (optional)**

**Pilot Material (Select One)**
- □ Cast Iron
- □ Steel
- □ Stainless steel

**Pilot Type and Spring Range (Select One)**

**High-Pressure**
- □ 15 to 30 psig (1,0 to 2,1 bar), Yellow
- □ 25 to 75 psig (1,7 to 5,2 bar), Green
- □ 70 to 150 psig (4,8 to 10,3 bar), Black

**Low-Pressure**
- □ 2 to 6 psig (0,14 to 0,41 bar), Yellow
- □ 5 to 15 psig (0,34 to 1,0 bar), Green
- □ 13 to 25 psig (0,90 to 1,7 bar), Black

**High Temperature**
- □ 15 to 100 psig (1,0 to 6,9 bar), Unpainted
- □ 80 to 250 psig (5,5 to 17,2 bar), Unpainted

**Pilot Mounting Position (Select One)**

**Facing inlet side of main valve with diaphragm case up, pilot is mounted:**
- □ On left side with pilot adjusting screw pointed up
- □ On right side with pilot adjusting screw pointed up

**Options (Select One)**
- □ Standard Adjusting Screw
- □ Sealed Adjusting Screw
- □ Handwheel

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Ordering Guide (continued)

Safety Override System (Optional)
Type 6492HM Pilot Spring Range
- 10 to 30 psig (0.69 to 2.1 bar), Yellow
- 25 to 75 psig (1.7 to 5.2 bar), Green
- 70 to 150 psig (4.8 to 10.3 bar), Black
Type 6492HTM Pilot Spring Range
- 15 to 100 psig (1.0 to 6.9 bar), Unpainted
- 80 to 250 psig (5.5 to 17.2 bar), Unpainted
Main Valve Replacement Parts Kit (Optional)
- Yes, send one main valve replacement parts kit to match this order.
Replacement Pilot (Optional)
- Yes, send one replacement pilot to match this order.
Pilot Replacement Parts Kit (Optional)
- Yes, send one pilot replacement parts kit to match this order.
IAT CONSTRUCTION SERVICES INC.

GFS50

Glycol Feed System

Please record the following data:
(Information is located on the product label and packing slip)

Model Number: ________________________________
Serial Number: ________________________________
Installation Date: ____________________________
Installation Location / Application

The above information will help when ordering replacement parts for your IAT Construction Services Inc. Glycol Feed System.
Contents

1.0  Introduction
2.0  Warranty
3.0  Receiving
4.0  Installation
5.0  Startup
6.0  Operation
7.0  Maintenance
   7.1  Pressure Switch
   7.2  Gear Pump
   7.3  Tank and Plumbing
   7.4  Pressure Relief Valve
8.0  Glycol Feeder Diagram
9.0  Control Panel Wiring Diagram
10.0 Troubleshooting
11.0 Spare Parts
12.0 Reference Charts
   12.1 % Propylene Glycol
   12.2 % Ethylene Glycol
   12.3 Freeze Protection - Burst Protection
1.0 INTRODUCTION

The IAT Construction Services GFS50-1 Glycol Feeder provides a complete freestanding system to maintain pressure and glycol level in a closed loop system. Monitoring the pressure and adding a premixed glycol solution when the pressure drops below a preset value maintain the closed loop system pressure. When the system pressure increases above the pressure switch setpoint, the control unit will shut the glycol feed off.

Several safety features are included to ensure that the glycol pump runs only when it is supposed to. A back flow prevention valve is installed in the discharge of the pump. This prevents system solution from backing up in to the feed tank when the glycol pump is off. A low level cutoff switch is provided to prevent the pump from running when the supply tank is empty. The cutoff switch also activates an alarm buzzer and closes the alarm dry contacts. An adjustable pressure relief valve is installed in the discharge line. If system pressure increases beyond the limit set on the pressure relief valve, the valve opens, and the glycol solution is bypassed back into the solution tank.

The control panel is housed in a NEMA type enclosure and is pre-wired to include all electrical connections to the pump, pressure switch and level switch. An 18 gauge, 3 wire, 7' 6", 115VAC power cord is pre-wired and supplied with the system.

2.0 WARRANTY

IAT Construction Services, Inc. Glycol Feed Systems are guaranteed for one year, from the date of shipment, against manufacturing defects in material and workmanship that develop in the service for which they are designed. We will repair or replace defective material when returned to our factory with transportation prepaid; providing that the material is found to be defective upon inspection. We assume no liability for labor or other expenses in making repairs or adjustments. All replacements will be F.O.B. factory.

3.0 RECEIVING

When receiving and prior to unpacking the glycol feeder, please note the packaging is free from damage. If damage is detected, note on receiving paper from freight carrier. Unpack and inspect for damage. If damage is detected and was not noted with the freight carrier, contact the freight carrier immediately.

4.0 INSTALLATION

Select a location that is accessible to the closed loop and a 115 VAC power outlet. Utilizing the four 25/64" bolt holes, located at the base of each vertical support leg, firmly secure the Glycol Feed System to a level concrete pad. Be sure that the pad thickness complies with local codes. Install an isolation ball valve or gate valve at the discharge of
the Glycol Feed System. Plumb the discharge \(\frac{1}{2}\)” NPT port to the closed system. Connection to the system should be near the suction side of the circulating pump. To provide power, plug the Glycol Feed System in to a 115 VAC, 15 amp. minimum receptacle.

The series 530C adjustable relief valve is provided for pump and pump discharge-piping protection only. This valve is not intended to provide ASME approved relief for the closed loop system. Calibrated adjustments allows for setting the valve to the desired pressure relief in the range of 50 - 175 psi.

5.0 STARTUP

The Glycol Feeder System is set at the factory with start up settings of 14-psi cut-off and 5 psi cut-in. The pressure relief valve is set at 50 psi. Do not operate the glycol feeder above 75 psi. If your application requires a higher operating pressure, consult the factory. All of these settings are fully field adjustable.

1. Plug in control panel: Alarm buzzer and light on panel should be on due to low solution level. Add sufficient water to the tank to turn off the alarm. As the pump is locked out in the automatic mode when this alarm is on, do not drain the water until pressure switch adjustments have been made. The initial setting of the pressure switch is critical to the proper operation of the glycol feeder.
2. Set the HAND/OFF/AUTO switch to the AUTO position.
3. Remove the cover to make pressure switch adjustment.
4. Note: The pressure gauge on the piping allows you to see the operating pressure.
   a. Use the RANGE ADJUSTMENT(S) to set the ON point(s). Turn the RANGE nut clockwise to increase operating pressure, counterclockwise to decrease operating pressure.
   b. Use the DIFFERENTIAL ADJ. to set the cutout, or turnoff, point. Rotate clockwise to increase, counter clockwise to decrease differential.
5. You may need to repeat this step several times before the system is "fine tuned" to desired operating pressure.

6. Fill tank with a glycol mixture.

6.0 OPERATION

The system operates based on an operator set pressure set point. When pressure drops below the set point, the pump operates until the set point is satisfied.

A tank level monitor locks out pump operation when solution level falls below the level of the switch. In an alarm condition, a red light on the control panel illuminates and an audible alarm sounds. Remote alarm contacts also close on low level. Push the red alarm light/button to silence the audible alarm. Adding glycol solution to the tank will clear the alarm light and open the remote alarm contacts.
7.0 MAINTENANCE

7.1 Pressure Switch

7.1.1. The only maintenance required is periodic checks for wear on the contacts. Contacts can be replaced if damaged or worn.

1. Disassembly and Reassembly:
2. Remove wires from terminal block, note placement.
3. Unscrew pressure switch from discharge line.
4. Remove diaphragm screws, six
5. Remove contact block screws, two
6. Reassemble pressure switch in reverse order of disassembly.

7.2 Gear Pump

7.2.1. WARNING: Make certain that the power source is disconnected before attempting to service or disassemble any components! If the power disconnect is out-of-sight, lock it in the open position and tag to prevent application of power.

7.2.2. FEATURES:

1. Bronze Body
2. Helical Gears for Quiet Operation
3. Self-lubricating Carbon Bearings
4. Buna N Lip Seal
5. Carbonator Motor Mount

7.2.3. GENERAL DESCRIPTION:

1. The carbonator motor mounting uses a circular clamp, similar to a hose clamp, as a means of attaching the pump to a specially machined hub on the motor. The main advantages are compactness and economy due to the elimination of the adapter casting.

2. The rotary gear pump features an all bronze design and 303 stainless steel shafts. The built-in relief valve provides internal re-circulation to the suction side of the pump.

7.2.4. GENERAL:

1. Check the pump for proper operation daily, weekly, monthly, etc. If anything has changed (pump noise, motor noise, leaks, etc.) since the pump was new, the pump should be removed, examined and repaired if necessary. This is a difficult motor/pump to repair, therefore only qualified electricians or service technicians should attempt to repair this unit. Improper repair and/or assembly can cause problems with the electric motor used with unit.

7.2.5. LUBRICATION

1. Carbon bearing gear pumps require no lubrication.
2. Sleeve bearing motors require periodic re-oiling. Follow re-oiling instructions on the motor (See nameplate or terminal box cover). If instructions are not included, re-oil once a year with 10 - 15 drops of SAE #20 non-detergent or electric motor oil. Do not over lubricate.