City of Fairbanks
City Hall Heating System Replacement
Fairbanks, Alaska

Final Construction Documents

For:
Jeff Whipple
City of Fairbanks Engineering Dept.
800 Cushman St.,
Fairbanks, AK 99701

August 21, 2025

Design Alaska

City of Fairbanks
City Hall Heating System Replacement
Fairbanks, Alaska

Final Construction Documents

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- **Cutsheets**

By:
Design Alaska, Inc.
601 College Road
Fairbanks, Alaska 99701

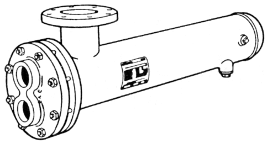
August 21, 2025

Bell & Gossett

SUBMITTAL

C-121.3B

JOB:	**REPRESENTATIVE:**	
UNIT TAG:	**ORDER NO.**	**DATE:**
ENGINEER:	**SUBMITTED BY:**	**DATE:**
CONTRACTOR:	**APPROVED BY:**	**DATE:**



10" Series
Type "SU" Heat Exchangers
"U" Tube Design

DESCRIPTION

B & G Types "SU" Heat Exchangers are of the shell and tube type. The tube bundle is of "U" bend construction with tube ends expanded into a stationary tube sheet. This construction permits ample expansion or contraction for wide temperature variations. A fluid entering the tubes is heated by steam condensing in the single pass shell. Tube spacers properly support and space each tube for maximum efficiency in steam condensation and drainage.

Standard "SU" Heat Exchangers are construced according to ASME requirements for pressure and temperatures

A Manufacturers' Data Report for Pressure Vessels, Form No. U-1, as required by the preovisionsof the ASME Code Rules, is furniahed with each unit upon request. This form is signed by an authorized inspector, holding a national Board Commision, and who is employed by an authorized inspection agency, certifying that construction conforms to the latest ASME code for pressure vessels. The ASME "U" symbol is stamped on each vessel. In addition, each unit is registered with the national Board of Boiler and pressure Vessel Inspectors.

RECOMMENDED "SU" HEAT EXCHANGER

MODEL NO. _____ **HEATING SURFACE (SQ. FT.)** _____

	TUBE SIDE	SHELL SIDE
1. Steam Pressure		
2. Fluid Circulated		
3. Total Flow (Expressed in GPM, GRH or lbs./hr)		
4. Teperature In/Out		
5. Heat Load BTU/hr		
6. Pressure Drop (Maximum)		
7. Fouling Factor or Percentage of Additional Surface		
Note: Following applies only to fluids other than water.		
8. Specific Gravity		
9. Specific Heat		
10. Latent Heat		
11. Viscosity**		
12. Thermal Conductivity		

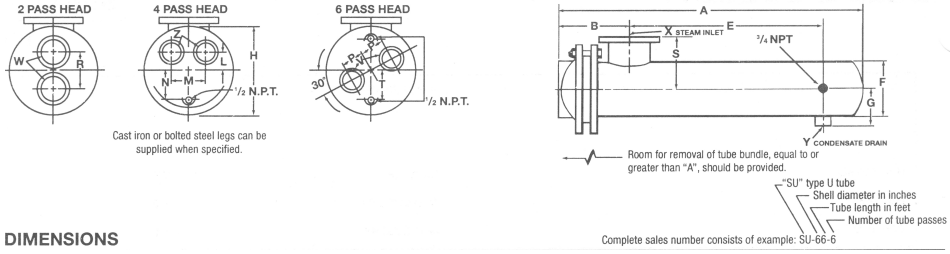
APPROVALS

**Expressed in Proper Units and Temperature such as centipoises @ °F

xylem
Let's Solve Water

12" Series Type "SU" Heat Exchangers "U" Tube Design

C-121.4D



DIMENSIONS

UNIT NUMBER.	DIMENSIONS IN INCHES											HEATING SURFACE	APPROX. SHIPPING WEIGHT
	2 PASS		2 AND 4 PASS										
	W	R	A	B	E	F	G	H	S	X	Y		
SU102-2	4NPT	5-7/8(149)	29(737)	10(254)	11-3/4(298)	10-3/4(273)	6-1/2(165)	14-5/8(371)	6-3/4(171)	3NPT	1NPT	27 (2.5)	184 (83)
SU103-2	4NPT	5-7/8(149)	41(1041)	10(254)	23-3/4(603)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	4FLG	1NPT	42 (3.9)	230 (104)
SU104-2	4NPT	5-7/8(149)	53(1346)	10(254)	35-3/4(908)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	4FLG	1.25NPT	56 (5.2)	276 (125)
SU105-2	4NPT	5-7/8(149)	65(1651)	10(254)	47-3/4(1213)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	6FLG	1.25NPT	71 (6.6)	322 (146)
SU106-2	4NPT	5-7/8(149)	77(1956)	10(254)	59-3/4(1518)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-3/4(248)	6FLG	1.5NPT	86 (8)	368 (167)
SU107-2	4NPT	5-7/8(149)	89(2261)	10(254)	71-3/4(1822)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	6FLG	1.5NPT	101 (9.4)	414 (188)
SU108-2	4NPT	5-7/8(149)	101(2565)	10(254)	83-3/4(2127)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	6FLG	2NPT	116 (10.8)	460 (209)
SU109-2	4NPT	5-7/8(149)	113(2870)	10(254)	95-3/4(2432)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	6FLG	2NPT	131 (12.2)	506 (230)
SU1010-2	4NPT	5-7/8(149)	125(3175)	10(254)	107-3/4(2737)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	6FLG	2NPT	146 (13.6)	552 (250)

UNIT NUMBER.	DIMENSIONS IN INCHES													HEATING SURFACE	APPROX. SHIPPING WEIGHT
	4 PASS				2 AND 4 PASS										
	L	M	N	Z	A	B	E	F	G	H	S	X	Y		
SU102-4	2-3/8(60)	4-3/4(121)	4-3/8(111)	3NPT	29(737)	10(254)	11-3/4(298)	10-3/4(273)	6-1/2(165)	14-5/8(371)	6-3/4(171)	3NPT	1NPT	25 (2.3)	184 (83)
SU103-4	2-3/8(60)	4-3/4(121)	4-3/8(111)	3NPT	41(1041)	10(254)	23-3/4(603)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	4FLG	1NPT	39 (3.6)	230 (104)
SU104-4	2-3/8(60)	4-3/4(121)	4-3/8(111)	3NPT	53(1346)	10(254)	35-3/4(908)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	4FLG	1.25NPT	53 (4.9)	276 (125)
SU105-4	2-3/8(60)	4-3/4(121)	4-3/8(111)	3NPT	65(1651)	10(254)	47-3/4(1213)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	6FLG	1.25NPT	68 (6.3)	322 (146)
SU106-4	2-3/8(60)	4-3/4(121)	4-3/8(111)	3NPT	77(1956)	10(254)	59-3/4(1518)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-3/4(248)	6FLG	1.5NPT	82 (7.6)	368 (167)
SU107-4	2-3/8(60)	4-3/4(121)	4-3/8(111)	3NPT	89(2261)	10(254)	71-3/4(1822)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	6FLG	1.5NPT	96 (8.9)	414 (188)
SU108-4	2-3/8(60)	4-3/4(121)	4-3/8(111)	3NPT	101(2565)	10(254)	83-3/4(2127)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	6FLG	2NPT	110 (10.2)	460 (209)
SU109-4	2-3/8(60)	4-3/4(121)	4-3/8(111)	3NPT	113(2870)	10(254)	95-3/4(2432)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	6FLG	2NPT	124 (11.5)	506 (230)
SU1010-4	2-3/8(60)	4-3/4(121)	4-3/8(111)	3NPT	125(3175)	10(254)	107-3/4(2737)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	6FLG	2NPT	138 (12.8)	552 (250)

UNIT NUMBER.	DIMENSIONS IN INCHES												HEATING SURFACE	APPROX. SHIPPING WEIGHT
	6 PASS													
	P	T	V	A	B	E	F	G	H	S	X	Y		
SU102-6	3-13/16(97)	4-7/8(124)	2.5NPT	29(737)	10(254)	11-3/4(298)	10-3/4(273)	6-1/2(165)	14-5/8(371)	6-3/4(171)	3NPT	1NPT	21 (2)	184 (83)
SU103-6	3-13/16(97)	4-7/8(124)	2.5NPT	41(1041)	10(254)	23-3/4(603)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	4FLG	1NPT	33 (3.1)	230 (104)
SU104-6	3-13/16(97)	4-7/8(124)	2.5NPT	53(1346)	10(254)	35-3/4(908)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	4FLG	1.25NPT	45 (4.2)	276 (125)
SU105-6	3-13/16(97)	4-7/8(124)	2.5NPT	65(1651)	10(254)	47-3/4(1213)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	6FLG	1.25NPT	56 (5.2)	322 (146)
SU106-6	3-13/16(97)	4-7/8(124)	2.5NPT	77(1956)	10(254)	59-3/4(1518)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-3/4(248)	6FLG	1.5NPT	68 (6.3)	368 (167)
SU107-6	3-13/16(97)	4-7/8(124)	2.5NPT	89(2261)	10(254)	71-3/4(1822)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	6FLG	1.5NPT	80 (7.4)	414 (188)
SU108-6	3-13/16(97)	4-7/8(124)	2.5NPT	101(2565)	10(254)	83-3/4(2127)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	6FLG	2NPT	92 (8.5)	460 (209)
SU109-6	3-13/16(97)	4-7/8(124)	2.5NPT	113(2870)	10(254)	95-3/4(2432)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	6FLG	2NPT	104 (9.7)	506 (230)
SU1010-6	3-13/16(97)	4-7/8(124)	2.5NPT	125(3175)	10(254)	107-3/4(2737)	10-3/4(273)	6-1/2(165)	14-5/8(371)	9-7/8(251)	6FLG	2NPT	116 (10.8)	552 (250)

Dimensions are subject to change. If exact dimensions are needed for layout, write for certified prints.

DESIGN PRESSURES - ASME CONSTRUCTION
CAST IRON & BRASS UNITS

DESIGN PRESSURES				DESIGN TEMPERATURES*	
TUBE SIDE		SHELL SIDE		TUBE & SHELL SIDE	
DESIGN	TEST	DESIGN	TEST	CAST IRON	BRASS
4 & 6 Pass					
150 psi	300 psi	150 psi	300 psi	375 °F	300 °F
2 Pass					
125 psi	250 psi	150 psi	300 psi	375 °F	300 °F
2 Pass Head (Flanged Connections) Cast Iron Only					
150 psi	300 psi	150 psi	300 psi	375 °F	–

*For design pressures and temperatures higher than shown,
consult B & G Representative for specifications and dimensions.

MATERIALS

PART	STANDARD CAST IRON UNIT	BRASS UNIT
	2, 4 & 6 Pass	**2 & 4 Pass**
Head	Cast Iron	Cast Brass
Shell	Steel	Steel
Tube Sheets	Steel	Royal Naval Brass
Tubing	Cooper 3/4" O.D.	Cooper 3/4" O.D.
Tube Supports	Steel	Steel
Nuts & Bolts	Steel	Steel

TYPICAL INSTALLATION OF "SU" HEAT EXCHANGER

Steam Hammer can cause serious damage to the tubes of any Heat

HX-1

Bell & Gossett™

Shell & Tube Heat Exchanger Specification Sheet

175 Standard Parkway
Cheektowaga, New York 14227
1-888-488-4404
www.xylem.com/bellgossett

Customer		Date	Wednesday, August 20, 2025
Inquiry Number	070514	Item Number	NA

Performance of One Unit: QSUS-1030-2 **Units Connected in Parallel:** 1

	Shell Side	Tube Side
Fluid Name	Steam	Propylene Glycol 50%
Total Flow	1,181.47 lb/hr	166 GPM
Inlet Temperature	217.8 °F	164.5 °F
Outlet Temperature	217.8 °F	180.0 °F
Operating Pressure	2 PSIG	22 PSIG
Pressure Drop, Allow./Calc	3.34 / 0.17 PSIG	6.5 / 0.95 PSIG
Velocity	48.98 ft/s	3.65 ft/s
Density	0.04 lb/ft3	62.21 lb/ft3
Viscosity, Mean	0.01 cp	1.14 cp
Viscosity, Wall	0.01 cp	1.1 cp
Specific Heat	0.49 Btu/lbm,°F	0.89 Btu/lbm,°F
Thermal Conductivity	0.01 Btu/ft,h,°F	0.22 Btu/ft,h,°F
Specified Fouling Factor	0.000000 hr,ft2,°F/Btu	0.000500 hr,ft2,°F/Btu

Total Heat Exchanged	1,150,000	Btu/h
LMTD	45.11	°F
Overall Heat Transfer Coefficient, Clean/Dirty	517.27/398.38	Btu/hr,ft2,°F
Overall Heat Transfer Coefficient, Service	259.1	Btu/hr,ft2,°F
Surface Area	98.3	ft2
Excess Surface Area	53.76	%

Construction

	Shell Side	Tube Side
Number of Passes	1	2
Design Pressure	150PSI	125PSIG
Design Temperature	375(°F)	375(°F)
Inlet Connection (Location) Type	3.0 in NPT	4.0 in NPT
Outlet Connection (Location) Type	0.75 in NPT	4.0 in NPT

Tube Material / Diameter	COPPER / 3/8 in
No. Tubes / Gauge / Length / Pitch	352 / 23 BWG / 30 / 0.453 TRI
Shell Material	STEEL
Head Type/Material	CAST IRON
Tubesheet Material	STEEL
Baffle Material	STEEL
Gasket Material	COMP.FIBER
Tube to Tubesheet Joint	Roller Expanded
Approvals	ASME Sect VIII Div 1 w/U stamp.

- Customer to verify fluid/material compatibility.

Performance evaluation is dependent on customers' ability to provide sufficiently accurate measurements.
NOTES:

Blake Burley

Version No.: V2547

Bell & Gossett™

Shell & Tube Heat Exchanger Specification Sheet

HX-1 - ALTERNATE DUTY POINT

175 Standard Parkway
Cheektowaga, New York 14227
1-888-488-4404
www.xylem.com/bellgossett

Customer		Date	Tuesday, August 19, 2025
Inquiry Number	070357	Item Number	NA

Performance of One Unit: QSUS-1030-2 **Units Connected in Parallel:** 1

	Shell Side	Tube Side
Fluid Name	Steam	Propylene Glycol 50%
Total Flow	1,952 lb/hr	235 GPM
Inlet Temperature	217.8 °F	161.9 °F
Outlet Temperature	217.8 °F	180.0 °F
Operating Pressure	2 PSIG	0 PSIG
Pressure Drop, Allow./Calc	3.34 / 0.25 PSIG	6.5 / 1.75 PSIG
Velocity	80.92 ft/s	5.16 ft/s
Density	0.04 lb/ft3	62.25 lb/ft3
Viscosity, Mean	0.01 cp	1.16 cp
Viscosity, Wall	0.01 cp	1.12 cp
Specific Heat	0.49 Btu/lbm,°F	0.89 Btu/lbm,°F
Thermal Conductivity	0.01 Btu/ft,h,°F	0.22 Btu/ft,h,°F
Specified Fouling Factor	0.000000 hr,ft2,°F/Btu	0.000500 hr,ft2,°F/Btu

Total Heat Exchanged	1,900,000 Btu/h
LMTD	46.26 °F
Overall Heat Transfer Coefficient, Clean/Dirty	645.57/470.38 Btu/hr,ft2,°F
Overall Heat Transfer Coefficient, Service	417.43 Btu/hr,ft2,°F
Surface Area	98.3 ft2
Excess Surface Area	12.69 %

Construction

	Shell Side	Tube Side
Number of Passes	1	2
Design Pressure	150PSI	125PSIG
Design Temperature	375(°F)	375(°F)
Inlet Connection (Location) Type	4.0 in FLG 150#	4.0 in NPT
Outlet Connection (Location) Type	0.75 in NPT	4.0 in NPT

Tube Material / Diameter	COPPER / 3/8 in
No. Tubes / Gauge / Length / Pitch	352 / 23 BWG / 30 / 0.453 TRI
Shell Material	STEEL
Head Type/Material	CAST IRON
Tubesheet Material	STEEL
Baffle Material	STEEL
Gasket Material	COMP.FIBER
Tube to Tubesheet Joint	Roller Expanded
Approvals	ASME Sect VIII Div 1 w/U stamp.

- Customer to verify fluid/material compatibility.

Performance evaluation is dependent on customers' ability to provide sufficiently accurate measurements.
NOTES:

Blake Burley

Version No.: V2547

Bell & Gossett
a xylem brand

P-1A/B

Submittal

Job/Project:	**Representative:** Columbia Hydronics Corp	
ESP-Systemwize: WIZE-FF7A6D96 **Created On:** 08/19/2025	**Phone:** 360-883-2600	
Location/Tag:	**Email:** salescol@chchydro.com	
Engineer:	**Submitted By:**	**Date:**
Contractor:	**Approved By:**	**Date:**

Close Coupled In-Line Centrifugal Pump

Series: e-80

Model: 2.5x2.5x9.5C

Features & Design

- Best in Class Hydraulic Performance
- Low Operating and Maintenance Cost
- Horizontal or Vertical Installation

The Series e-80 is a highly efficient, heavy duty, close coupled pump designed for horizontal or vertical in-line mounting. The e-80 is available in stainless steel fitted construction, with flows up to 2500 GPM, heads to 380 feet.

http://bellgossett.com/pumps-circulators/in-line-pumps/series-e-80/

Pump Selection Summary

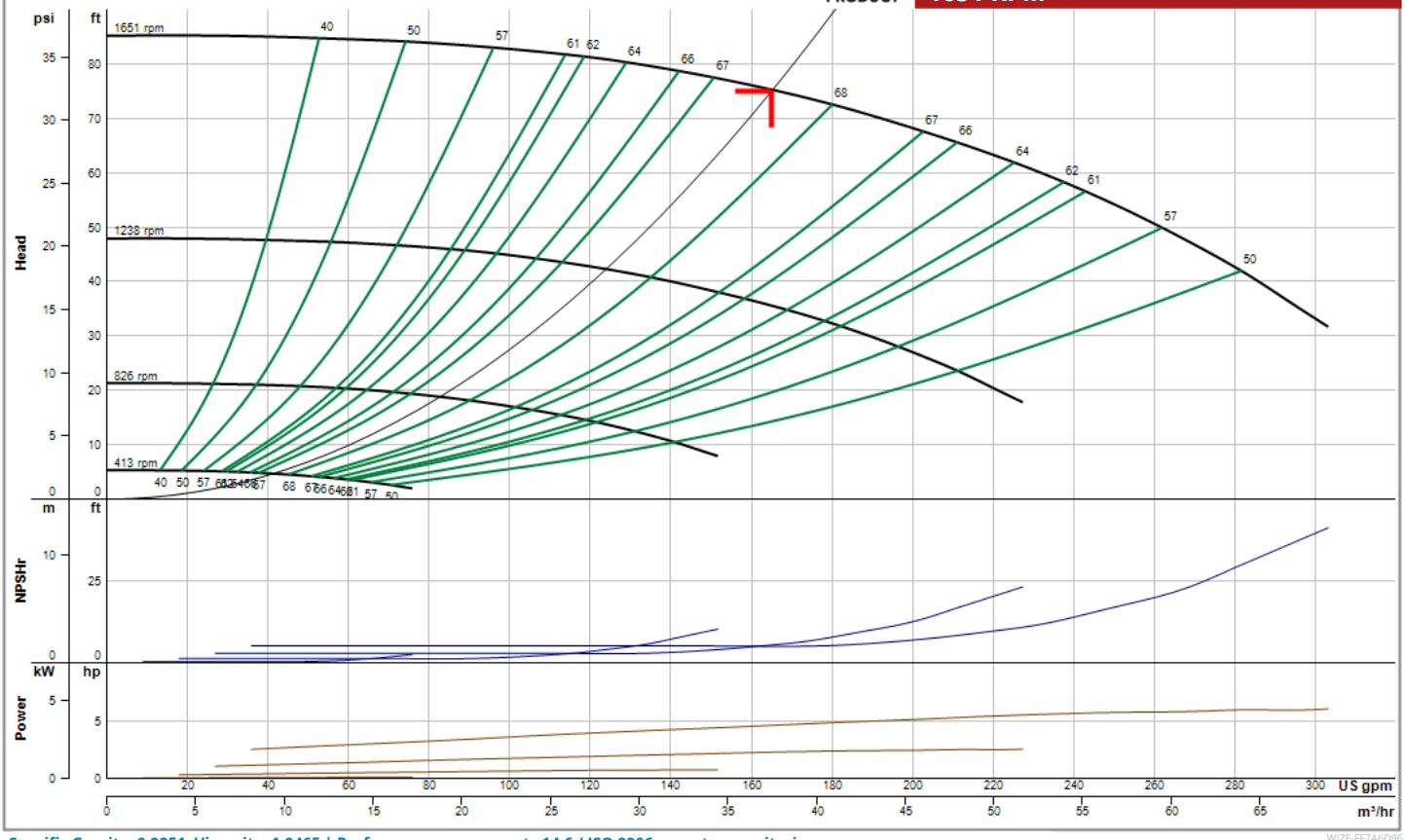
Duty Point Flow	165 US gpm
Duty Point Head	75 ft
Control Head	0 ft
Duty Point Pump Efficiency	67.4 %
Part Load Efficiency Value (PLEV)	67.5 %
Impeller Diameter	9.5 in
Motor Power	7.5 hp
Duty Point Power	4.6 bhp
Motor Speed	1800 rpm
RPM @ Duty Point	1651 rpm
NPSHr	5.23 ft
Minimum Shutoff Head	85.2 ft
Minimum Flow at RPM	36 US gpm
Flow @ BEP	180 US gpm
Fluid Temperature	180 °F
Fluid Type	50% Propylene glycol
Weight *(approx. - consult rep for exact)*	280 lbs
Pump Floor Space Calculation	2.42 ft²

Performance Curve

Energy Efficiency Ratings:
Pump & Motor PEIcl: 0.92 ERcl: 8
Pump, Motor & Drive: PEIvl: 0.46 ERvl: 54

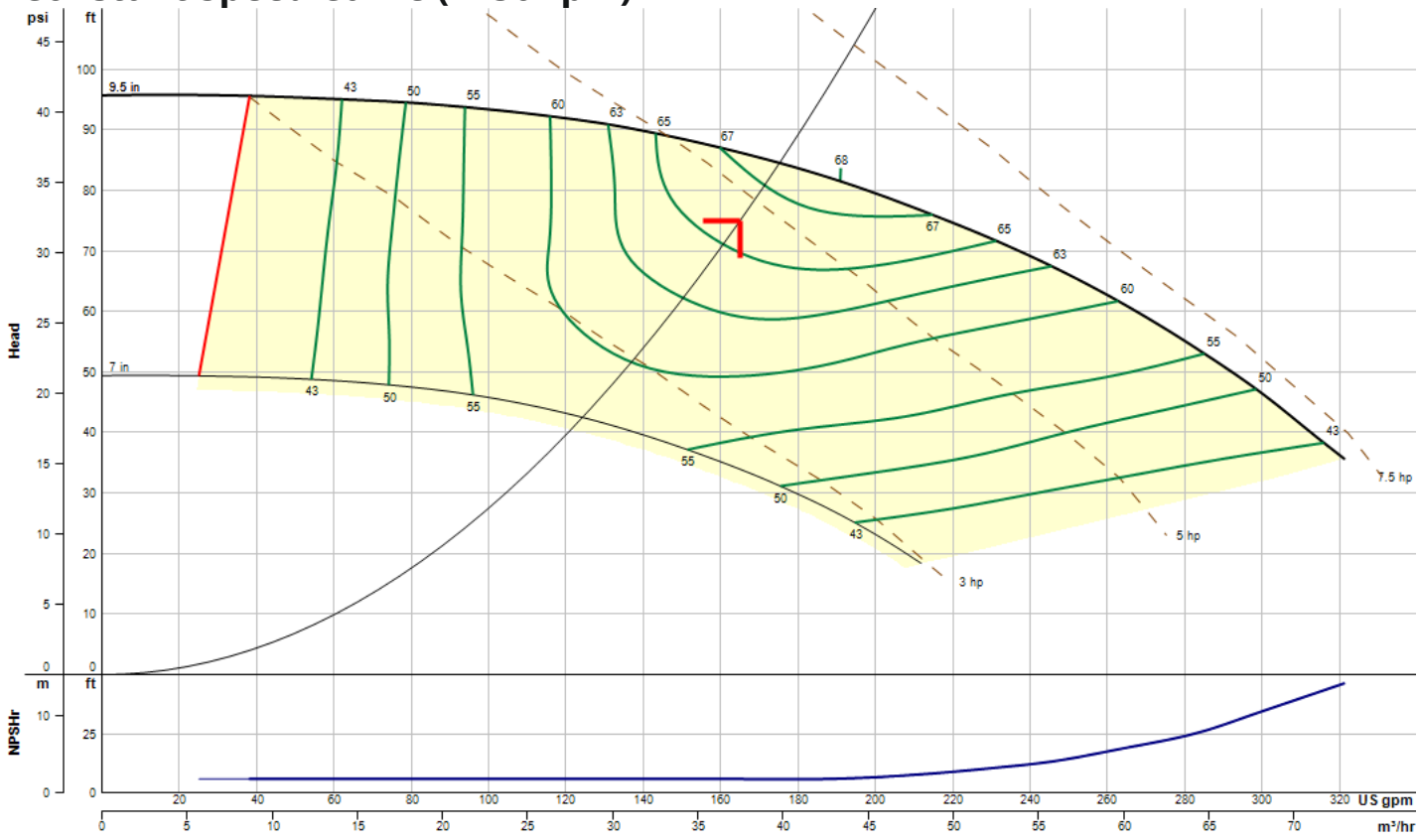
PREMIUM EFFICIENCY PRODUCT

e-80
2.5x2.5x9.5C
1651 RPM



Specific Gravity: 0.9951, Viscosity: 1.0465 | Performance curve meets 14.6 / ISO 9906 acceptance criteria

Constant Speed Curve (1750 rpm)



Operating Point

Flow: 165 US gpm **Head:** 75.1 ft **Speed:** 1651 **Efficiency:** 67.4% **Point BHP:** 4.6 **End Of Curve:** 54.5%

Maximum Duty Point (at rated motor speed)

Flow: 175 US gpm **Head:** 84.4 ft **Speed:** 1750 **Efficiency:** 67.5% **Point BHP:** 5.47 **NOL Flow:** 321 US gpm **Runout Flow:** 321 US gpm **NOL (BHP):** 7.17

Bell & Gossett
a xylem brand

P-1A/B - ALTERNATE DUTY POINT

Submittal

Job/Project:	**Representative:** Columbia Hydronics Corp	
ESP-Systemwize: WIZE-9AB700F6 **Created On:** 08/20/2025	**Phone:** 360-883-2600	
Location/Tag:	**Email:** salescol@chchydro.com	
Engineer:	**Submitted By:**	**Date:**
Contractor:	**Approved By:**	**Date:**

Close Coupled In-Line Centrifugal Pump

Series: e-80

Model: 2.5x2.5x9.5C

Features & Design

- Best in Class Hydraulic Performance
- Low Operating and Maintenance Cost
- Horizontal or Vertical Installation

The Series e-80 is a highly efficient, heavy duty, close coupled pump designed for horizontal or vertical in-line mounting. The e-80 is available in stainless steel fitted construction, with flows up to 2500 GPM, heads to 380 feet.

http://bellgossett.com/pumps-circulators/in-line-pumps/series-e-80/

Pump Selection Summary

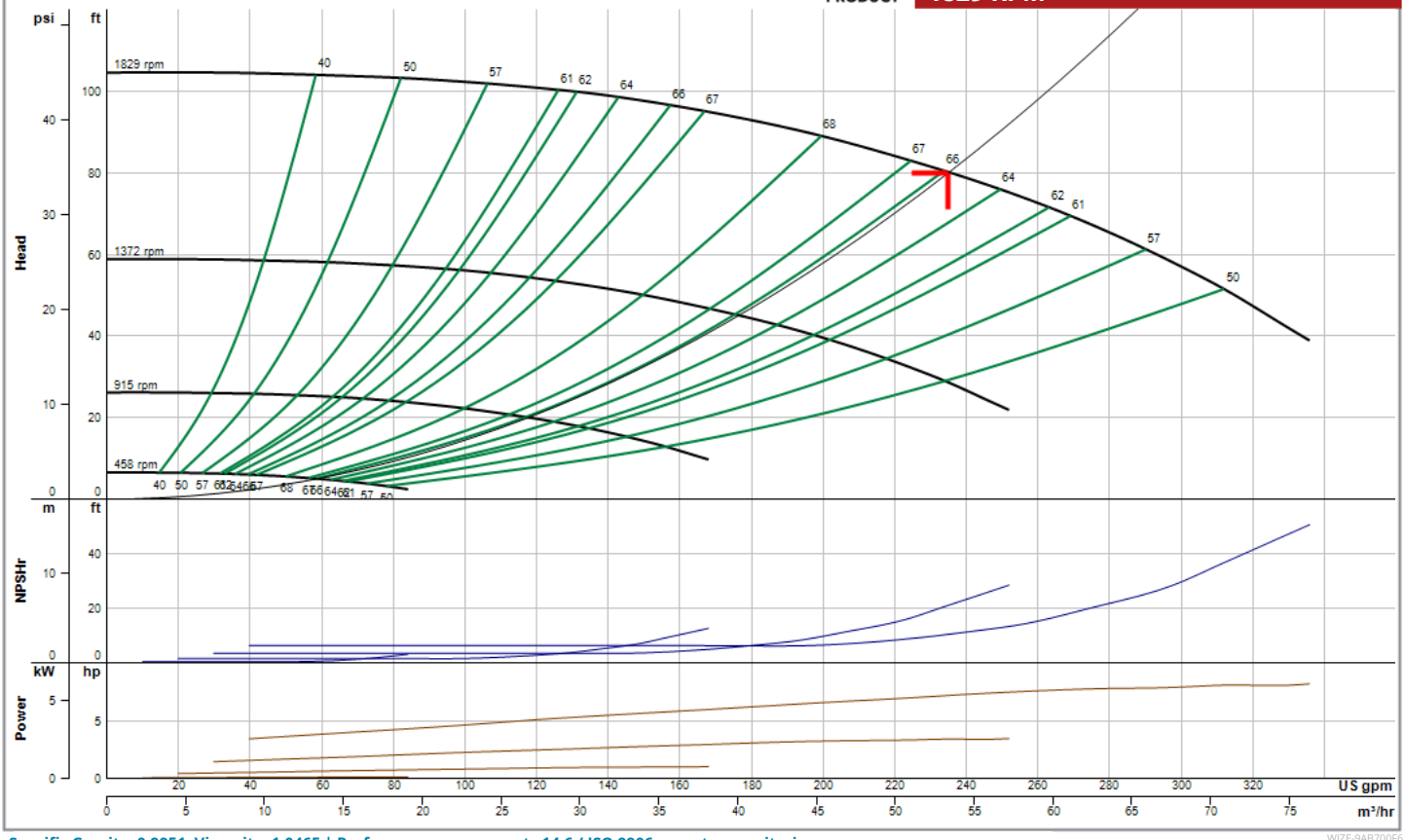
Duty Point Flow	235 US gpm
Duty Point Head	80 ft
Control Head	0 ft
Duty Point Pump Efficiency	65.8 %
Part Load Efficiency Value (PLEV)	65.8 %
Impeller Diameter	9.5 in
Motor Power	7.5 hp
Duty Point Power	7.18 bhp
Motor Speed	1800 rpm
RPM @ Duty Point	1829 rpm
NPSHr	10.6 ft
Minimum Shutoff Head	105 ft
Minimum Flow at RPM	39.9 US gpm
Flow @ BEP	200 US gpm
Fluid Temperature	180 °F
Fluid Type	50% Propylene glycol
Weight *(approx. - consult rep for exact)*	280 lbs
Pump Floor Space Calculation	2.42 ft²

Performance Curve

Energy Efficiency Ratings:
Pump & Motor PEIcl: 0.92 ERcl: 8
Pump, Motor & Drive: PEIvl: 0.46 ERvl: 54

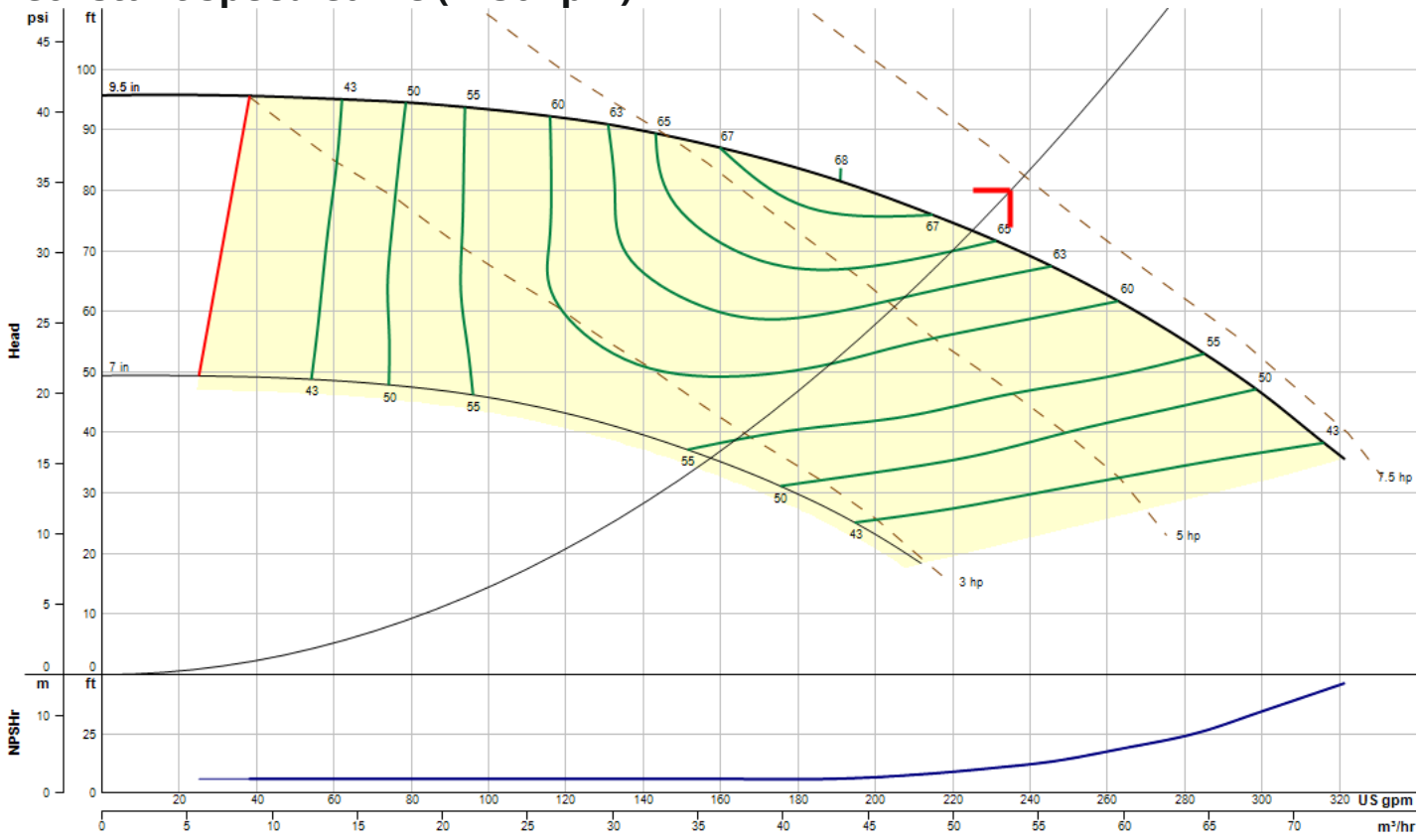
PREMIUM EFFICIENCY PRODUCT

e-80
2.5x2.5x9.5C
1829 RPM



Specific Gravity: 0.9951, Viscosity: 1.0465 | Performance curve meets 14.6 / ISO 9906 acceptance criteria

Constant Speed Curve (1750 rpm)

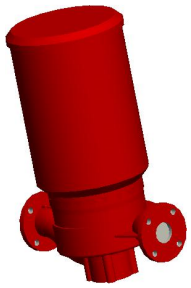


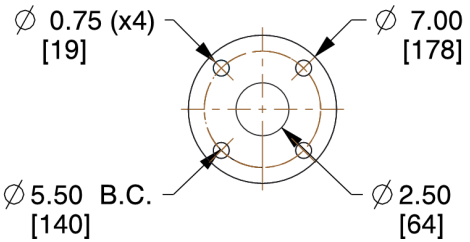
Operating Point

Flow: 235 US gpm **Head:** 80.1 ft **Speed:** 1829 **Efficiency:** 65.8% **Point BHP:** 7.18 **End Of Curve:** 70%

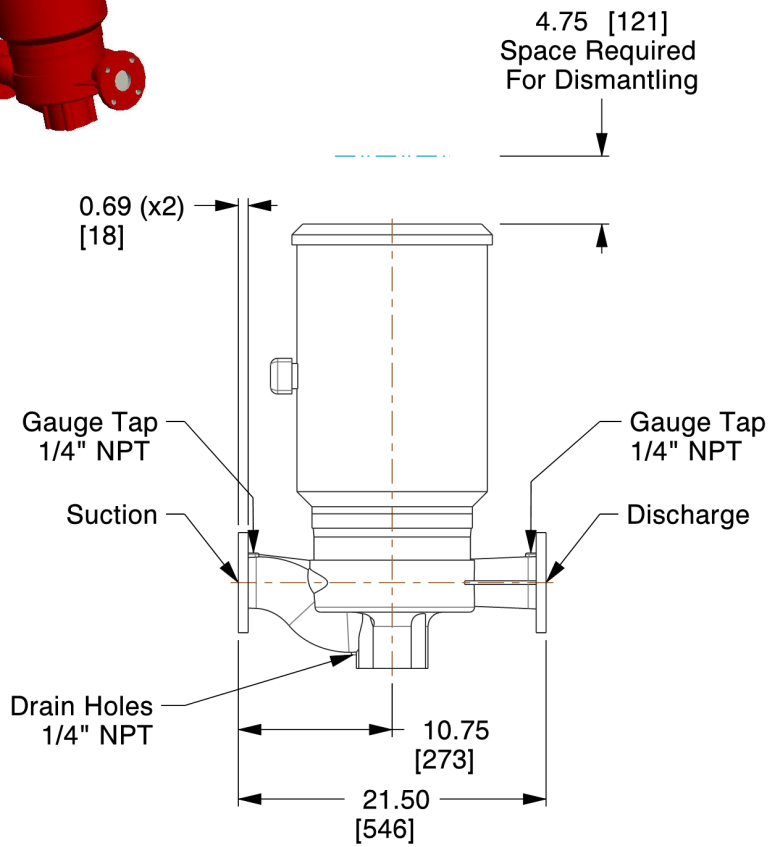
Maximum Duty Point (at rated motor speed)

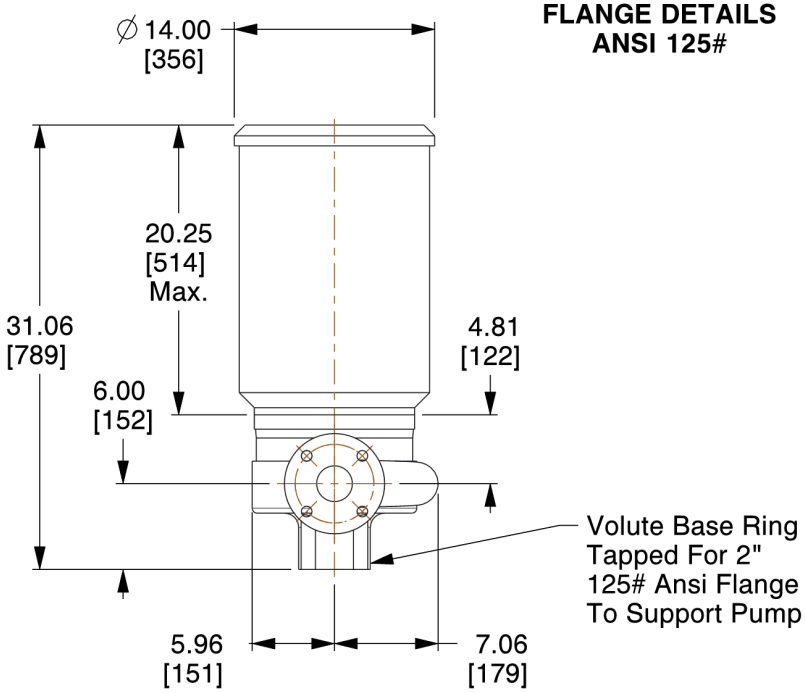
Flow: 225 US gpm **Head:** 73.3 ft **Speed:** 1750 **Efficiency:** 65.8% **Point BHP:** 6.29 **NOL Flow:** 321 US gpm **Runout Flow:** 321 US gpm **NOL (BHP):** 7.17





2.5" SUCTION & DISCHARGE FLANGE DETAILS ANSI 125#





Bell & Gossett
a xylem brand

8200 N. Austin Ave.
Morton Grove, IL 60053, USA

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Dimensions are subject to change

Not to be used for construction unless certified

BG-E80-2.5x2.5x9.5C-SS213JM-1-IN

Series e-80 Close Coupled In-Line Centrifugal Pump

Seal Type:Standard Seal | Motor Frame:213JM | Flange:ANSI 125#

Dimensions : IN (mm)	Scale : N.T.S.	Submittal # : B-139.10B

WMZE-FF7A6096

Standard Materials of Construction

Construction:	Stainless Steel Fitted Pump
1 Shaft:	Carbon Steel
2 Volute:	Cast Iron ASTM A48 Class B
3 Impeller:	ASTM A743 Grade CF8 - 304 Stainless Steel
4 Shaft Sleeve:	Stainless Steel
5 Impeller Key:	#304 Stainless Steel
6 Impeller Washer:	Carbon Steel
7 Impeller Lock Washer:	#304 Stainless Steel
8 Impeller Cap Screw:	#304 Stainless Steel
9 Volute Gasket:	Cellulose Fiber

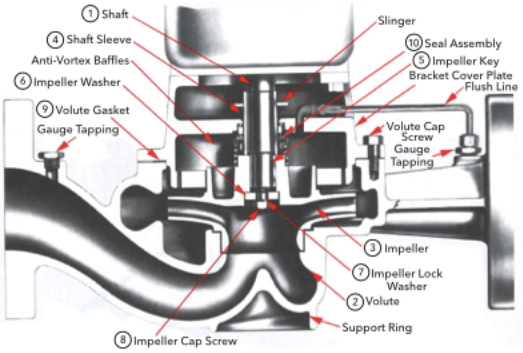
Pump Options *contact your local rep to configure

10 Standard Mechanical Seal Assembly

Bellows	Buna N
Faces	Carbon-Ceramic
Metal Parts	Brass or Stainless Steel
Spring	Stainless Steel

Maximum Working Pressure

Max Working Pressure (standard)	175 psi (12 bar)
Max Working Pressure (optional)	175#, 250#, and 300# working pressure designs.



TECHNOLOGIC STANDARD FEATURES	
CONTROL METHOD WITH INTEGRATED TECHNOLOGIC® SENSORLESS CONTROL (ITSC)	Factory configured for sensorless operation.
CONTROL METHOD WITH INTEGRATED TECHNOLOGIC® (IT)	Field configurable for sensor by others, building management system input, or optional sensor(s) provided.
ENCLOSURE	NEMA 12 (same as IP55 & UL type 12)
POWER DISCONNECT SWITCH	Included standard. Fused Disconnect Switch optional with three phase input voltage.
HARMONIC SUPPRESSION	Integrated non-saturating dual DC link reactors provide better harmonic performance than a 5% AC line reactor.
COOLING	Fan-cooled through temperature controlled and easy replacement.
AMBIENT TEMPERATURE RATING	14°F to 113°F (-10°C to 45°C)
COMMUNICATION PROTOCOLS	BACnet, Modbus RTU, N2 Metasys, FLN Apogee
ANALOG INPUTS	2 configurable for either voltage (0 to 10VDC) or current(0/4 to 20mA)
ANALOG OUTPUTS	1 (0/4 to 20mA) up to 500 ohm load accurate to 1% of full scale
DIGITAL INPUTS	4 (0 to 24VDC), NPN or PNP, 0 to 24VDC, on 5 msec scan interval, Up to 2 can be configured as pulse inputs.
DIGITAL OUTPUTS	2 (0 to 24VDC), 40mA max current, configurable as pulse outputs.
RELAY OUTPUTS	2 programmable, 240VAC or 400VAC up to 2 A
MINIMUM CONTROL HEAD	_____ ft (default set to 40% of design head if not unknown)

xylem
Let's Solve Water

Xylem Inc.
8200 N. Austin Avenue, Morton Grove, IL 60053
Phone: (847)966-3700 Fax: (847)965-8379
www.bellgossett.com

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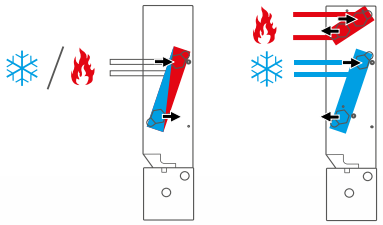
World's slimmest fan coil

- wall and ceiling installation
- 2-or 4-Pipe system
- heating and / or cooling
- with or without enclosure
- easy installation
- 24VDC EC motor
- silent, powerful, economical, sustainable



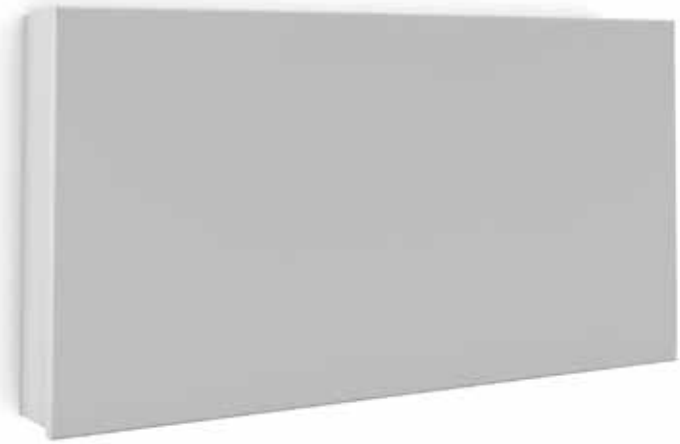
2-PIPE 4-PIPE

Ceiling

Wall

Built-In Ceiling

Built-In Wall



BRIZA EC 12 HYBRID

HEATING AND COOLING

CE

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jagaHybridHeating

BRIZA EC 12 HYBRID

- with EC motor: faster, more powerful, more economical, more sustainable
- 0...10V control
- heating and /or cooling
- wall or ceiling, recessed or surface mounted
- built-in: 2 heights (38 or 52 cm) (14 61/64" or 20 15/32"), 4 lengths
- surface mounted with enclosure: 2 heights (41 or 55 cm) (16 9/64" or 21 21/32"), 4 lengths
- 2-Pipe of 4-Pipe- system
- easy installation
- Hydronic heating and cooling system: no refrigerant inside the building

"Electronic commutation or EC technology":intelligent, low energy use and ECO-friendly.

With the introduction of the electronic commutation or EC motors, we take the next step into the direction of low energy consumption, less noise and a longer lifetime.

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BRIZA EC 12 HYBRID composition

New generation fans with energy-efficient operation:

Due to higher efficiency of the EC-motors, the power consumption is directly linked to the fan speed and thus airflow. The actual power consumption is determined by the (variable) speed and can be minimized by intelligent controls.

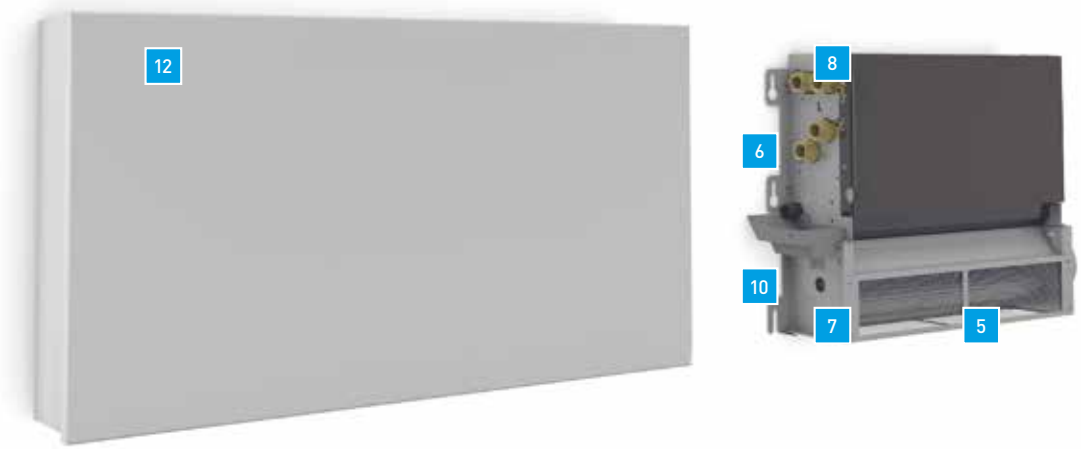
Product description:

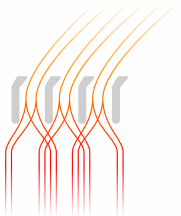
- energy-saving EC motor
- heating & cooling
- 4 lengths, 2 heigths
- 2-pipe system or 4-pipe system
- electronic speed control with 0 ... 10V signal
- suitable for sensible and total cooling by means of chilled water
- hydraulic connection left, electrical connection to the right. Optional available with hydraulic connection right and electrical connection to the left.
- 0...10V connection for BMS

Options:

- secondary coil for heating with 4-pipe system
- additional condensate tray ceiling
- 90° air outlet for recessed units
- power supplys
- On/off controller with water temperature sensor

Composition





Dynamic discharge grille 11

ATTENTION!

The direction of the air flow is determined by the shape of the fins in the grille. Position the exhaust grille in the way that the air is directed into the room.

Composition Briza Wall & Ceiling surface	
10	Condensate drain tray wall model is included as standard
11	Dynamic return grille for wall and ceiling model with casing
12	Enclosure for wall and ceiling model

Composition Briza Wall & Ceiling (Built-In)	
1	Dynamic heat exchanger
2	Condensate tray ceiling model
3	Optional secondary condensate drain tray, only for built-in ceiling
4	Hydraulic connection: 3/4" NPT, Standard left
5	Stainless steel fan guard
6	Mounting holes
7	Tangential fan
8	Frame of galvanized steel
9	Electrical connection 24VDC

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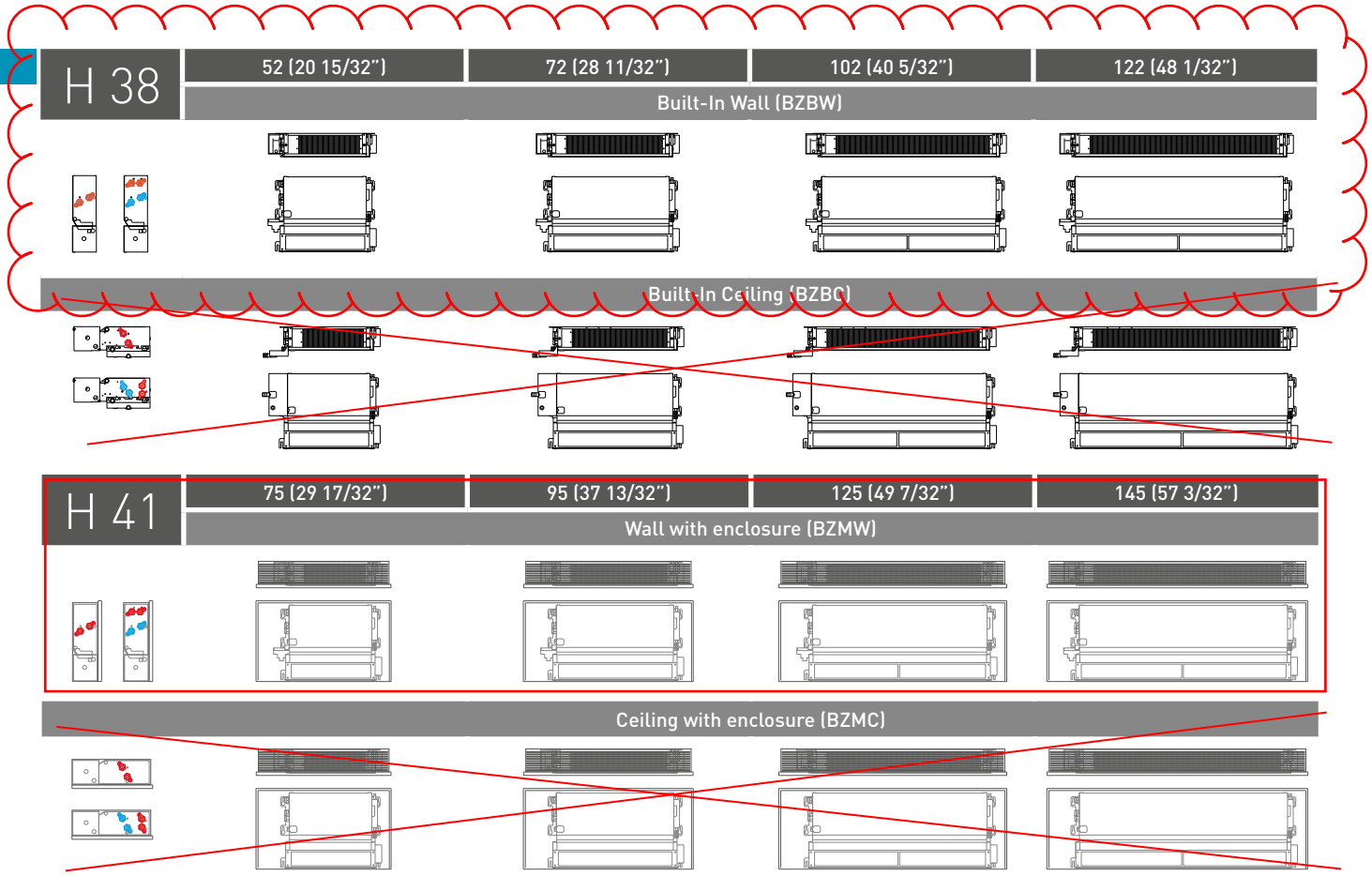
BRIZA EC 12 HYBRID general technical data / H38 / H41



example ORDER CODE 2-PIPE:

CODE	height	length	color	connection
BZMW	. 041	095	. XXX	/20

color code (fill in)

BRIZA EC HYBRID H38 / H41 Built-In general technical data

		L >	52/75	72/95	102/125	122/145
Power supply	V		24V			
Length (L)	cm		52/75	72/95	102/125	122/145
	inch		20.47"/29.52"	28.34"/37.40"	40.15"/49.21"	48.03"/57.08"
Height	cm		38/41			
	inch		14.96"/ 16.14"			
Dept	cm		12			
	inch		4.72"			
Connection standard coil	inch		3/4" NPT			
Connection secondary coil	inch					
Connection for the condensate drain	inch		0.78"			
Water content standard coil	Liter		0.15	0.25	0.4	0.5
	US Gallon		0.039	0.066	0.105	0.132
Water content secondary coil	Liter		0.15	0.25	0.40	0.50
	US Gallon		0.039	0.066	0.105	0.132

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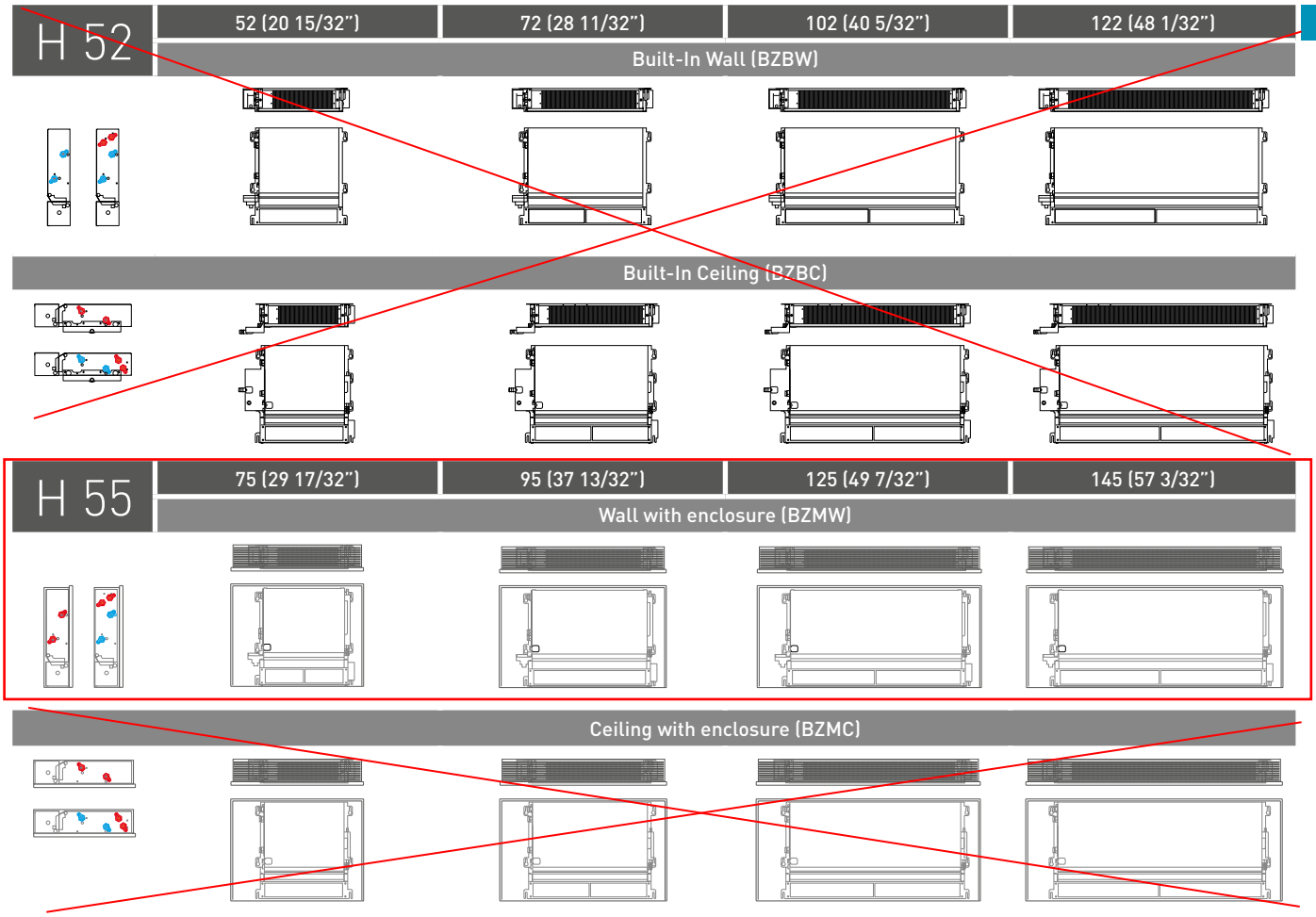
BRIZA EC 12 HYBRID general technical data / H52 / H55



example ORDER CODE 2-PIPE:

CODE	height	length	color	connection
BZMW	. 055	095	. XXX	/20

color code (fill in)

BRIZA EC HYBRID H52 / H55 Built-In general technical data

		L >	52/75	72/95	102/125	122/145
Power supply	V		24V			
Length (L)	cm		52/75	72/95	102/125	122/145
	inch		20.47"/29.52"	28.34"/37.40"	40.15"/49.21	48.03"/57.08"
Height	cm		52 / 55			
	inch		20.47"/21.65"			
Dept	cm		12			
	cm		4.72"			
Connection standard coil	inch		3/4" NPT			
Connection secondary coil	inch					
Connection for the condensate drain	inch		0.78"			
Water content standard coil	Liter		0.30	0.50	0.80	1.00
	US Gallon		0.079	0.132	0.210	0.264
Water content secondary coil	Liter		0.15	0.25	0.40	0.50
	US Gallon		0.039	0.066	0.105	0.132

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BRIZA EC 12 HYBRID with enclosure H 041: 2-pipe heating capacity

Heating capacity H41 2-pipe (BZMW/BZMC)

170/150/68°F

H41	10 V	8 V	6 V	4 V	2 V
L075	5826	4871	4187	3594	3154
L095	9591	7829	6266	5931	5390
L125	15233	12630	10763	9490	8478
L145	18994	15874	13593	11862	10463

130/110/68°F

H41	10 V	8 V	6 V	4 V	2 V
L075	3292	2752	2365	2030	1782
L095	5419	4423	3540	3351	3046
L125	8606	7136	6081	5362	4790
L145	10731	8969	7680	6702	5912

95/85/68°F

H41	10 V	8 V	6 V	4 V	2 V
L075	1396	1167	1003	861	756
L095	2298	1876	1501	1421	1292
L125	3650	3026	2579	2274	2031
L145	4551	3804	3257	2842	2507

- Supply water/Return water/Room air (°F)

Water flow at maximaal fan speed 10V

H38	170/150/68 (GPM)	45/55/80 (GPM)
L075	0.58	0.32
L095	0.96	0.52
L125	1.53	0.83
L145	1.91	1.03

Heating capacity H55 2-pipe (BZMW/BZMC)

170/150/68°F

H55	10 V	8 V	6 V	4 V	2 V
L075	9029	8011	6978	5931	4884
L095	14950	13310	11548	9699	7850
L125	23829	21282	18407	15431	12420
L145	29750	26551	23009	19259	15735

130/110/68°F

H55	10 V	8 V	6 V	4 V	2 V
L075	5101	4526	3942	3351	2760
L095	8447	7520	6525	5480	4435
L125	13463	12024	10400	8719	7017
L145	16808	15001	13000	10881	8890

95/85/68°F

H55	10 V	8 V	6 V	4 V	2 V
L075	2164	1919	1672	1421	1170
L095	3582	3189	2767	2324	1881
L125	5710	5100	4411	3698	2976
L145	7129	6362	5513	4615	3770

- Supply water/Return water/Room air (°F)

Water flow at maximaal fan speed 10V

H38	170/150/68 (GPM)	45/55/80 (GPM)
L075	0.91	0.49
L095	1.50	0.82
L125	2.39	1.30
L145	2.99	1.62

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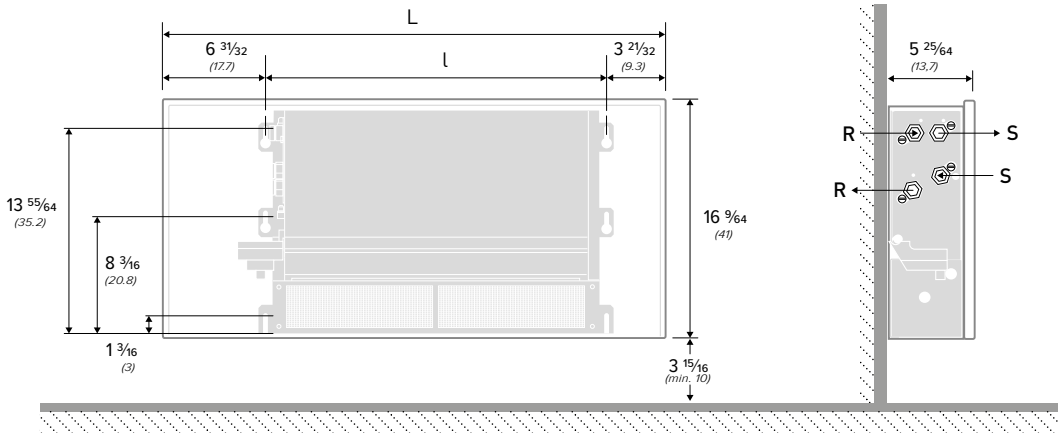
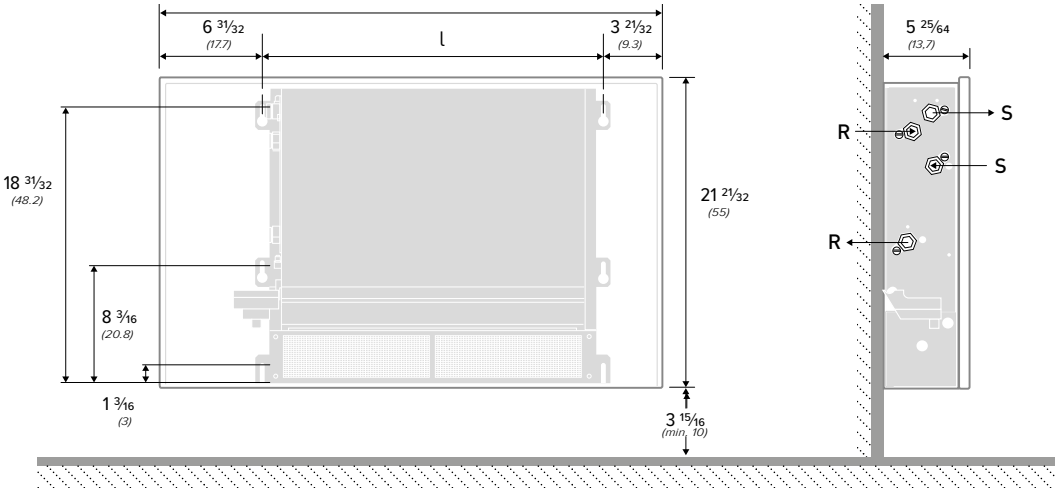
BRIZA EC 12 HYBRID with enclosure dimensions

Wall / Ceiling: dimensions

Briza 041



Briza 055



	L >	75	95	125	145
L	cm (inch)	75 (29 17/32)	95 (37 13/32)	125 (49 7/32)	145 (57 3/32)
l		48 (18 57/64)	68 (26 49/64)	98 (38 37/64)	118 (46 29/64)

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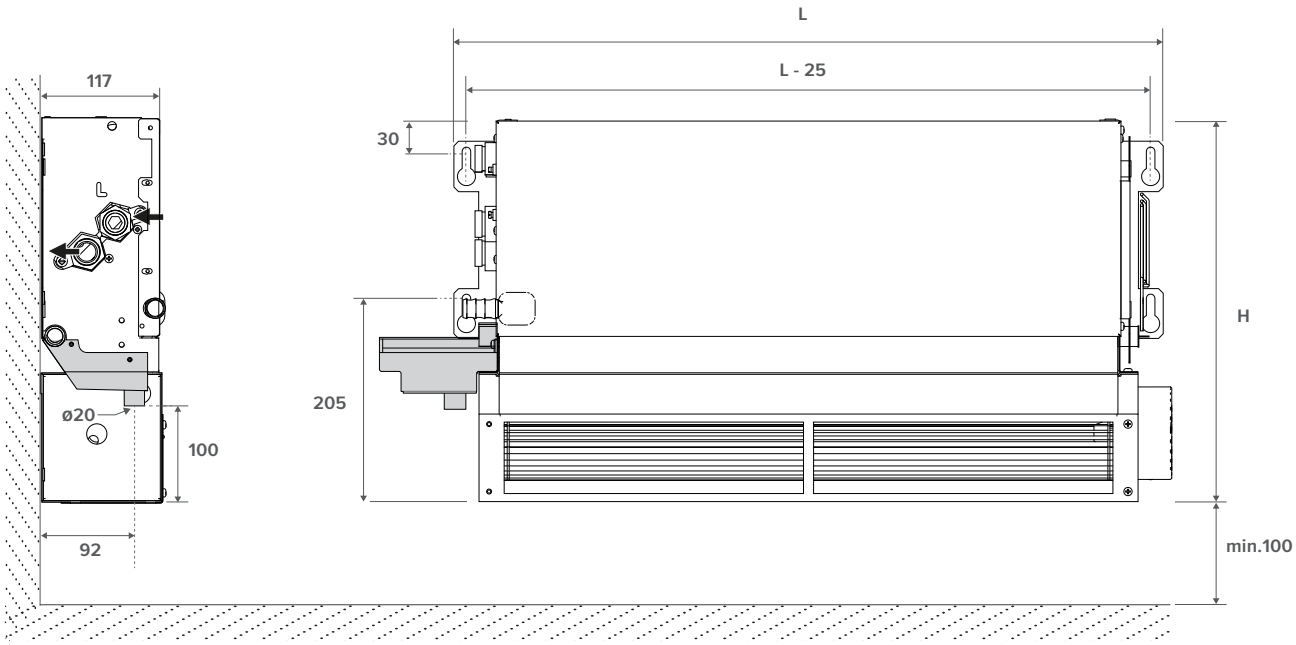
BRIZA 12 INSTALLATION IN A WALL RECESS

DIMENSIONS *(in mm)*



STANDARD DELIVERY

- condensation tray with drain
- aluminium-copper heat exchanger with hydrophilic coating
- sturdy casing manufactured from electro-galvanised steel
- thermal Activator(s) (tangential mini activator)
- stainless steel air filter

CONNECTION

Standard

- 1/2"G hydronic connections on the left
- clamp connector for electric connection 24 VDC, to connect via an external power supply, on the right hand side.

Optional

Hydronic right, electric left:
Connection code **R** instead of **L**. No surcharge.

ORDER CODE BRIZA 12 INSTALLATION IN A WALL RECESS

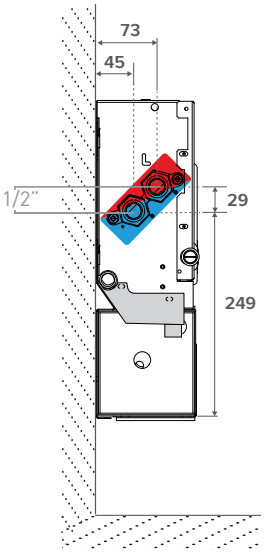
BZBW 038 052 12 2 L DDD

- *Control:*
  - *No control system: (leave blank)*
  - *Jaga BMS 0-10V control: D03*
  - *Jaga 3 settings controller: D05*
- *Length*
- *Height*

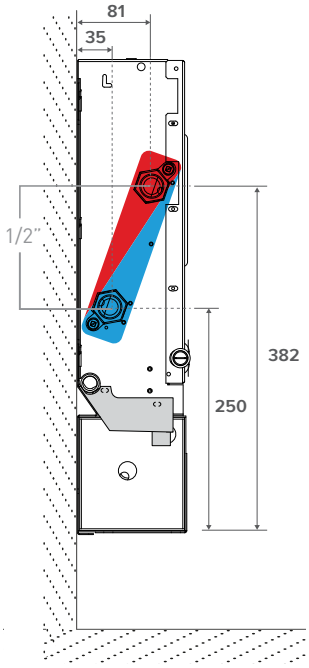
BRIZA 12 INSTALLATION IN A WALL RECESS

DIMENSIONS *(in mm)*

Height 38



Height 52



CONNECTION POSSIBILITIES

Eurocone connection set with thermoelectric motor

set **295** **KVS 0.8**

CODY SC5 24 4...	24 VDC
CODY SC5 10 4...	0..10 VDC

fill in sleeve coupling code

Connection set with 2 lockshield valves

set **290**

CODY LOC 00 4...

fill in sleeve coupling code

Sleeve couplings 3/4" Eurocone

PRECISION METAL TUBE		SYNTHETIC OR RPE/ALU	
CODE	*Tube Ø*	CODE	*Tube Ø*
112	12/1	612	12/2
114	14/1	614	14/2
115	15/1	616	16/2
116	16/1	618	18/2
118	18/1	619	16/1.5
		620	20/2

Stainless steel flexible connections 1/2"

CODE	Length	
7990 068	200 < 260 mm	2 units

POWER SUPPLIES

⚠ ***Jaga units are only CE: EN-60335 certified with use of the original Jaga power supplies***

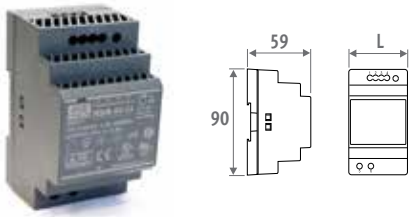
Waterproof power supply 24 VDC with waterproof cable gland

- with waterproof swivel nut connector
- in compliance with UL1310 - EN 60950-1 / Class II
- output voltage 24 VDC
- input voltage 100 - 240 VAC
- output current 1.67 A
- output 40 Watts
- dimensions L 14.5 x B 4.5 x H 3.0 cm

CODE	
37603 010002	
P *(add* **"P"** *to the order code)*	pre-mountend

Ex.: BZBW 038 052 12 2 L D03 ***P***

Power supply DIN-rail assembly



- for DIN-rail or wall mounting in a electrical switchboard
- in compliance with UL60950 / UL508 / EN 60950-1 / TUV EN61558-2-16 / Class II
- output voltage 24 VDC
- input voltage 100 - 240 VAC
- screw connection
- LED indicator

CODE	L *mm*	OUTPUT *Watts*	OUTPUT CURRENT *A*
7990 054	3.5	36	1.50
7990 055	5.3	60	2.50
7990 056	7.0	92	3.90
7990 057	10.3	150	6.25

JAGA CONTROLS (OPTIONAL)

JDPC (JAGA DYNAMIC PRODUCT CONTROLLER)

Control panel

CODE	POSITION	CONTROL PANEL	EXTERNAL 0-10 V CONTROL	WATER TEMPERATURE SENSOR	AIR TEMPERATURE SENSOR
Jaga BMS 0-10V control (D03)		-	✓	✓	-
Jaga 3 settings controller (D05)		✓	-	✓	-

NO JAGA CONTROL SYSTEM

- Upon request for cold or heat, a BMS/home automation system or a JAGA termostat will open the thermoelectric valve.
- Upon request for cold or heat, a BMS/home automation system or a JAGA termostat will send a 0-10 VDC signal. The fan will rotate proportionally to the 0-10 VDC signal.

JAGA BMS 0-10V CONTROL

- Upon request for cold or heat, a BMS/home automation system or a JAGA termostat will open the thermoelectric valve.
- When heat or cold is requested, a BMS/home automation system or JAGA thermostat will transmit a 0-10V signal.
- When the fan recognises cold (<18°C) or hot (>28°C) water, it will rotate proportionally of the 0-10V signal

JAGA 3 SETTINGS CONTROLLER

- When heat or cold is requested, an external signal (thermostat, BMS/home automation, ...) a thermal engine.
- Heating: The fan will rotate at a fixed speed once the water has reached the setting of 28°C.
- Cooling: he fan will rotate at a fixed speed once the water has reached the setting of 18°C.
- The user manually selects the desired mode via the control panel / / / OFF. The unit can run at 3 speeds. The unit starts at the last selected speed(1, 2 or 3) when the preset water temperature is reached.

BRIZA 12 INSTALLATION IN A WALL RECESS

HEIGHT 038

	HEIGHT	LENGTH	TYPE	CONTROL VOLTAGE	COOLING (non-condensing) Room temperature 27°C	COOLING TOTAL Room temperature 27°C	PERCEPTIBLE COOLING Room temperature 27°C	HEATING Room temperature 20°C				SOUND PRESSURE LEVEL	AIR FLOW	POWER CONSUMPTION	WEIGHT	WATER CONTENT	ORDER CODE
	H	L	T	U	16/18	7/12	7/12	35/30	45/40	50/45	55/45						
	cm	cm	cm	V	Watts	Watts	Watts	Watts	Watts	Watts	Watts	dB(A)	m^3/h	Watts	kg	L	
BZBW	**038**	**052**	**12**	**2**	113	279	197	247	450	550	596	19.0	70	1.6	7.0	0.166	BZBW 038 052 12 2 L DDD
				4	142	347	248	285	517	633	686	25.2	111	2.6			
				6	172	415	301	324	589	721	781	32.5	155	4.3			
				8	203	484	355	379	688	842	912	39.0	196	7.2			
				10	235	553	410	454	826	1010	1095	44.0	235	13.0			
		072	**12**	**2**	198	488	345	401	728	891	966	21.5	119	2.5	9.0	0.270	BZBW 038 072 12 2 L DDD
				4	234	570	408	490	891	1090	1182	27.5	189	4.3			
				6	277	668	484	519	944	1155	1252	34.9	245	7.2			
				8	329	782	573	609	1106	1354	1467	40.7	315	11.5			
				10	387	911	676	748	1358	1662	1802	45.0	380	18.0			
		102	**12**	**2**	326	804	569	644	1171	1433	1553	23.1	160	2.6	13.0	0.433	BZBW 038 102 12 2 L DDD
				4	369	899	644	790	1435	1756	1903	30.0	243	4.8			
				6	432	1039	753	844	1533	1876	2033	38.0	328	8.0			
				8	513	1221	895	989	1797	2199	2383	44.0	419	14.0			
				10	615	1445	1072	1188	2158	2641	2862	48.5	492	24.0			
		122	**12**	**2**	392	967	684	810	1472	1801	1952	26.0	190	2.8	14.0	0.539	BZBW 038 122 12 2 L DDD
				4	423	1029	737	996	1809	2214	2399	31.4	295	5.5			
				6	526	1267	918	1063	1932	2365	2563	38.4	410	10.3			
				8	656	1560	1143	1242	2258	2763	2995	44.2	512	18.5			
				10	763	1795	1331	1480	2690	3292	3568	48.0	560	28.8			

Enter control system code
No control system: (leave blank)
Jaga BMS 0-10V control: D03
Jaga 3 settings controller: D05

BRIZA 12 INSTALLATION IN A WALL RECESS

HEIGHT 052

	HEIGHT	LENGTH	TYPE	CONTROL VOLTAGE	COOLING (non-condensing) Room temperature 27°C	COOLING TOTAL Room temperature 27°C	PERCEPTIBLE COOLING Room temperature 27°C	HEATING Room temperature 20°C				SOUND PRESSURE LEVEL	AIR FLOW	POWER CONSUMPTION	WEIGHT	WATER CONTENT	ORDER CODE
	H	L	T	U	16/18	7/12	7/12	35/30	45/40	50/45	55/45						
	cm	cm	cm	V	Watts	Watts	Watts	Watts	Watts	Watts	Watts	dB(A)	m^3/h	Watts	kg	L	
BZBW	052	052	12	2	187	461	326	371	674	825	894	21.0	89	2.0	8.0	0.332	BZBW 052 052 12 2 L DDD
				4	222	541	387	433	787	963	1044	27.0	130	3.2			
				6	266	641	464	522	948	1161	1258	33.9	169	5.5			
				8	317	754	553	594	1079	1321	1432	39.7	212	9.6			
				10	349	820	608	672	1222	1495	1620	44.0	250	16.8			
		072	12	2	319	787	557	610	1108	1356	1470	21.8	127	2.2	10.0	0.540	BZBW 052 072 12 2 L DDD
				4	377	919	658	725	1318	1613	1748	27.2	193	3.6			
				6	444	1069	775	866	1573	1926	2087	34.6	262	5.7			
				8	513	1221	895	992	1803	2207	2392	40.8	320	9.6			
				10	577	1357	1006	1113	2023	2476	2683	45.0	365	15.6			
		102	12	2	508	1252	886	964	1751	2143	2323	24.0	168	2.8	14.0	0.866	BZBW 052 102 12 2 L DDD
				4	595	1450	1038	1151	2091	2560	2774	30.3	259	5.4			
				6	708	1703	1234	1373	2495	3054	3309	37.7	353	10.0			
				8	823	1959	1436	1581	2874	3517	3811	43.7	437	18.0			
				10	920	2163	1605	1775	3225	3947	4277	48.0	513	28.8			
		122	12	2	627	1545	1093	1151	2092	2560	2774	26.2	200	2.8	15.0	1.078	BZBW 052 122 12 2 L DDD
				4	746	1817	1300	1434	2605	3188	3455	32.0	297	5.5			
				6	890	2142	1552	1713	3113	3810	4130	39.0	396	10.0			
				8	1022	2431	1782	1978	3594	4399	4768	44.5	500	18.0			
				10	1149	2702	2004	2216	4026	4928	5340	48.5	583	28.8			

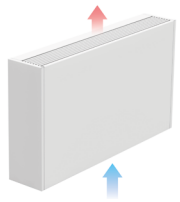
Enter control system code
No control system: (leave blank)
Jaga BMS 0-10V control: D03
Jaga 3 settings controller: D05

Briza 22 wall mounted with casing:

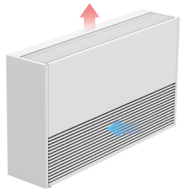
- 4 versions, each in 6 lengths
- 2-pipe system or 4-pipe system

Types:

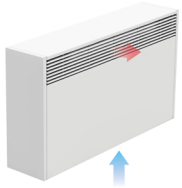
T2 / 55 , T3 / 75 , T4 / 95 , T6 / 125 , T8 / 155 , T10 / 190



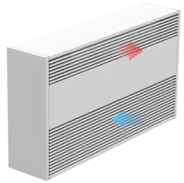
TYPE BAMW/BT



TYPE BAMW/FT



TYPE BAMW/BF



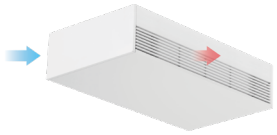
TYPE BAMW/FF

Briza 22 ceiling mounted with casing:

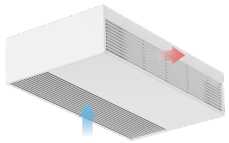
- 2 versions, each in 6 lengths
- 2-pipe system or 4-pipe system

Types:

T2 / 55 , T3 / 75 , T4 / 95 , T6 / 125 , T8 / 155 , T10 / 190



TYPE BAMC/BT



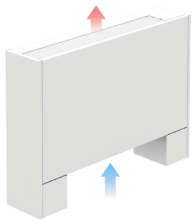
TYPE BAMC/FT

Briza 22 freestanding:

- 1 version, each in 6 lengths
- 2-pipe system or 4-pipe syste

Types:

T2 / 55 , T3 / 75 , T4 / 95 , T6 / 125 , T8 / 155 , T10 / 190



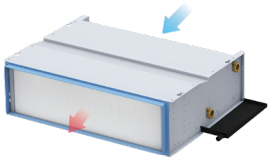
TYPE BAMF/BT

Briza 22 HP built-in ceiling High Performance:

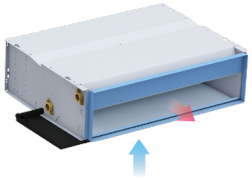
- High-performance centrifugal fan(s) with double inlet

Types:

T3 / 75 , T4 / 95 , T6 / 125 , T8 / 155, T10 / 190

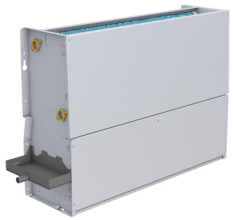


TYPE BPBC/BT



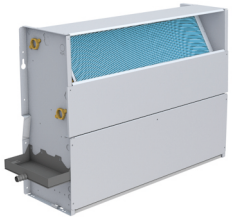
TYPE BPBC/FT

Nomenclature



TYPE: BABW/**BT**

TYPE: BABW/**FT**



TYPE: BABW/**BF**

TYPE: BABW/**FF**

Built-in

BAB-.055 XXX22/YY/ZZ

- = C for ceiling or W for wall
XXX = Length (cm)
YY = Configuration: BT/FT/BF/FF
ZZ = 20 for 2-pipe/40 for 4-pipe

Casing

BAM-.062XXX22/YY/ZZ

- = C for ceiling or W for wall
XXX = Length (cm)
YY = Configuration: BT/FT/BF/FF
ZZ = 20 for 2-pipe/40 for 4-pipe

Built-in optional high performance

BAB-*.055 XXX22/YY/ZZ

- = C for ceiling or W for wall
XXX = Length (cm)
YY = Configuration: BT/FT/BF/FF
ZZ = 20 for 2-pipe/40 for 4-pipe

Casing

BAM-.062XXX22/YY/ZZ(HP)

- = C for ceiling or W for wall
XXX = Length (cm)
YY = Configuration: BT/FT/BF/FF
ZZ = 20 for 2-pipe/40 for 4-pipe

**BPB for HP*

General technical data

MODEL		T2 / 55	T3 / 75	T4 / 95	T6 / 125	T8 / 155	T10 / 190
Electrical connection	V-PH -Hz	120-1-60	120-1-60	120-1-60	120-1-60	120-1-60	120-1-60
Length	cm	55	75	95	125	155	190
	inch	21 5/8"	29 1/2"	37 3/8"	49 3/16"	61"	74 7/8"
Height	cm	54.5	54.5	54.5	54.5	54.5	54.5
	inch	3 7/8"	3 7/8"	3 7/8"	3 7/8"	3 7/8"	3 7/8"
Depth	cm	22.2	22.2	22.2	22.2	22.2	22.2
	inch	8 3/4"	8 3/4"	8 3/4"	8 3/4"	8 3/4"	8 3/4"
Weight	kg	17	21.5	27	35.5	44	56
	LBS	37.5	47.4	59.5	78.3	97	123.5
Connection primary coil	inch	3/4" NPT (F)	3/4" NPT (F)	3/4" NPT (F)	3/4" NPT (F)	3/4" NPT (F)	3/4" NPT (F)
Connection secondary coil	inch	1/2" NPT (F)	1/2" NPT (F)	1/2" NPT (F)	1/2" NPT (F)	1/2" NPT (F)	1/2" NPT (F)
Connection condensate drain	mm	20	20	20	20	20	20
	inch	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
Coil type (primary)		4 rows	4 rows	4 rows	4 rows	4 rows	4 rows
Water capacity primary coil	L	1.23	1.77	2.23	3.14	4.05	4.46
	gallon	0.32	0.47	0.59	0.83	1.07	1.18
Water capacity secondary coil	L	0.31	0.42	0.53	0.69	0.85	1.06
	gallon	0.08	0.11	0.14	0.18	0.22	0.28
Number of fans		1	2	2	3	4	5

MODEL		T2 / 55	T3 / 75	T4 / 95	T6 / 125	T8 / 155	T10 / 190
		W	**W**	**W**	**W**	**W**	**W**
Electrical power (Pe)	2 VDC	3.7	3.6	4	9	6.3	11.1
	4 VDC	8	8.5	10	18	15	25.9
	6 VDC	17	18	20	34	35	52
	8 VDC	29	31	36	59	64	93
	10 VDC	42	45	50	79	86	131
		A	**A**	**A**	**A**	**A**	**A**
Current (I)	2 VDC	0.36	0.41	0.44	0.64	0.73	1
	4 VDC	0.26	0.29	0.33	0.48	0.55	0.77
	6 VDC	0.16	0.17	0.19	0.31	0.31	0.47
	8 VDC	0.09	0.09	0.1	0.19	0.15	0.26
	10 VDC	0.06	0.05	0.05	0.12	0.08	0.15
	inH_2O	**CFM**	**CFM**	**CFM**	**CFM**	**CFM**	**CFM**
Air flow (CFM) in function of static pressure (inH_2O) @10 V speed	0	285.46	350.2	449.67	649.79	745.14	1131.25
	0.04	264.86	323.72	406.12	591.52	679.81	1047.67
	0.08	250.15	306.06	376.69	559.15	632.72	959.38
	0.121	235.43	282.52	347.26	523.83	585.63	869.92
	0.161	223.66	264.86	323.72	488.52	538.55	781.04
	0.201	206	241.32	291.35	453.2	488.52	693.93
	0.241	194.23	220.72	258.97	414.95	444.38	606.82
	0.281	176.57	197.17	226.6	373.75	397.29	519.13
	0.321	155.97	170.69	197.17	326.66	344.32	427.9
	0.362	141.26	141.26	161.86	279.57	282.52	329.01
	0.402	117.72	114.77	129.49	223.66	220.72	217.19
	0.442	100.06	82.4	88.29	179.52	161.86	86.52
	0.482	82.4	50.03	52.97	129.49	94.17	-
	inH_2O	**W/CFM**	**W/CFM**	**W/CFM**	**W/CFM**	**W/CFM**	**W/CFM**
Specific power @10 V speed with MERV 4	0	0.667	0.576	0.498	0.545	0.517	0.519
	0.12	0.593	0.568	0.509	0.572	0.511	0.678

Briza 22 primary coil

High-quality coil for heating and cooling

The coil consists of 4 rows of round seamless tubes made of pure red copper, connected to aluminum fins with a hydrophilic coating. It includes an integrated hydraulic header, including an air vent. Connection ¾" NPT left, also available with righthand side connection.

- Heating and cooling coil in 2-pipe configuration
- Cooling coil in 4-pipe configuration

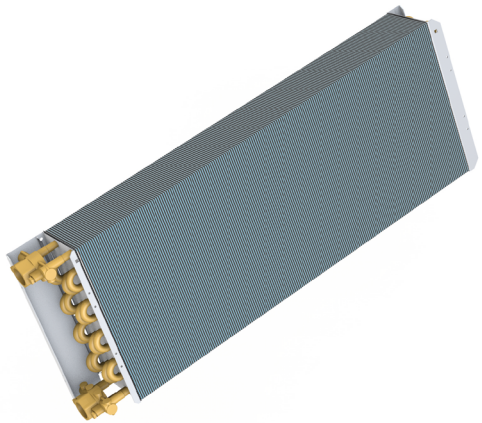
2-pipe system:

- A 2-pipe fan coil system consists fan coil units with a single coil connected to two pipes (one supply pipe and one return pipe). A building with a 2-pipe system is either entirely in heating mode or entirely in cooling mode.

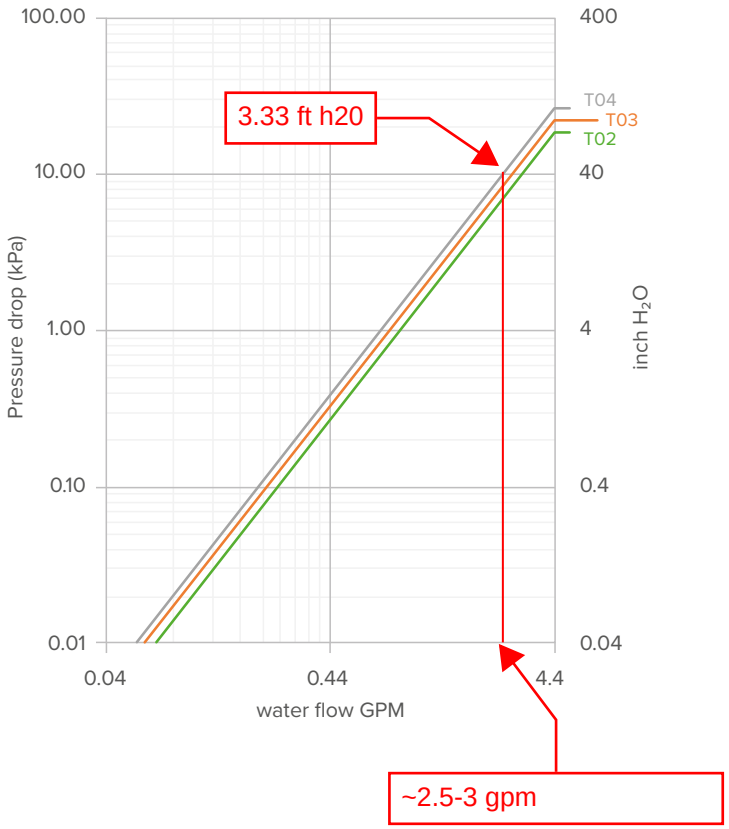
4-pipe system:

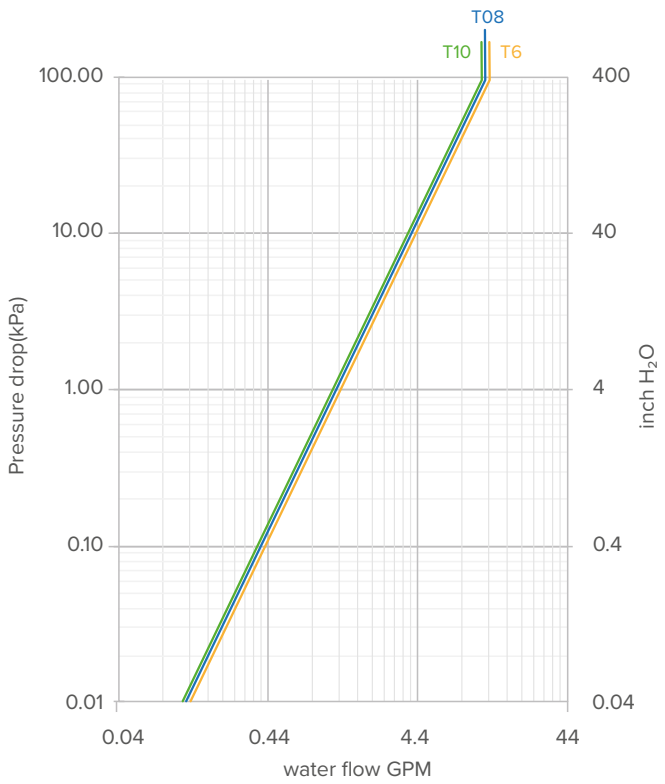
- A 4-pipe system consists of fan coil units with a separate heating and cooling coil, as well as separate pairs of heating and cooling pipes. Hot water and chilled water is always available.

The system is able to instantly switch from heating to cooling mode, or vice versa, and can provide heating to some rooms while simultaneously cooling other rooms.



Pressure drop curve standard coil

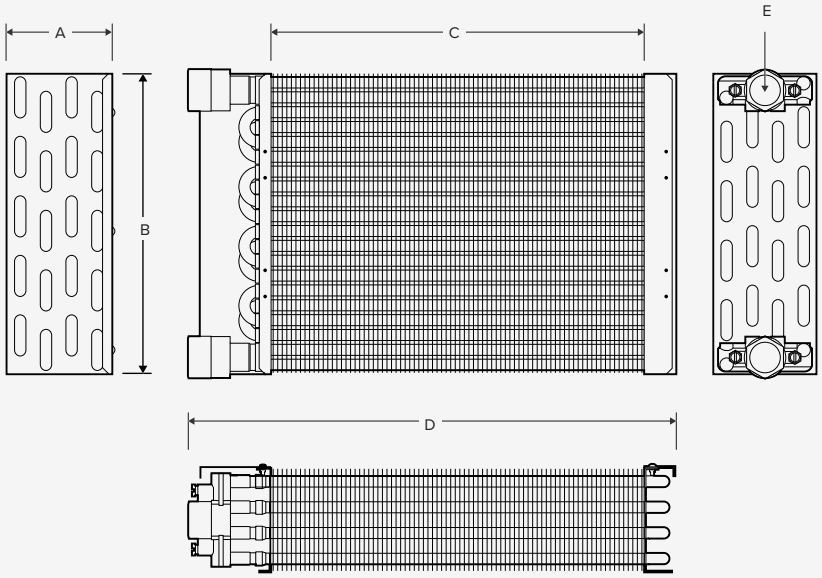




DIMENSIONS

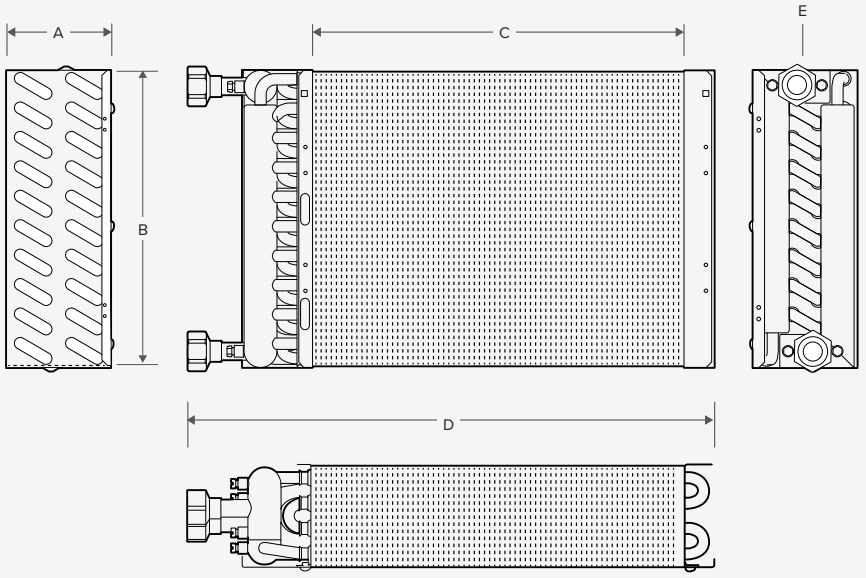
Dimensions T2 / T3 / T4

- In a 2-pipe system for heating and cooling
- In a 4-pipe system for cooling



	A	B	C	D	E
L (inches)	3 ½"	9 ⅝"	L - 5 ½"	L - 1 ¾"	¾"
L (cm)	8.66	25	L - 13.8	L-4.4	¾"

Dimensions T6 / T8 / T10



	A	B	C	D	E
L (inches)	3 ½"	9 ⅝"	L - 5 ½"	L	¾"
L (cm)	8.66	25	L - 13.8	L	¾"

Technical data

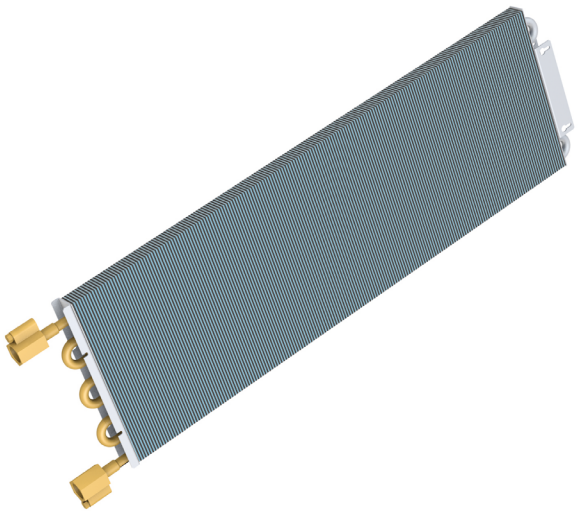
MODEL			T2 / 55	T3 / 75	T4 / 95	T6 / 125	T8 / 155	T10 / 190
Coil	(± 5 mm) Length	mm	506.5	706.5	906.5	1250	1550	1900
		inch	19 ½"	27 ½"	35 ⅜"	49 ⅛"	61"	74 ¾"
	(± 3 mm) Finned Length	mm	412	612	812	1112	1412	1762
		inch	16 ¼"	24 ⅛"	32"	43 ¾"	55 ½"	69 ⅜"
	Header material		brass	brass	brass	brass	brass	brass
	Air vent	Qty	1	1	1	1	1	1
	Water content	litre	1.2	1.8	2.2	3.1	4.1	5.0
		gallon	0.3	0.5	0.6	0.8	1.1	1.3
	Test pressure	bar	26	26	26	26	26	26
		PSI	377	377	377	377	377	377
	Working pressure	bar	20	20	20	20	20	20
		PSI	290	290	290	290	290	290
	Connection	inch	NPT ¾"	NPT ¾"	NPT ¾"	NPT ¾"	NPT ¾"	NPT ¾"
	Coating		hydrophilic coating	hydrophilic coating	hydrophilic coating	hydrophilic coating	hydrophilic coating	hydrophilic coating
	Material circulation tubes		copper	copper	copper	copper	copper	copper
Fins	Size hxw	mm	250 x 86.6 mm	250 x 86.6 mm	250 x 86.6 mm	250 x 86.6 mm	250 x 86.6 mm	250 x 86.6 mm
		inch	9 ⅞" x 3 ½"	9 ⅞" x 3 ½"	9 ⅞" x 3 ½"	9 ⅞" x 3 ½"	9 ⅞" x 3 ½"	9 ⅞" x 3 ½"
	Size	cm^2	216.5	216.5	216.5	216.5	216.5	216.5
		$inch^2$	33.6	33.6	33.6	33.6	33.6	33.6
	Spacing	mm	2.1	2.1	2.1	2.1	2.1	2.1
		inch	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"
	Material		aluminium	aluminium	aluminium	aluminium	aluminium	aluminium

In a two-pipe system for heating and cooling
In a 4-pipe system for cooling

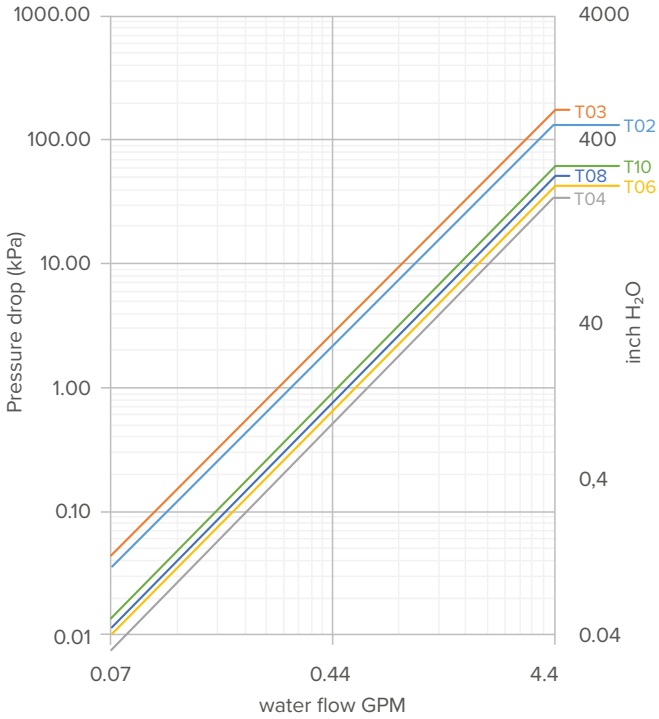
Briza 22 secondary coil

High-quality coil for heating in a 4-pipe system. The coil consists of one row of round seamless pipes made of pure red copper, connected to aluminum fins with a hydrophilic coating. It includes an integrated hydraulic header, including air vent. Connection ½" NPT left, also available with right hand side connection.

- Heating coil in 4-pipe configuration



Pressure drop curve for secondary coil



Technical data

MODEL			T2 / 55	T3 / 75	T4 / 95	T6 / 125	T8 / 155	T10 / 190
Coil	(± 5 mm) Length	mm	545	745	845	1245	1545	1945
		inch	21 7/16"	29 5/16"	33 1/4"	49"	60 13/16"	76 9/16"
	(± 3 mm) Finned Length	mm	512	712	812	1112	1412	1812
		inch	20 3/16"	28 1/16"	31 15/16"	43 3/4"	55 9/16"	71 5/16"
	Material collector		brass	brass	brass	brass	brass	brass
	Air vent	number	1	1	1	1	1	1
	Water content	litre	0.31	0.42	0.53	0.69	0.85	1.01
	Pressure test element	bar	26	26	26	26	26	26
	Workload max.	bar	20	20	20	20	20	20
	Connection	inch	½" NPT	½" NPT	½" NPT	½" NPT	½" NPT	½" NPT
	Coating		hydrophilic coating	hydrophilic coating	hydrophilic coating	hydrophilic coating	hydrophilic coating	hydrophilic coating
	Type coil		1 row	1 row	1 row	1 row	1 row	1 row
	Material circulation tubes		copper	copper	copper	copper	copper	copper
Fins	Size hxw	mm	203 x 21.65	203 x 21.65	203 x 21.65	203 x 21.65	203 x 21.65	203 x 21.65
	Size	cm^2	439.5	439.5	439.5	439.5	439.5	439.5
	Spacing	mm	2.1	2.1	2.1	2.1	2.1	2.1
	Material		aluminium	aluminium	aluminium	aluminium	aluminium	aluminium

In a 4-pipe system for heating only

Centrifugal fan

Nominal data:

- Phase: 1~
- Nominal voltage: 115 VAC (200-240VAC)*
- Frequency: 60 Hz
- Type of data definition: ml
- Speed: RPM 910 (1120)*
- Max. power: input 60 W (170 W)*
- Current draw: 0.5 A (0.8 A)*
- Min. static pressure: 0 Pa
- Min. ambient temperature: -13 °F
- Max. ambient temperature: 122 °F

*For Briza 22 HP

GREEN-TECH fan(s):

- Surface of rotor: galvanised
- Material of electronics housing: black PP plastic
- Material of impeller: PA plastic
- Housing material: black PP plastic
- Motor suspension: anti-vibration suspension, mounted on both sides
- Direction of rotation: clockwise, seen on rotor
- Type of protection: motor IP 44, electronic IP 20
- Insulation class: F
- Max. permissible ambient motor temp. (transp./storage) + 26 °F
- Min. permissible ambient motor temp. (transp./storage) - 40 °F
- Motor bearing: ball bearing

Technical features:

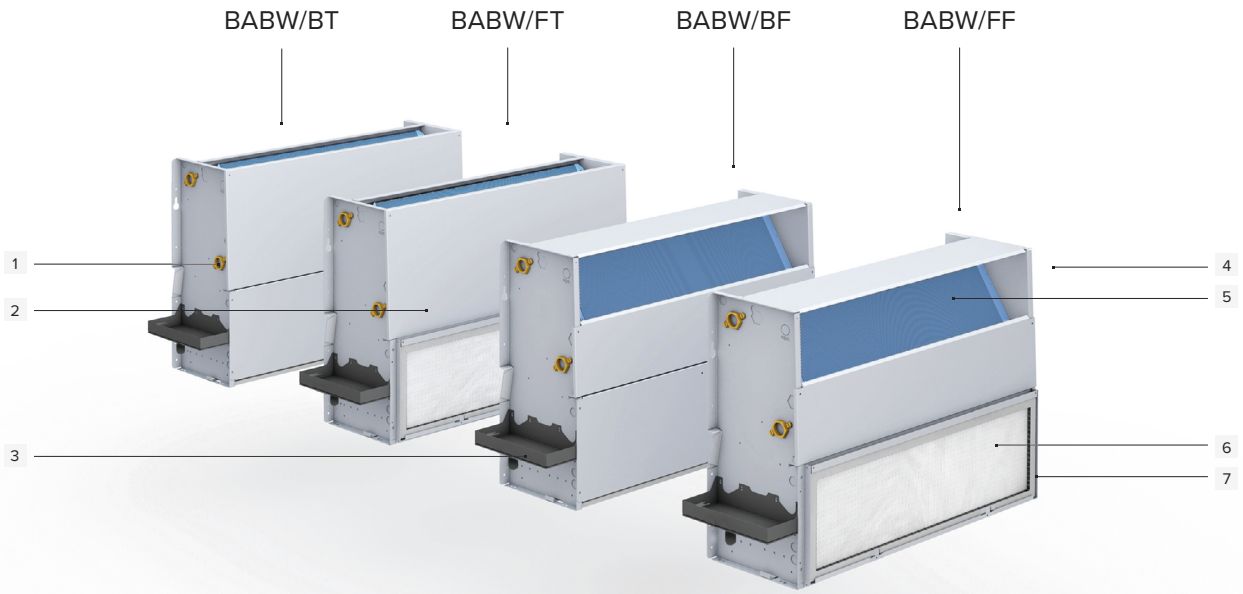
Output 10 VDC, max. 1.1 mA

- Tach output
- Motor current limit
- Soft start
- Control input 0-10 VDC/PWM
- Over-temperature protected motor

Safety

EMC interference immunity: acc. to EN 61000-6-2 (industrial environment)
EMC harmonics: acc. to EN 61000-3-2/3
EMC interference emission: acc. to EN 61000-6-3 (household environment)
Touch current: acc. IEC 60990 (measuring network Fig. 4, TN system)
<= 3.5 mA
Motor protection: thermal overload protector (TOP) wired internally
Protection: class I (if protective earth is connected by customer)
Product conforming to standard: EN 60335-1
Approval: CCC

Built-in wall configuration

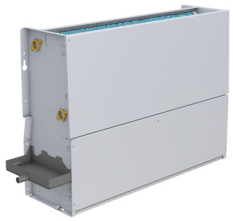


1. Hydraulic connection: ¾" NPT standard left
2. Internal frame in reinforced galvanized steel
3. Condensate drain, connection ¾"
4. Electrical connection, standard right*
5. Aluminum-copper coil with hydrophilic coating
6. Replaceable 1, 2 or 4" MERV 8 or 13 filter
7. Centrifugal fan(s) with double inlet

*Same side electrical and hydronic connections available for ceiling mounted units upon request

BABW.055XXX22/YY/ZZ ▪ XXX Length in centimeters ▪ YY Configuration BT/FT/BF/FF ▪ ZZ = 20 for 2-pipe/40 for 4-pipe

Built-in wall configuration



TYPE: BABW/BT

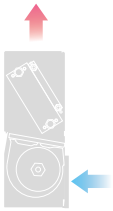
Built-In Wall standard

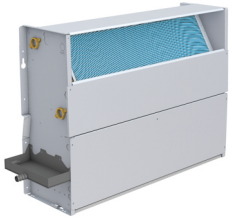
- Supply air at the top
- Return air at the bottom

TYPE: BABW/FT

Built-In Wall (optional)

- Supply air at the top
- Return air at the front
- Increased width for filter ¾"





TYPE: BABW/BF

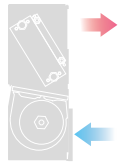
Built-In Wall (optional)

- Supply air at the front
- Return air at the bottom
- Increased width for filter ¾"

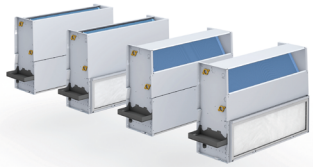
TYPE: BABW/FF

Built-In Wall (optional)

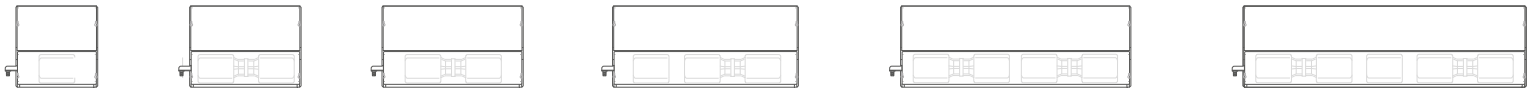
- Supply air at the front
- Return air at the front
- Increased width for filter ¾"



Dimensions

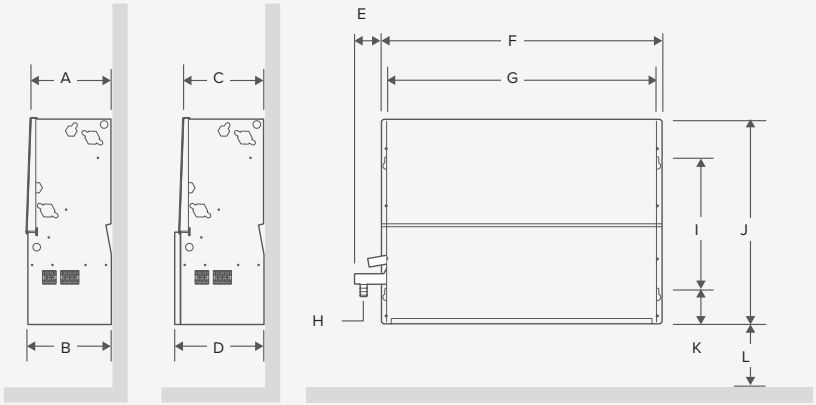


MODEL	T2 / 55	T3 / 75	T4 / 95	T6 / 125	T8 / 155	T10 / 190
Code	BABW	BABW	BABW	BABW	BABW	BABW
L (inches)	21 5/8"	29 1/2"	37 3/8"	49 1/8"	61"	72 7/8"
L (cm)	55	75	95	125	155	190

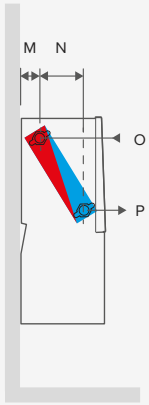


DIMENSIONS

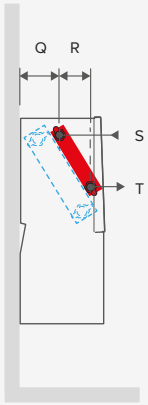
BF / BT FF / FT



Primary coil



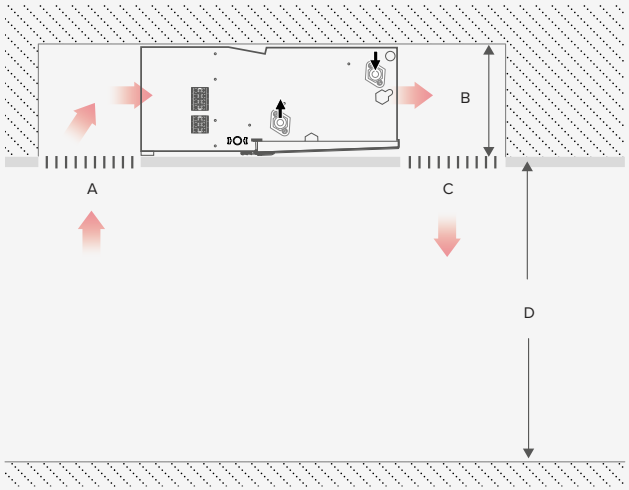
Secondairy coil



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
L (inches)	8 3/8"	8 3/4"	8 3/8"	9 1/2"	2 7/8"	L	L-1"	7/8"	13.75"	21 1/2"	3 1/2"	4"	2	4 1/2"	3/4" NPT	3/4" NPT	4 1/8"	3 1/2"	1/2" NPT	1/2" NPT
L (cm)	21.2	22.2	21.2	24.2	7.1	L	L-2.5	2	35	54.5	9	10	5	11	3/4" NPT	3/4" NPT	10.5	9	1/2" NPT	1/2" NPT

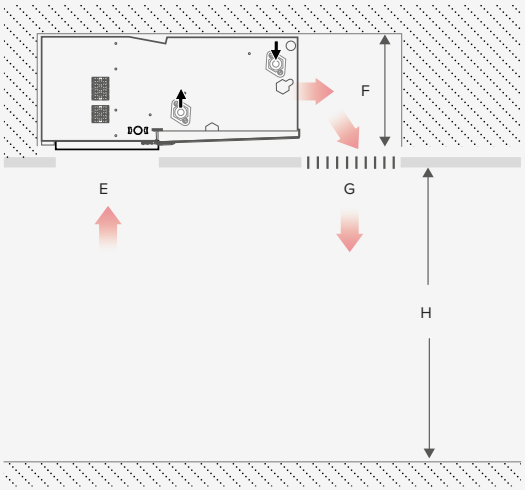
DIMENSIONS FOR INSTALLATION INTO CEILING

BT



	A	B	C	D*
L (inches)	6"< >10"	≥9½"	6" < > 10"	max. 10 ft
L (cm)	15< >25	≥24	15 < > 25	max. 300 cm

FT



	E	F	G	H*
L (inches)	10"	≥10½"	6" < > 10"	max. 10 ft
L (cm)	25	≥26	15 < > 25	max. 300 cm

*For heating application vertical air throw depends on water temperatures, fan speed and room geometry.

2-pipe performance

JAGA SELECTION MODEL

Speed level	Control voltage	Heating power*		Cooling power 50% RH*		Electrical power	Air flow
		170 / 150 / 68°F	95 / 85 / 68°F	45 /55 / 80°F			
				Sensible	Total		
%	V	BTU/h	BTU/h	BTU/h	BTU/h	W	CFM
T2 / 55							
20	2	8213	1879	2330	3141	3.7	84
40	4	16149	3695	4731	6047	12.5	184
60	6	22431	5133	6593	8211	31.3	273
80	8	28745	6577	7915	9876	58.2	346
100	10	34866	7978	8773	10752	86.5	399
T3 / 75							
20	2	8067	1958	2635	3664	3.1	81
40	4	18112	4396	5627	7754	9.1	188
60	6	26443	6418	8160	10951	22.6	296
80	8	32322	7845	10004	13677	43.6	394
100	10	35497	8616	11040	14469	65.3	462
T4 / 95							
20	2	9951	2246	3144	4376	3.2	109
40	4	26810	6050	8229	11037	11	270
60	6	38233	8629	11619	15223	27.1	407
80	8	45594	10290	13753	18267	51.6	521
100	10	48750	11002	14644	18791	70.4	583

Sound data upon request.
** Values according EN 1397*

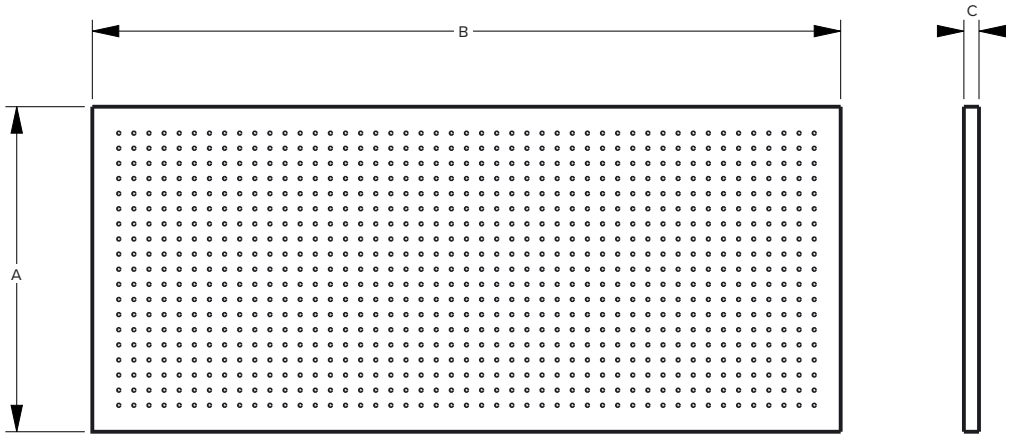
All capacity data at 0" external static pressure

Speed level	Control voltage	Heating power*		Cooling power 50% RH*		Electrical power	Air flow
		170 / 150 / 68°F	95 / 85 / 68°F	45 /55 / 80°F			
				Sensible	Total		
%	V	BTU/h	BTU/h	BTU/h	BTU/h	W	CFM
T6 / 125							
20	2	12242	2484	4265	5916	6.5	163
40	4	19039	3863	9013	12276	20.7	373
60	6	24139	4898	13321	17382	51	576
80	8	27366	5552	16798	22409	97.4	750
100	10	29041	5892	19192	22752	147	876
T8 / 155							
20	2	11338	2350	4712	6531	6.4	195
40	4	21289	4412	10803	14602	20	445
60	6	29288	6070	16481	21696	49.8	690
80	8	34778	7208	21123	28282	95.1	900
100	10	37630	7799	23985	30621	138.1	1034
T10 / 190							
20	2	17391	3587	7023	9780	9.8	237
40	4	30616	6315	15415	21272	30.9	540
60	6	41131	8484	23072	31482	75.2	843
80	8	48099	9921	29153	39946	140.4	1107
100	10	51576	10638	32860	44104	204	1281

Sound data upon request.
** Values according EN 1397*

All capacity data at 0" external static pressure

Air filtration



All types available in MERV 4, 8 or 13 media

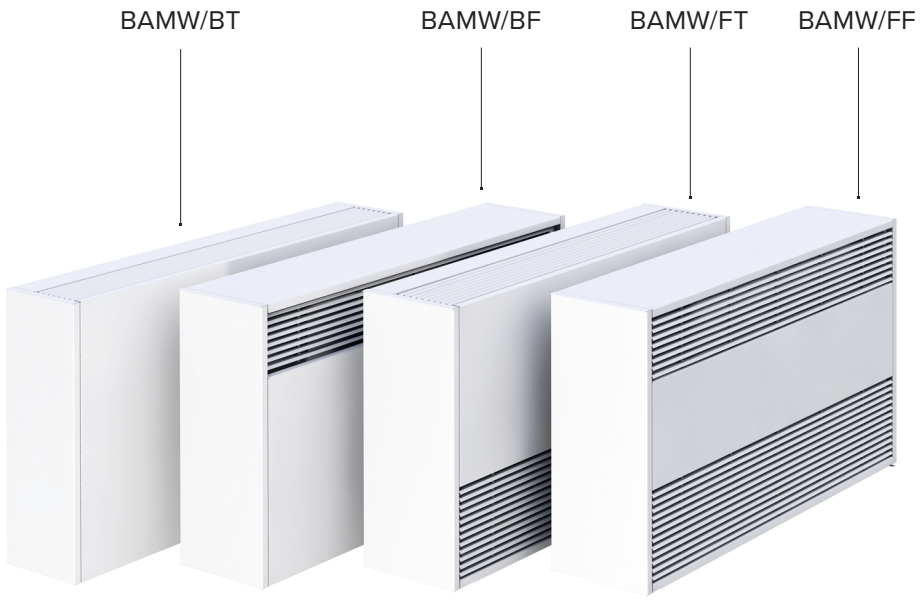
DIMENSIONS

MODEL	T2 / 55	T3 / 75	T4 / 95	T6 / 125	T8 / 155	T10 / 190
Code	8.721.401	8.721.402	8.721.403	8.721.404	8.721.405	8.721.406
L (inch)	19 ½"	27 ⅜"	35 ¼"	47 1⁄16"	58 ⅞"	2x 35 ¼"
L (mm)	495	695	895	1.195	1495	2x 895

	A*	B*	C**
L (inches)	8 7⁄16"	L	1"
L (mm)	215	L	25

* ±1⁄16" or 1,5 mm
** 1", 2" or 4" deep filters available

Wall mounted configuration



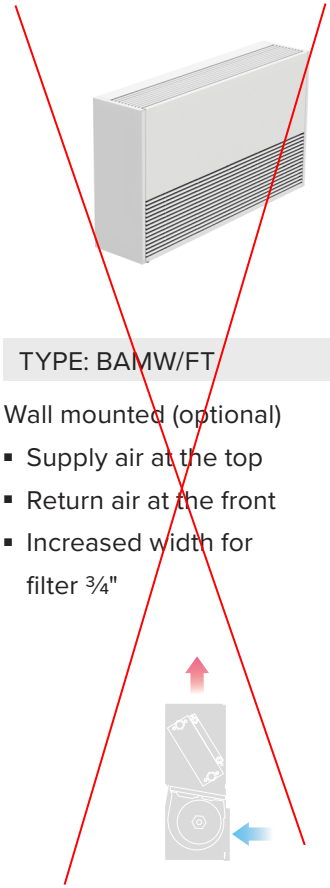
BAMW.062XXX22/YY/ZZ ▪ XXX Length in centimeters ▪ YY Configuration BT/FT/BF/FF ▪ ZZ = 20 for 2-pipe/40 for 4-pipe

Wall mounted configuration

TYPE: BAMW/BT

Wall mounted standard

- Supply air at the top
- Return air at the bottom



TYPE: BAMW/FT

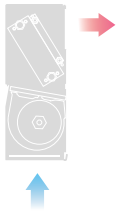
Wall mounted (optional)

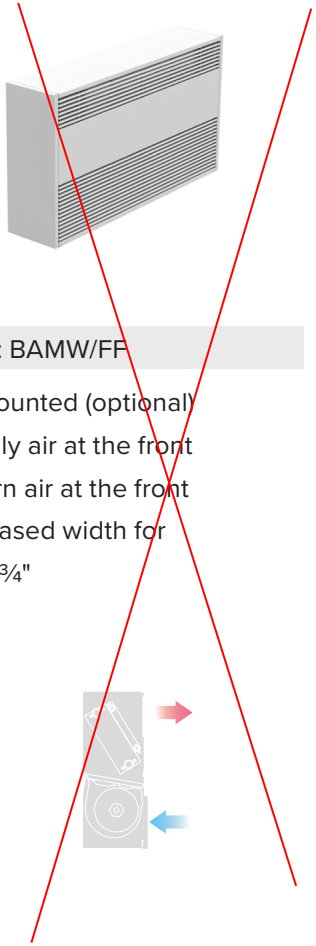
- Supply air at the top
- Return air at the front
- Increased width for filter ¾"

TYPE: BAMW/BF

Wall mounted (optional)

- Supply air at the front
- Return air at the bottom
- Increased width for filter ¾"





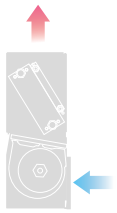
TYPE: BAMW/FF

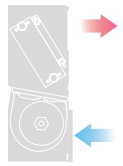
Wall mounted (optional)

- Supply air at the front
- Return air at the front
- Increased width for filter ¾"

Supply/return air configurations and options

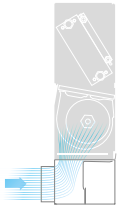
TYPE: BABW/BT	TYPE: BABW/FT	TYPE: BABW/BF	TYPE: BABW/FF
standard return air + standard supply air	CONFIGURATION front return air + standard supply air	standard return air + CONFIGURATION front supply air	CONFIGURATION front return air + CONFIGURATION front supply air



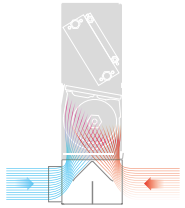


OPTION air mixing box. See page 77.

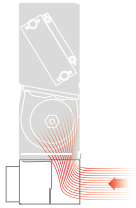
0..10 V Modulating motor



OPEN



MIX

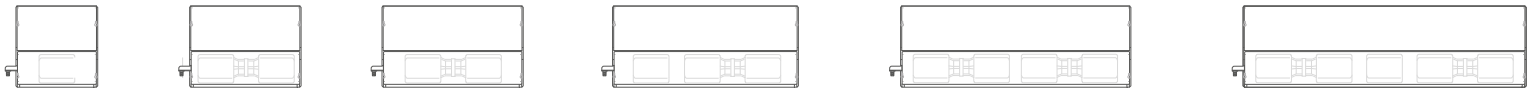


CLOSE

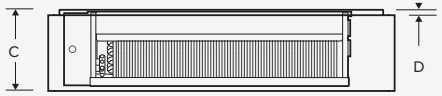
Dimensions

4'3" typical available window alcove width

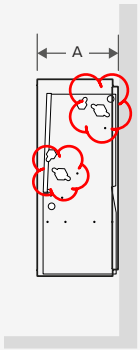
MODEL	T2 / 55	T3 / 75	T4 / 95	T6 / 125	T8 / 155	T10 / 190
Code	BABW	BABW	BABW	BABW	BABW	BABW
L (inches)	35 ½"	43 ¼"	51 ⅛"	63"	74 ⅞"	88 ⁹⁄₁₆"
L (cm)	90	110	130	160	190	225



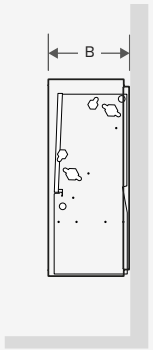
DIMENSIONS

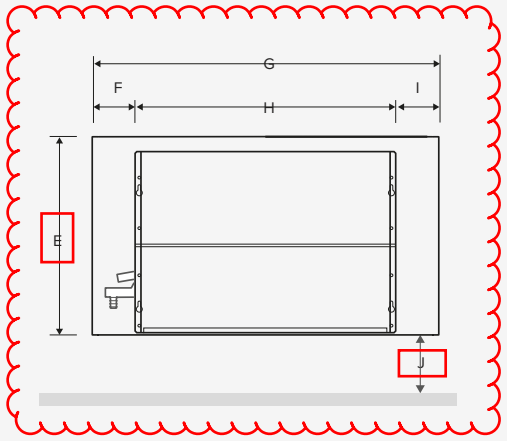


BT

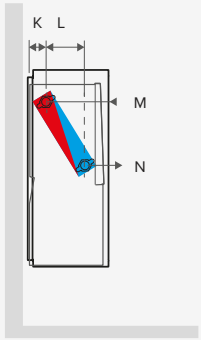


BF / FF / FT

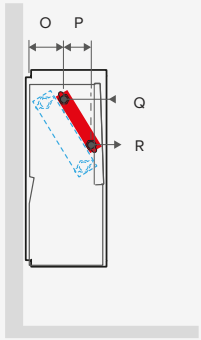




Primary coil



Secondairy coil



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
L (inches)	9 ⅛"	10 ⅝"	9 ⅛" */10 ⅝"	⅝"	24 ⅝"	6 ⅞"	L	L-13 ¾"	6 ⅞"	4"	2"	4 ¼"	¾" NPT	¾" NPT	4 ⅛"	3 ½"	½" NPT	½" NPT
L (cm)	23	27	23*/27	1.5	62.5	17.5	L	L-35	17.5	10	5	11	¾" NPT	¾" NPT	10.5	9	½" NPT	½" NPT

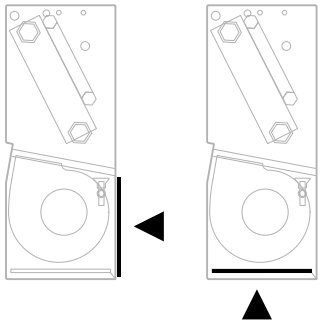
*BF only

Spare parts

ATTENTION!!

For replacement of defective parts, please contact the installer and consult the general Jaga Warranty Terms.

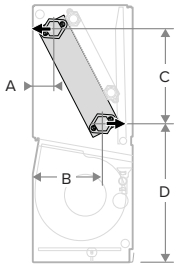
Filter

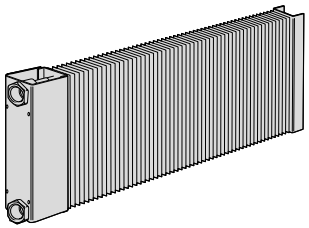


MODEL	T2 / 55	T3 / 75	T4 / 95	T6 / 125	T8 / 155	T10 / 190
Code	8721.401	8721.402	8721.403	8721.404	8721.405	8721.406

- ISO 16890: Coarse-40% - ePm10-50% / EN779-2012: G2-M5
- Fire-safe according to DIN 53438 (F1)

Standard primary coil: 2-pipe system heating - cooling, 4-pipe system cooling

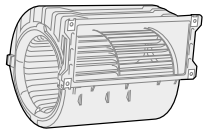


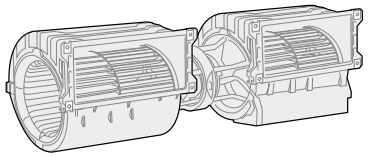


MODEL	T2 / 55	T3 / 75	T4 / 95	T6 / 125	T8 / 155	T10 / 190
Code	8776.0301	8776.0302	8776.0303	8776.0304	8776.0305	8776.0306

	A	B	C	D
L (inches)	1 13⁄16"	5 13⁄16"	7 7⁄8"	11 1⁄2"
L (cm)	4.6	14.8	20	29.3

Briza 22 Fan module



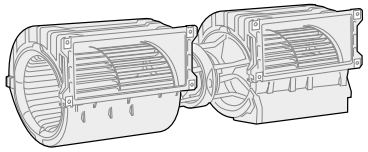


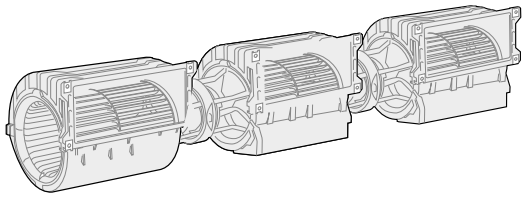
MODEL	T2 / 55	T3 / 75	T4 / 95	T6 / 125	T8 / 155	T10 / 190
24560.02200010	1x	-	-	1x	-	1x

MODEL	T2 / 55	T3 / 75	T4 / 95	T6 / 125	T8 / 155	T10 / 190
24560.02200011	-	1x	1x	1x	2x	2x

Expected lifespan of the fans:
With an operation of 24 hours a day and 7 days a week at 70% power at a temperature of 68°F, the expected lifetime is 84.482 hours, or about 10 years. After this there is a 1% chance of dropout.

ONLY BRIZA 22 HP: High Performance Fan module





MODEL	-	T3 / 75	T4 / 95	T6 / 125	T8 / 155	T10 / 190
24560.02200014	-	1x	1x	-	1x	1x

MODEL	-	T3 / 75	T4 / 95	T6 / 125	T8 / 155	T10 / 190
24560.02200015	-	-	-	1x	-	1x

Expected lifespan fans:
With an operation of 24 hours a day and 7 days a week at 70% power at a temperature of 68°F, the expected lifetime is 84.482 hours, or about 10 years. After this there is a 10% chance of dropout.

jaga CLIMATE DESIGNERS

Briza-22 02/03 (120V) - BABC.05505522, BABW.05505522, BABC.05507522, BABW.05507522										
	Sound Power Level, dB Ref. 1 pW								Sound Power	Sound Pressure
Fan Speed	Octave Band Frequency									
%	63	125	250	500	1000	2000	4000	8000	dBA	dBA
Inlet										
100	64	50	50	46	39	35	26	25	49	39
75	61	48	47	40	32	27	20	23	47	38
50	61	44	40	32	23	18	18	23	42	32
Discharge										
100	68	46	51	47	40	33	25	25	50	40
75	66	42	44	42	33	25	19	23	47	37
50	65	37	39	35	23	16	19	23	43	33
Casing Radiated										
100	49	43	41	34	29	25	22	26	41	31
75	48	41	36	29	22	16	19	26	38	28
50	46	32	33	23	15	13	19	25	34	24

Briza-22 04 (120V) - BABC.05509522, BABW.05509522										
	Sound Power Level, dB Ref. 1 pW								Sound Power	Sound Pressure
Fan Speed	Octave Band Frequency									
%	63	125	250	500	1000	2000	4000	8000	dBA	dBA
Inlet										
100	63	40	52	46	37	31	24	24	50	40
75	55	45	45	40	30	25	19	23	48	38
50	54	40	40	34	23	17	18	22	41	31
Discharge										
100	64	47	52	45	40	32	24	19	50	40
75	64	41	44	38	32	23	17	19	47	37
50	63	36	37	31	23	16	17	18	41	31
Casing Radiated										
100	55	42	39	34	29	29	27	27	39	29
75	53	37	36	30	23	21	22	27	38	28
50	52	33	33	23	15	14	23	26	34	24

Briza-22/26 06 (120V) - BABC.05512522, BABW.05512522, BBBC.05612526, BBBW.05612526										
	Sound Power Level, dB Ref. 1 pW								Sound Power	Sound Pressure
Fan Speed	Octave Band Frequency									
%	63	125	250	500	1000	2000	4000	8000	dBA	dBA
Inlet										
100	59	53	61	57	50	43	36	24	55	45
75	59	50	55	52	43	36	23	21	52	42
50	58	43	50	44	36	26	21	21	47	37
Discharge										
100	64	55	60	57	52	46	36	24	55	45
75	63	48	53	50	44	36	28	24	53	43
50	63	44	47	44	35	28	20	23	46	36
Casing Radiated										
100	50	47	50	42	38	38	30	25	46	36
75	50	42	44	37	31	28	21	25	42	32
50	46	37	37	32	24	17	21	24	36	26

Briza-22/26 08 (120V) - BABC.05515522, BABW.05515522, BBBC.05615526, BBBW.05615526										
	Sound Power Level, dB Ref. 1 pW								Sound Power	Sound Pressure
Fan Speed	Octave Band Frequency									
%	63	125	250	500	1000	2000	4000	8000	dBA	dBA
Inlet										
100	59	50	55	49	42	36	28	24	52	42
75	58	49	51	47	37	30	22	20	50	40

50	58	41	44	38	27	21	16	19	**46**	**36**
Discharge										
100	63	49	52	49	42	34	25	19	**52**	**42**
75	62	45	49	45	38	29	20	19	**49**	**39**
50	61	40	40	36	27	18	16	18	**45**	**35**
Casing Radiated										
100	52	41	43	39	33	28	24	26	**43**	**33**
75	50	41	41	36	28	23	19	25	**41**	**31**
50	49	37	34	27	18	15	18	25	**36**	**26**

Briza-22/26 10 (120V) - BABC.05519022, BABW.05519022, BBBC.05619026, BBBW.05619026

	Sound Power Level, dB Ref. 1 pW								**Sound Power dBA**	**Sound Pressure dBA**
Fan Speed	**Octave Band Frequency**									
%	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**		
Inlet										
100	58	53	59	56	51	47	36	24	**55**	**45**
75	56	48	53	48	41	36	26	20	**50**	**40**
50	55	43	46	43	34	29	20	20	**46**	**36**
Discharge										
100	61	49	55	53	52	45	34	26	**55**	**45**
75	60	44	49	47	44	36	26	23	**51**	**41**
50	59	40	43	43	38	30	21	23	**46**	**36**
Casing Radiated										
100	50	45	50	46	42	32	22	25	**47**	**37**
75	45	39	45	40	35	25	18	23	**44**	**34**
50	43	39	41	34	29	19	17	21	**41**	**31**

Ref: AHRI 260-2017, AHRI220-2014

Generated Sound Correction Rules

ΔL=LP(GN)-LP(BN)

If: ΔL≥15, K1=0

for 315Hz and below, and 6300Hz and Above, Use Eq. 14

"*" 6≤ΔL<15, K_1=use Eq. 14

"**" ΔL<6, K_1=1.26 and clearly stated in the upper bounds to the PWL

for 400 - 5000 Hz

"*" 10≤ΔL<15, K_1=use Eq. 14

"**" ΔL<10, K_1=0.46 and clearly stated in the upper bounds to the PWL

PRODUCT DATA

VF-1

H30 AC
Premium Efficiency
For Open Ceilings Up To 30ft

- REDUCED CARBON FOOTPRINT
- LOWER OPERATING COSTS
- INCREASED COMFORT
- LESS RUN TIME
- FAST PAYBACK

ZOO Fans' proprietary stator ring reduces centrifugal and angular flow, straightens the air column, boost air speed, and significantly increases throw.

ZOO Fans® energy-efficient fans create a concise column of air that gently mixes the air from ceiling-to-floor and wall-to-wall. ZOO fans destratify the air, eliminate hot and cold spots, and increase overall air circulation. **Noticeably improve comfort, and save energy!**

H-Series Fans deliver proven efficiency and performance that is unmatched by other fans

- ZOO fans are the only destratification fans that are independently tested in an industry-certified laboratory for guaranteed performance
- Variable speed controllable to dial-in comfort, individually, or in zones
- Easy to control—manually, automatically, or by a building automation system (BAS)
- Contributes to LEED

UL CERTIFIED
ENVIRONMENTAL PRODUCT DECLARATION
UL.COM/EPD

Motor

- Composite fan blades deliver even greater efficiency
- Thermal overload protection
- Sealed, lifetime lubricated bearings

Installation Hardware Included

- One (1) 8ft Cable with fast-locking Gripple® and attachment hardware
- Four (4) 15ft Stabilization Tethers with fast-locking Gripple® and attachment hardware

Options

- 6 ft Cord, 3-Prong Plug, 115V only
- Colors: Off-White or Black
- Exhaust Safety Grill (additional charge)
- Controllers (additional charge)

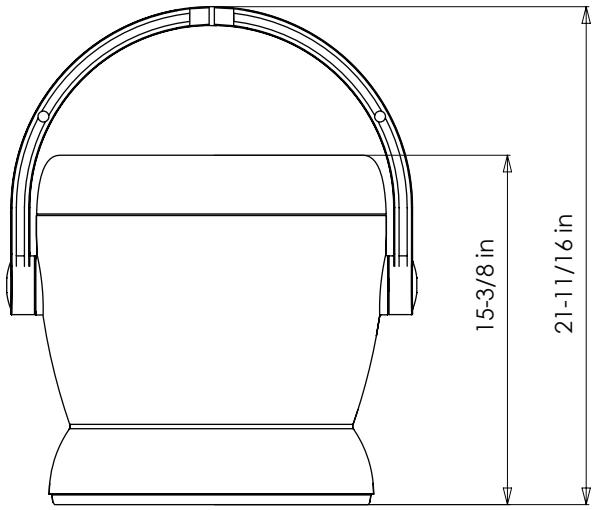
Housing

- Durable double-wall construction with UV treated, flame resistant plastic
- Patented design significantly outperforms the competition
- Intake Safety Grill is standard

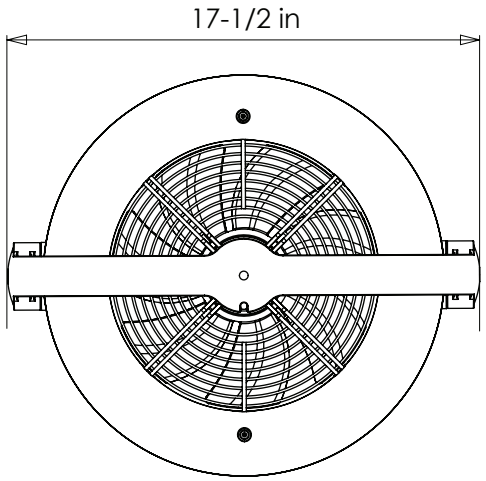
Coverage

Each fan covers from 1200-2500 sq. ft., depending on the following variables:

- Ceiling height and square footage
- Targeted number of air-turns per hour



Side View



Top View

Specifications

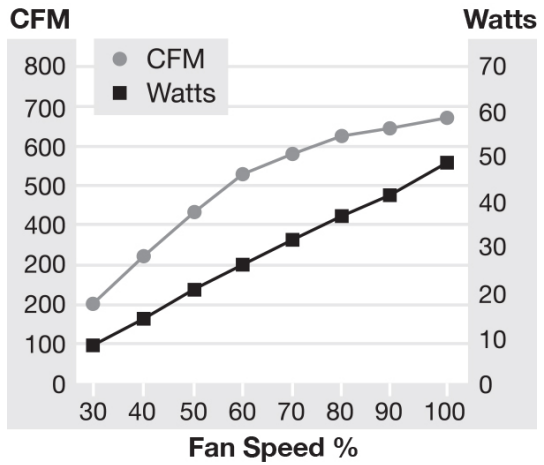
Model	H30 Premium Efficiency
Volts	115
Hz	60
Watts	46
Amps	0.44
CFM	670
Wt. (lbs.)	15

Sound Level Calculations

Based on non-reflective area

Hanging Height	dBA*
20 feet	44.3
25 feet	42.4
30 feet	40.8

Fan Speed vs CFM and Power Usage



DUCTSOX® Redefining Air Dispersion

DuctSox Corporation
4343 Chavenelle Road
Dubuque, IA 52002

zoofans.com
Phone: 303-557-1852
Toll Free: 855-966-3267

ZOOFANS® Efficiency and Performance

AS-1

SPIROTHERM

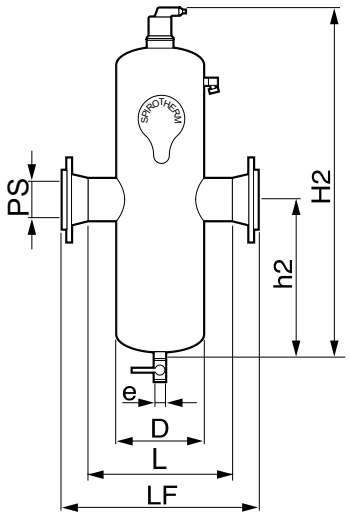
Submittal Data

VDT 2-12

Spirovent® Dirt
Air Eliminator and Dirt Separator

Job Name: CITY HALL HEATING SYSTEM UPGRADES
Engineer:
Contractor:
Representative:

Tag	Model	Flow	Size	Location



Specifications:

Shell	Steel
Vent Head	Brass
Float	Non-Ferrous
Seal	Viton
O Ring	Viton
Skim Valve	Brass
Coalescing Medium	Copper
Ball Valve	Brass
Max. Working Pressure	150 psig
Max. Operating Temperature	270°F

Notes:

PS – Pipe Size	2”	2 ½”	3”	4”	5”	6”	8”	10”	12”
D (inches)	6.3	6.3	8.6	8.6	12.8	12.8	16.0	20.0	24.0
H2 (inches)	25.3	25.3	31.4	31.4	41.7	41.7	51.8	67.5	79.7
h2 (inches)	10.4	10.4	13.6	13.6	18.9	18.9	24.2	32.1	38.2
L (inches)	10.2	10.2	14.6	14.6	---	---	---	---	---
LF (inches)	15.2	15.7	20.2	20.6	27.7	27.7	33.6	37.5	42.5
e (inches)	1	1	1	1	1	1	1	1	1
Weight NPT (lbs)	55	56	105	120	---	---	---	---	---
Weight Flg (lbs)	66	75	139	149	238	260	436	718	1,250
Volume (gallons)	1.8	1.8	6.6	6.6	20	20	40	79	132
Rec. Flow (gpm)	60	90	140	240	370	540	940	1,470	2,090
Model VDT---*	200	250	300	400	500	600	800	1000	1200

(Dimensions for reference only)

*VDT xxx MT: Threaded NPT
*VDT xxx FA: Flanged. ASME Section VIII, Division 1 Stamped and Registered

© 2022 Spirotherm, Inc., 462 Camden Dr, Bloomingdale, IL 60108

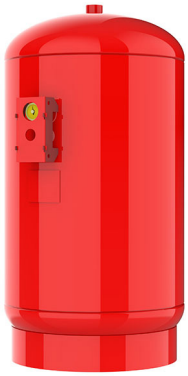
Bell & Gossett
a xylem brand

ET-1

SUBMITTAL A-346H

JOB: **REPRESENTATIVE:**

UNIT TAG:	ORDER NUMBER:	DATE:
ENGINEER:	SUBMITTED BY:	DATE:
CONTRACTOR:	APPROVED BY:	DATE:



Series "D" (ASME) Pressurized Expansion Tanks

Not for potable water systems

DESCRIPTION

Series "D" expansion tanks are ASME rated precharged diaphragm-type pressure vessels. The Series "D" 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 diaphragm separates system water from the tank air charge thereby eliminating waterlogging problems. All Series "D" expansion tanks include an integrated bladder integrity monitor and are available with sight glass and/or seismic restraints.

CONSTRUCTION

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

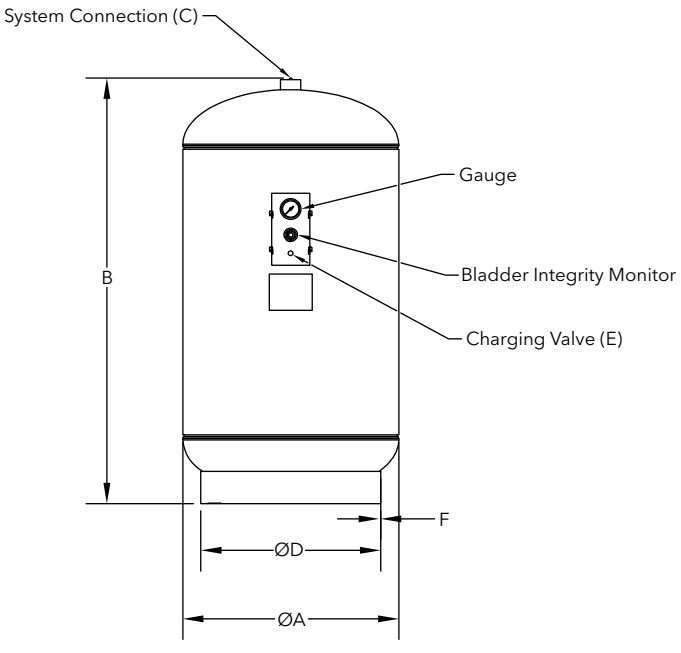
MAXIMUM OPERATING LIMITS

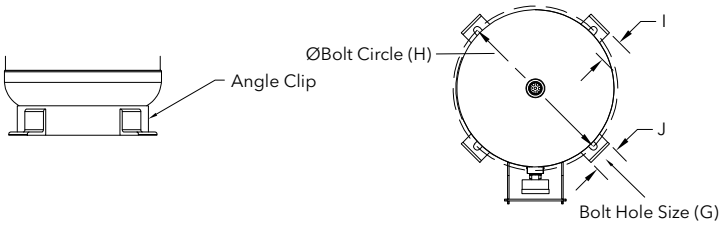
Maximum Design Pressure: 125 PSI (862 kPa)
Design Temperature: 240°F (115°C)

SCHEDULE

Model No.	Part Numbers				Volume gal (L)		Tagging Information	Quantity
	PRESSURIZED EXPANSION TANKS	WITH SIGHT GLASS	WITH SEISMIC RESTRAINTS	WITH SIGHT GLASS & SEISMIC RESTRAINTS	Tank	Acceptance		
D-15	116298	116311	116324	116337	7.8 (30)	6.3 (24)		
D-20	116299	116312	116325	116338	11 (42)	8.8 (33)		
D-40	116300	116313	116326	116339	25 (95)	20.2 (76)		
D-60	116301	116314	116327	116340	35 (132)	28 (106)		
D-80	116302	116315	116328	116341	45 (170)	36 (136)		
D-100	116303	116316	116329	116342	60 (227)	48.5 (184)		
D-120	116304	116317	116330	116343	70 (265)	56.5 (214)		
D-144	116305	116318	116331	116344	80 (303)	65 (246)		
D-180	116306	116319	116332	116345	90 (341)	73 (276)		
D-200	116307	116320	116333	116346	115 (435)	93 (352)		
D-240	116308	116321	116334	116347	140 (530)	113.5 (430)		
D-260	116309	116322	116335	116348	158 (598)	128 (485)		
D-280	116310	116323	116336	116349	211 (799)	171 (647)		

xylem





NOTE
Tanks are factory pre-charged at 40 PSI (276 kPa).
Sight glass and seismic restraints available.
Tanks can also be installed in the horizontal position only.

DIMENSIONS AND WEIGHTS

Model	A in (mm)	B in (mm)	C (NPTM)	Charging Valve E	D in (mm)	F in (mm)	G in (mm)	H in (mm)	I in (mm)	J in (mm)	Ship Wt. lbs (kg)	Flooded Wt.* lbs (kg)
D-15	12 (305)	19 (483)	3/4	.302"-32 NC	10 (254)	0.14 (4)	9/16 (14)	12 (305)	2 (51)	2 (51)	42 (19)	107 (49)
D-20	12 (305)	25 (638)	3/4	.302"-32 NC	10 (254)	0.14 (4)	9/16 (14)	12 (305)	2 (51)	2 (51)	52 (24)	144 (65)
D-40	16 (406)	33 (838)	1	.302"-32 NC	14 (356)	0.14 (4)	9/16 (14)	16 (406	2 (51)	2 (51)	84 (38)	292 (132)
D-60	16 (406)	44 (1,118)	1	.302"-32 NC	14 (356)	0.14 (4)	9/16 (14)	16 (406	2 (51)	2 (51)	97 (44)	389 (176)
D-80	20 (508)	38 (965)	1	.302"-32 NC	18 (457)	0.14 (4)	9/16 (14)	20 (508)	2 (51)	2 (51)	148 (67)	523 (237)
D-100	20 (508)	49 (1,245)	1	.302"-32 NC	18 (457)	0.14 (4)	9/16 (14)	20 (508)	2 (51)	2 (51)	175 (79)	675 (306)
D-120	24 (610)	46 (1,168)	1-1/2	.302"-32 NC	22 (559)	0.14 (4)	9/16 (14)	24 (610)	2 (51)	2 (51)	259 (117)	842 (382)
D-144	24 (610)	49 (1,245)	1-1/2	.302"-32 NC	22 (559)	0.14 (4)	9/16 (14)	24 (610)	2 (51)	2 (51)	268 (122)	934 (424)
D-180	24 (610)	52 (1,321)	1-1/2	.302"-32 NC	22 (559)	0.14 (4)	9/16 (14)	24 (610)	2 (51)	2 (51)	283 (128)	1,033 (468)
D-200	24 (610)	66 (1,676)	1-1/2	.302"-32 NC	22 (559)	0.14 (4)	9/16 (14)	24 (610)	2 (51)	2 (51)	325 (147)	1,283 (582)
D-240	24 (610)	78 (1,981)	1-1/2	.302"-32 NC	22 (559)	0.14 (4)	9/16 (14)	25 (635)	3 (76)	3 (76)	362 (164)	1,528 (693)
D-260	30 (762)	63 (1,600)	1-1/2	.302"-32 NC	24 (610)	0.14 (4)	9/16 (14)	27 (686)	3 (76)	3 (76)	591 (268)	1,907 (865)
D-280	30 (762)	81 (2,057)	1-1/2	.302"-32 NC	24 (610)	0.14 (4)	9/16 (14)	27 (686)	3 (76)	3 (76)	752 (341)	2,510 (1,138)

Dimensions subject to change. Not to be used for construction purposes.
*Approximate weight 100% full occurs if bag fails or if air charge is lost.

xylem
Let's Solve Water

Xylem Inc.
8200 N. Austin Avenue
Morton Grove, IL 60053
Tel: (847) 966-3700 Fax: (847) 965-8379
www.xylem.com/bellgossett

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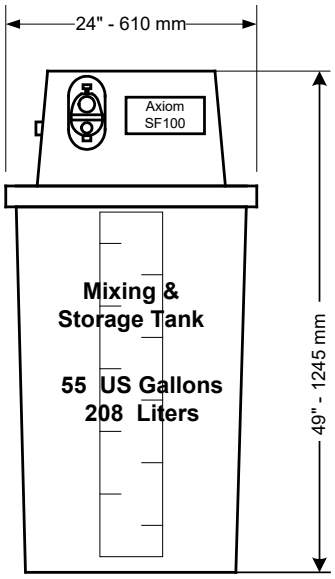
GMT-1

SF100 HYDRONIC SYSTEM FEEDER TECHNICAL INFORMATION

DIMENSIONS :

WEIGHT : 22.6 kg, 50 lbs (Empty)



PUMP ELECTRICAL :

115/60/1, 0.7 amps
3-prong plug and cord

PUMP PERFORMANCE :

0.09 l/s (1.4 gpm) @ free flow
0.06 l/s (1.0 gpm) @ 345 kPa (50 psig)
Self-priming up to 2.1 m (7 feet)
Maximum liquid temp. 77 C (170 F)

Certified to CAN/CSA C22.2 No. 68

Conforms to UL 739901055

SPECIFICATION :

Hydronic system feeder shall be AXIOM INDUSTRIES LTD. Model SF100. System shall include 208 litre (55 US gallon) storage/mixing tank with cover; pump suction hose with inlet strainer; pressure pump with thermal cut-out; integral pressure switch; integral check valve; cord and plug; pre-charged accumulator tank with EPDM diaphragm; manual diverter valve for purging air and agitating contents of storage tank; pressure regulating valve adjustable (35 – 380 KPa; 5 – 55 psig) complete with pressure gauge; built-in check valve; union connection; 12 mm (½") x 900 mm (36") long flexible connection hose with check valve; low level pump cut-out. Pressure pump shall be capable of running dry without damage. Power supply 115/60/1 0.7 A. Unit shall be completely pre-assembled and certified by a recognized testing agency to CSA standard C22.2 No 68.

OPTIONAL ACCESSORIES :

- ☐ **2PRV** -- Second Pressure Reducing Valve, Pressure Gauge, System Connector Hose and Check Valve to allow for independent pressure supply to a second system.
- ☐ **RIA10-1-SAA** -- Low level Alarm Panel c/w Remote Monitoring Dry Contacts and Selectable Audible Alarm

LIMITED WARRANTY :

The SF100 is warranted against defects in materials and workmanship for one year.

Project _____ **Location** _____
Consultant _____ **Contractor** _____
Unit Tag _____ **Sales Agent** _____

© Axiom Industries Ltd

Features of the Improved WATCHMAN

- Up to 30 psig discharge
- Same Low Inlet Height
- Compact Design, requires less floor space
- Choice of Inlet and Overflow Locations
- Easier to Install:
  shorter pump manifolding on duplex units
  simplified piping on all units
- Reliable and Proven Watchman Pump and Motors
- 20 Year Receiver Warranty against failure due to corrosion

WC-6-20B

WCD-12-20B

WCD-30-30B

Hoffman Specialty® Watchman® Series WC™ Condensate Units

6,000, 8,000, 12,000, AND 30,000 SQ. FT. EDR, SIMPLEX AND DUPLEX DESIGNS

Bell & Gossett
a xylem brand

Hoffman Specialty® WATCHMAN®
The Recognized Name in Condensate Pumps

QUALITY FEATURES THAT MAKE THE HOFFMAN WATCHMAN THE STANDARD OF THE INDUSTRY

Availability: Factory and Local Stock

Corrosion Resistance: Cast Iron Receivers

Ease of Installation: Inlet, Vent and Overflow Openings
Shorter pump manifolding with duplex units

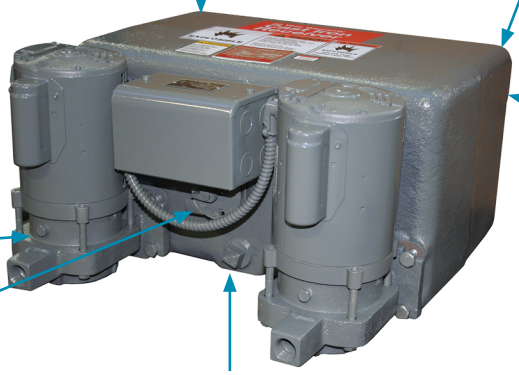
Ease of Service:
Vertical Pull-out Pumps
Carbon/Ceramic Mechanical Seals
Drain Connection
Flange Mounted Pumps

WATCHMAN® FEATURES TO COMPARE

Reliable Operation
100% Factory wired and tested to assure reliable operation. Thousands installed and operating for years.

Inlet
Low height, NPT inlet for easy return line piping.

Vent & Overflow
Separate NPT connection to provide a secondary vent ensuring safe operation.



Centrifugal Pumps
Built to handle high temperature 200°F condensate. Pumps use carbon/ceramic mechanical seals designed for 250°F temperatures for maximum life.

Cast Iron Receivers
Close grained, corrosion-resistant cast iron receivers warranted for 20 years from date of shipment against failure due to corrosion.

Pump Control
Durable, double pole float switch or mechanical alternator (duplex units). Factory set for proper operation.

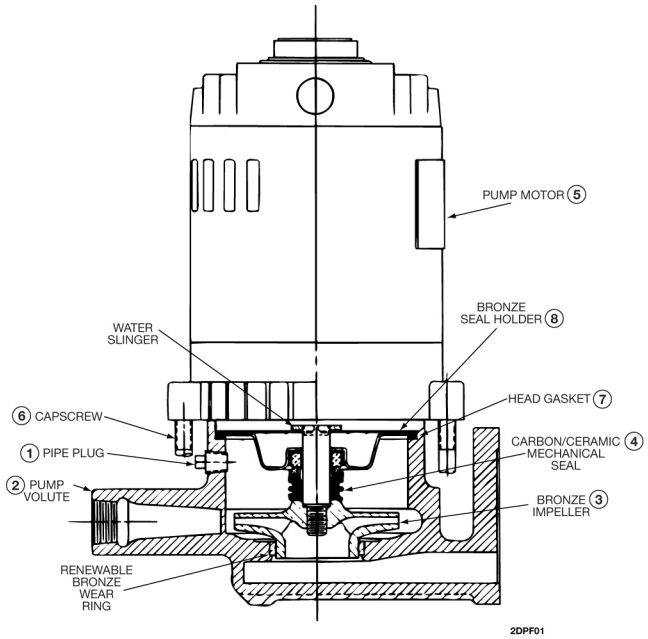
Drain Connection
NPT drain connection to allow removal of water when servicing.

Optional Features
Inlet Basket Strainers or "Y" Strainer Control Panels for wall mounting. (Order Separately)

Hoffman Specialty WATCHMAN Centrifugal Pumps

Hoffman Specialty centrifugal pumps are close coupled, vertical design equipped with enclosed bronze impellers, renewable bronze wear rings, stainless steel shafts and carbon/ceramic mechanical seals. Each pump is individually tested prior to factory shipment.

All pump internals can be fully serviced without disturbing the discharge piping. Motors are quiet, ball bearing type with a dual voltage rating and thermal overload protection.



ITEM	QTY.	DESCRIPTION	PART NO.
1	1	Plug	P39040
2	1	Volute & WR ASM Watchman	DP1665
3	1	Impeller $3^{11}/_{16}$ Dia.	DP0321
4	1	Seal and Gasket Kit	180013
5	1	Motor	DM0005
6	4	Capscrew	DJ0083
7	1	Gasket	DG0092
8	1	Seal Holder	DP1966

1950 lb/hr
1950lb/hr / 8.3lb/gal / 60min/hr = 3.9 gpm
2X SF = 8 gpm max
Approx. run time: 1 min on, 3 min off

Selection Tables

Model Number	System Sq. Ft. EDR	Number of Pumps	Disch. Pres. (psig)	Pump Capacity (GPM)	Receiver Capacity (Gal.)	Motor HP	Accessories
WC6-20B	6,000	Single	22	9	6	1/3	Float switch
WC8-20B	8,000	Single	21	12	9	1/3	Float switch
WC12-20B	12,000	Single	20	18	14	1/3	Float switch
WCD12-20B-MA	12,000	Duplex	20	18	14	1/3	Mechanical alternator
WCD30-30B-MA	30,000	Duplex	30	30	23	1	Mechanical alternator

Watchman condensate units are factory wired for 115 volts and may be field converted to 230 volts 1 phase.

SIMPLEX UNIT FEATURES

- **Cast Iron Receiver**
  - Low Inlet Height with alternate location.
  - Vent and Overflow Openings to meet local code requirements for a secondary vent.
  - 20 Year Warranty against failure due to corrosion.
  - Model WC12-20B allows for the addition of a second pump at a later date.
- **One Pump and Motor Assembly**
  - Close Coupled, Bronze Fitted Pump for low maintenance.
  - Renewable Bronze Wear Ring to maintain efficiency.
  - Stainless Steel Motor Shaft to prevent corrosion in aggressive condensate.
  - Carbon/Ceramic Seal Faces for Longer Life.
  - Serviceable without disturbing piping.
- **Double Pole Float Switch**
  - Stainless Steel Float and Rod to prevent corrosion in aggressive condensate.
  - Factory preset or externally adjustable.
  - Proven durability in pump control.
    (1) Starts and Stops the pump on demand.

DUPLEX UNIT FEATURES

- **Cast Iron Receiver**
  - Low Inlet Height with alternate location.
  - Vent and Overflow Openings to meet local code requirements for a secondary vent.
  - 20 Year Warranty against failure due to corrosion.
- **Two Pump and Motor Assemblies**
  - Close Coupled, Bronze Fitted Pump for low maintenance.
  - Renewable Bronze Wear Ring to maintain efficiency.
  - Stainless Steel Motor Shaft to prevent corrosion in aggressive condensate.
  - Carbon/Ceramic Seal Face for Longer Life.
  - Shorter Pump discharge manifold to installation time.
  - Serviceable without disturbing piping.
- **Double Pole Mechanical Alternator**
  - Stainless Steel Float and Rod to prevent corrosion in aggressive condensate.
  - Factory preset or externally adjustable.
  - Proven durability in pump control.
    (1) Automatically alternates operation of the two pumps for even wear.
    (2) Provides simultaneous operation of both pumps to deliver double capacity under peak conditions.
    (3) Automatically operates the second pump should the first pump fail.

Part 1 – General

1.1 SECTION INCLUDES

A. Unit shall be a Hoffman Specialty Watchman Series WC Simplex or Duplex condensate pumping unit manufactured by Bell & Gossett and shall consist of:

1. One (1) cast iron receiver
2. One (1) or two (2) water pump(s)
3. Float actuated pump switch as hereafter specified.
4. Each unit shall be factory tested.

Part 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with these specifications, the following manufacturers shall be acceptable:

1. Bell & Gossett Hoffman Specialty Watchman

2.2 COMPONENTS

A. CAST IRON RECEIVER

1. The condensate receiver shall be closed grain cast iron construction warranted for 20 years from date of shipment against failure due to corrosion.
2. Receiver shall be equipped with:
   a. 2 NPT Inlet
   b. 2 NPT Vent
   c. Receiver shall be sized for 1-minute net storage based upon system return rate.
   d. Receiver shall have:
   e. Overflow opening to provide a means of secondary venting all on a common side of the receiver.
   f. Pump control
      1. Simplex Unit - (1) Externally adjustable 2-pole float switch.
      2. Duplex Unit - (1) Externally adjustable mechanical alternator to automatically alternate operation of the two pumps and provide simultaneous operation of both pumps to deliver double capacity under peak conditions.

B. PUMP(S)

1. The centrifugal pumps shall be flanged mounted on the receivers.
2. Pump(s) shall be so constructed to permit access to the impeller and other interior parts without break in the discharge pipe connections.
3. Pumps shall be:
   a. close coupled vertical design
   b. bronze fitted
   c. permanently aligned
   d. stainless steel shaft
   e. enclosed bronze impeller
   f. renewable bronze wear ring
   g. carbon/ceramic mechanical shaft seal shall be rated for 250°F (121°C)

C. MOTOR(S)

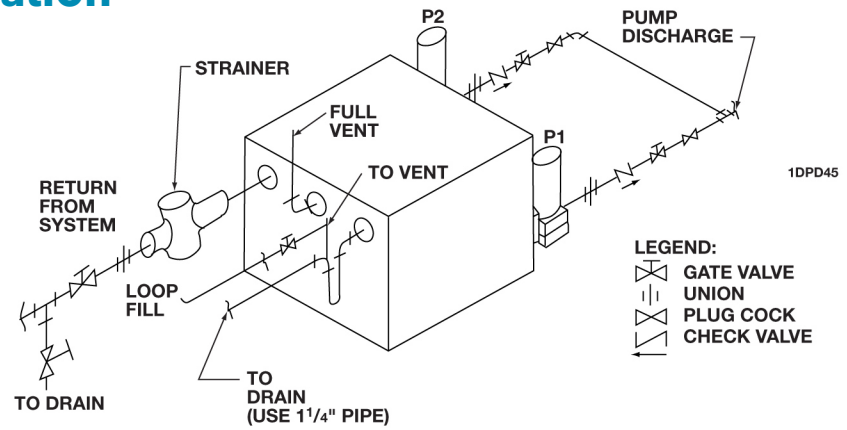
1. Each pump shall be closed coupled to a vertical drip proof motor.
2. Motor(s) shall be:
   a. 3500 RPM single phase
   b. 115/230 volt
   c. factory wired for 115 volts
   d. field convertible to 230 volts
   e. Motor shall have internal thermal overload protection

Part 3 – EXECUTION

Manufacturer shall furnish complete elementary piping diagrams and installation and operation instructions. Unit shall be a Hoffman Specialty Series WC, WCD as manufactured by Bell & Gossett, Morton Grove, IL.

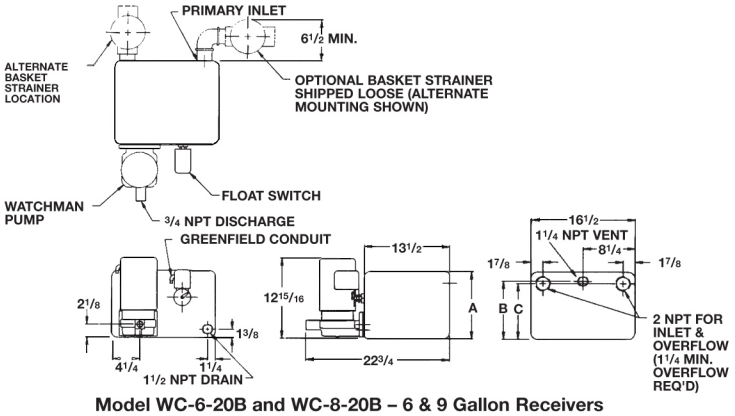
Typical Installation

NOTE – ENTIRE MAIN RETURN MUST HAVE A GRADUAL PITCH DOWN TOWARDS THE PUMP



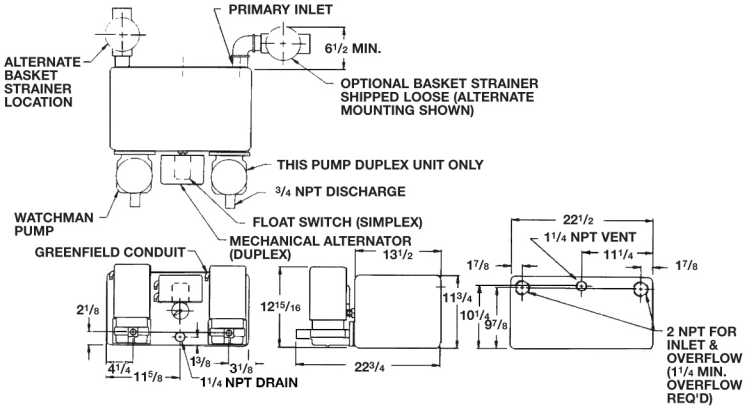
Roughing-in Dimensions

All dimensions in inches.

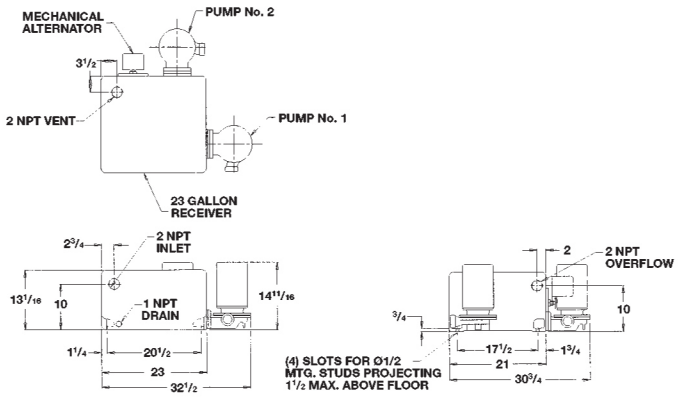


Model WC-6-20B and WC-8-20B – 6 & 9 Gallon Receivers

GAL.	A	B	C
6	8 9/16	7 1/16	6 11/16
9	10 7/8	9 3/8	9



Model WC-12-20B and WCD-12-20B MA – 14 Gallon Receivers



Model WC-30-30B MA – 23 Gallon Receivers

We value your feedback. Please take our 3 question survey at **bellgossett.com/survey** to let us know how we are doing.

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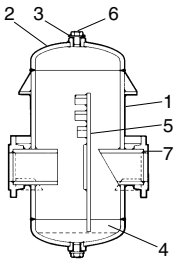
spirax sarco®

Steel Separator
S4A

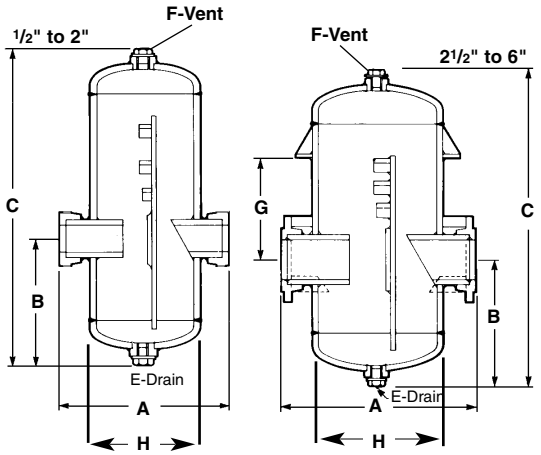
Moisture Separators are used to improve the quality of steam or compressed air either within the distribution system or on the supply inlet to equipment. Removal of moisture is by a series of baffles on which the suspended water droplets impinge and fall out by gravity to the drain, which must be piped to a trap.

Model ➪	S4A	
PMO	600 psig	150/300 psig
Sizes	1/2" to 2"	2-1/2" to 6"
Connections	NPT, SW	ANSI 150 ANSI 300
Construction	Fabricated steel body	
ASME code stamped	600 psig	150 psig/300psig
Options stamped.	2-1/2" to 6" to 600 psig ASME code Gauge Glass Assembly 2-1/2" to 6"	



Typical Applications

On steam mains, as a drip station ahead of steam pressure reducing or temperature control valves. On the steam inlet to laundry presses and other process equipment which require dry saturated steam. On the compressed air supply to sensitive instruments and before filters.



Construction Materials

No.	Part	Material	
1	Body (1/2" to 2")	Steel	SA-106 GRB
	(2-1/2" to 6")		ASTM A 53 GRB
2	End Caps (1/2" to 6")	Steel	SA-234 WPB
3	Coupling	Steel	SA-105
4	Screen (4" & 6")	Steel	ASTM A 569
5	Baffle	Steel	ASTM A 569
6	Plug	Steel	ASTM A105
7	End Connections (1/2" to 2")	Steel	SA-105
	(2-1/2" to 6")		ASTM A105

Designed to Section VIII Division I of the ASME Boiler & Pressure Vessel Code.

Pressure Shell Design Conditions

(1/2" to 2") **NPT and Socket Weld**

MAWP
Max. allowable working pressure
600 psig/*41.4 barg*
-20˚F to 650˚F/*-29˚C to 344˚C*

(2-1/2" to 6") **ANSI 150 flanged**
150 psig/*10.4 barg*
-20˚F to 650˚F/*-29˚C to 344˚C*

ANSI 300 flanged
300 psig/*20.7 barg*
-20˚F to 650˚F/*-29˚C to 344˚C*

Optional Pressure Shell Design Conditions

(2-1/2" to 6") **ANSI 600 Flanged**

MAWP
Max. allowable working pressure
600 psig/*41.4 barg*
-20˚F to 650˚F/*-29˚C to 344˚C*

Dimensions (nominal) in inches and millimeters

Size	Conn.	A	B	C	E	F	G	H	Weight
1/2" *15*	Scr/SW	9.0 *229*	5.2 *132*	10.6 *269*	3/4"	3/4"	—	2.5"	9.0 lb *4.1 kg*
3/4" *20*	Scr/SW	9.3 *236*	5.9 *150*	12.1 *307*	3/4"	3/4"	—	2.5"	10.0 lb *4.5 kg*
1" *25*	Scr/SW	11.8 *300*	6.0 *152*	14.1 *358*	3/4"	3/4"	—	4"	19.0 lb *8.6 kg*
1-1/4" *32*	Scr/SW	13.3 *338*	7.1 *180*	16.3 *414*	3/4"	3/4"	—	5"	30.0 lb *13.6 kg*
1-1/2" *40*	Scr/SW	15.4 *391*	7.6 *193*	19.0 *483*	1"	3/4"	—	6"	43.0 lb *19.5 kg*
2" *50*	Scr/SW	15.9 *404*	8.1 *206*	20.6 *523*	1"	3/4"	—	6"	50.0 lb *22.7 kg*
2-1/2" *65*	ANSI 150	22.5 *572*	9.4 *239*	24.5 *622*	1"	3/4"	7.1 *180*	8.7"	109.0 lb *49.4 kg*
	ANSI 300	22.5 *572*	9.4 *239*	24.5 *622*	1"	3/4"	7.1 *180*		112.0 lb *50.8 kg*
	ANSI 600	22.5 *572*	9.9 *251*	25.6 *650*	1"	3/4"	7.1 *180*		113.0 lb *51.3 kg*
3" *80*	ANSI 150	25.3 *643*	12.0 *305*	28.6 *726*	2"	3/4"	7.9 *201*	10.8"	163.0 lb *73.9 kg*
	ANSI 300	25.3 *643*	12.0 *305*	28.8 *732*	2"	3/4"	7.9 *201*		169.0 lb *76.7 kg*
	ANSI 600	25.3 *645*	12.7 *323*	29.9 *759*	2"	3/4"	7.9 *201*		189.0 lb *85.7 kg*
4" *100*	ANSI 150	29.0 *737*	12.6 *320*	31.2 *792*	2"	1-1/2"	8.8 *224*	12.8"	237.0 lb *107.5 kg*
	ANSI 300	29.0 *737*	12.6 *320*	31.2 *792*	2"	1-1/2"	8.8 *224*		256.0 lb *116.1 kg*
	ANSI 600	29.0 *737*	13.2 *335*	32.1 *815*	2"	1-1/2"	9.0 *229*		297.0 lb *134.7 kg*
6" *150*	ANSI 150	35.8 *909*	12.3 *312*	36.7 *932*	2"	1-1/2"	11.4 *290*	16.0"	365.0 lb *165.6 kg*
	ANSI 300	35.8 *909*	12.4 *315*	36.9 *937*	2"	1-1/2"	11.4 *290*		401.0 lb *181.9 kg*
	ANSI 600	35.8 *909*	13.0 *330*	37.8 *960*	2"	1-1/2"	11.4 *290*		551.0 lb *249.9 kg*

Local regulation may restrict the use of this product below the conditions quoted. Limiting conditions refer to standard connections only.
In the interests of development and improvement of the product, we reserve the right to change the specification.

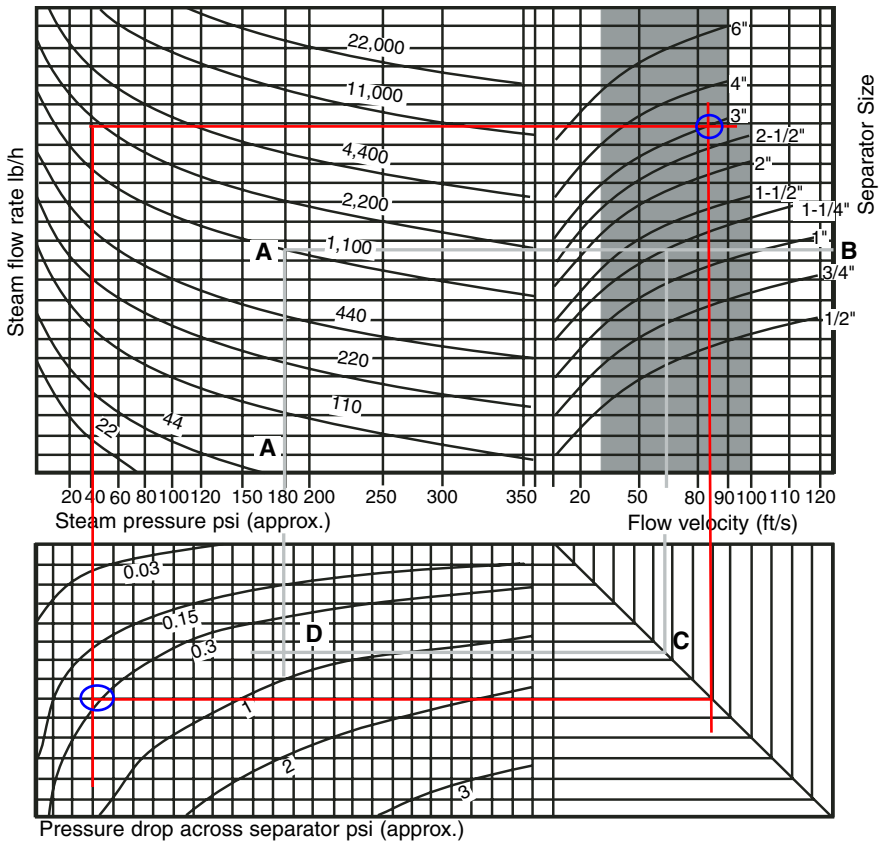
Steel Separator
S4A

S4A Steam Sizing Chart

Sizing Example for Model S4A

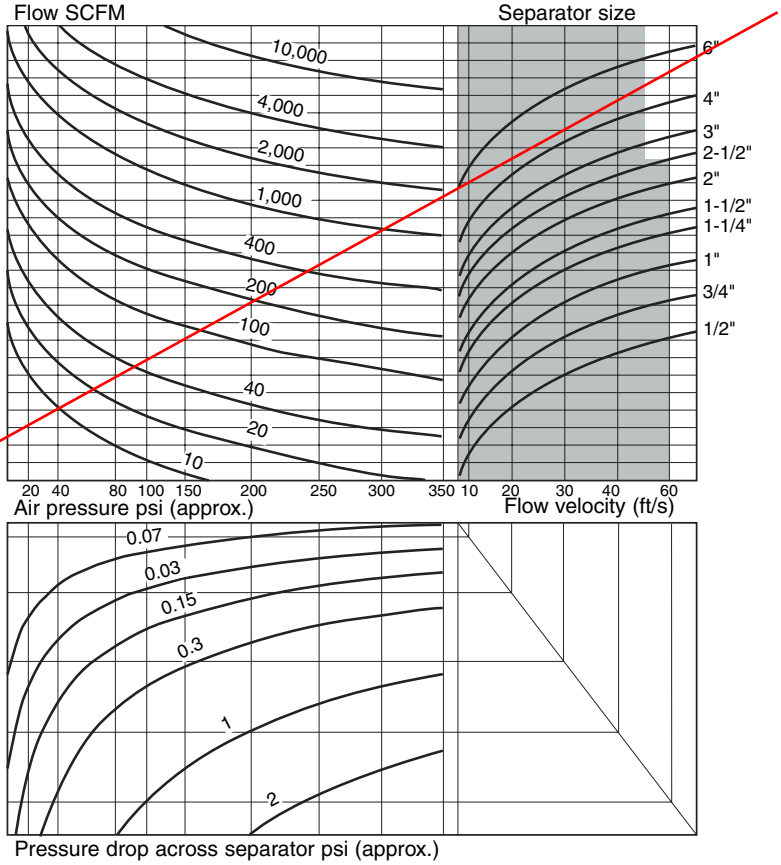
1. Taking a steam pressure of 180 psig and flow rate of 1100 lb/h draw line A-A.
2. Draw horizontal line A-B.
3. Any separator curve that is bisected by line A-B within the shaded area will operate at near 100% efficiency.
4. Line velocity for any size can be determined by dropping a vertical line B-C (eg. 60 ft/s for 1-1/4" unit).
5. Pressure drop is determined by plotting lines C-D and A-D. The point of intersection is the pressure drop across the separator, ie: 0.5 psi.
6. Separators should be selected on the basis of the best compromise between line size, velocity and pressure drop for each application.

The shaded area denotes recommended selection for better than 99% separation efficiency.



S4A Separator Flow Velocity & Pressure Drop for compressed Air

Note: Any Separator curve that is bisected within the shaded area will operate at near 100% efficiency.



Sample Specification

Moisture Separator shall be of the high efficiency internal baffle type having a pressure drop that does not exceed an equivalent length of pipe. Separator shall be of steel construction in accordance with Section VIII, Division I of the ASME Boiler and Pressure Vessel Code. ASME Code Stamped for maximum working pressures of 150, 300, or 600 psig. A screwed bottom drain connection shall be provided for the installation of a trap to discharge accumulated liquid. A Spirax Sarco Float Operated Drain Trap and "Y" Type Strainer shall be installed on the drain connection.

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Spirax Sarco, Inc., 1150 Northpoint Blvd, Blythewood, SC 29016 **Telephone: (803) 714-2000 FAX (803) 714-2222**

Pilot Operated Pressure Regulator
½" to 4" 25P

The 25P is a self-actuated pilot-operated pressure regulator. Downstream pressure is fed back through an external sensing line to the pressure pilot, which adjusts the opening of the main valve so as to maintain the set pressure. The main valve can close tight for ANSI/FCI 70-2 Class IV shut off when steam is not required.

Model	25P			
Sizes	½" to 2"	2½", 3", 4"	½" to 2"	2", 2½", 3", 4"
Connections	NPT	ANSI 125 flgd.	NPT	ANSI 300 flgd.
Construction	Cast Iron		Cast Steel	
Options		ANSI 250 flgd.		ANSI 150 flgd. (excludes 2")

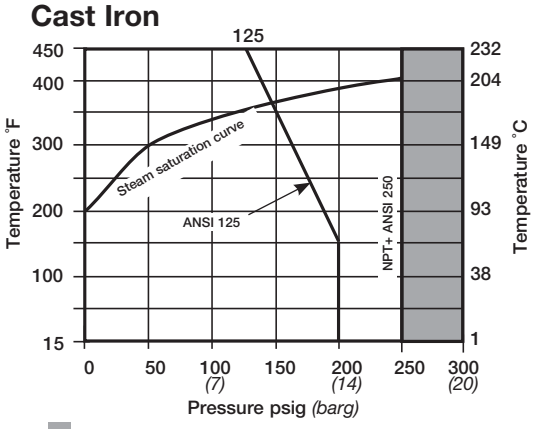
Typical Applications

The 25P is a reliable, accurate regulator to reduce steam from a high supply pressure to the most efficient operating pressure of the equipment, and to protect the equipment from dangerously high pressures.

Capacities

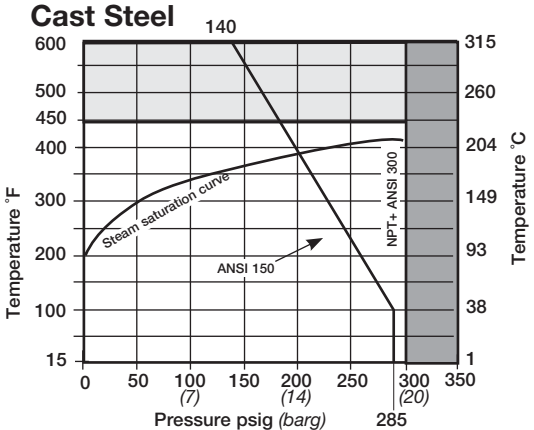
For selection and sizing data, see TIS 3.030.

Cast Iron



The product should not be used in shaded area.

Cast Steel



The product should not be used in shaded area.

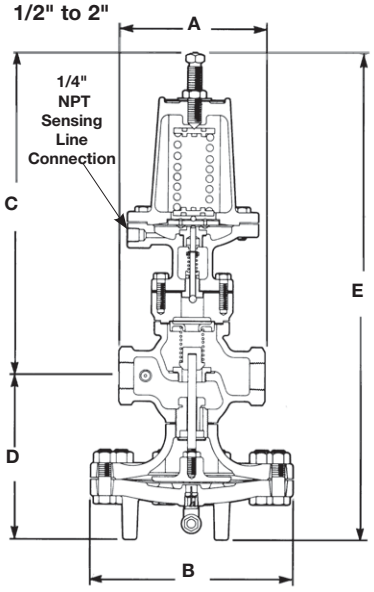
For operation in this region, stainless steel transmission tubing need be fitted.

Note: Maximum temperature for Stainless Steel tubing is 600°F

Downstream Pressure Ranges

For the following downstream pressures, three color-coded pilot valve springs are available:

Yellow: 3 to 30 psi
Blue: 20 to 100 psi
Red: 80 to 250 psi



Dimensions (nominal) in inches and millimeters

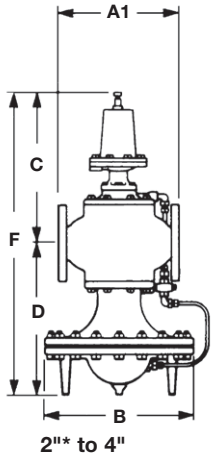
Size	A	ANSI 125 ANSI 150 A1	ANSI 250 ANSI 300 A1	B	C	D	E	Weight Cast Iron	Weight Cast Steel
½", ¾"	5.5 140	– –	– –	7.6 194	12.2 310	6.2 157	18.4 467	32 lb 14.5 kg	35 lb 15.9 kg
1"	6.0 152	– –	– –	8.6 219	12.1 308	6.75 171	18.9 479	39 lb 17.7 kg	43 lb 19.5 kg
1¼", 1½"	7.25 184	– –	– –	8.6 219	12.7 322	7.1 179	19.75 502	44 lb 20 kg	48 lb 21.8 kg
2"	8.5 216	– –	9.0 228	10.6 270	13.3 338	8.2 208	21.5 546	69 lb 31.3 kg	75 lb 34 kg
2½"	– –	10.9 276	11.5 292	13.6 346	14.0 356	13.9 354	27.9 710	157 lb 71.2 kg	171 lb 77.6 kg
3"	– –	11.75 298	12.5 318	13.6 346	13.9 354	14.4 367	28.4 721	188 lb 85.3 kg	205 lb 93 kg
4"	– –	13.9 352	14.5 368	15.6 397	15.25 387	16.1 410	31.4 797	284 lb 129 kg	309 lb 140 kg

Local regulation may restrict the use of this product below the conditions quoted. Limiting conditions refer to standard connections only.
In the interests of development and improvement of the product, we reserve the right to change the specification.

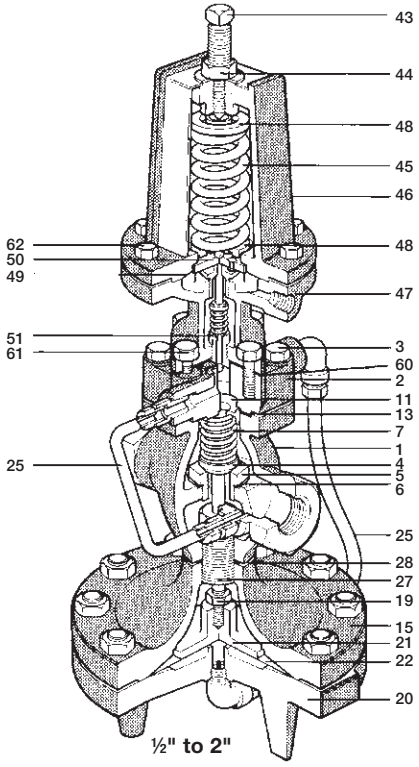
Pilot Operated Pressure Regulator
½" to 4" 25P

Sample Specification

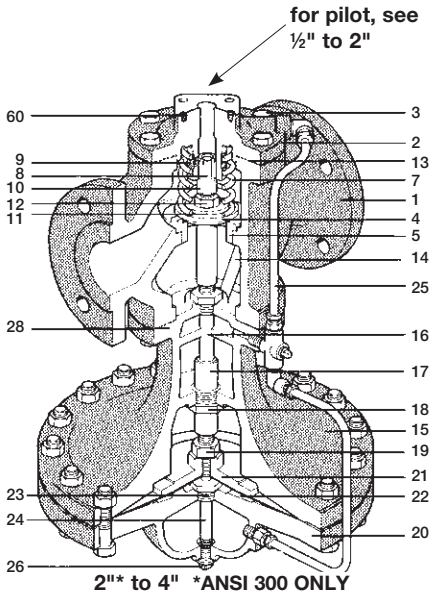
The pressure regulator shall be of the pilot-actuated diaphragm operated type. The main valve shall be single-seated with hardened stainless steel trim; the regulator body shall be cast iron (cast steel). The pilot shall be bolted directly to the regulator body. The regulator shall be capable of dead-end shut-off.



2"* to 4"



½" to 2"



2"* to 4" *ANSI 300 ONLY

Construction Materials

No.	Part	Material	
1	Valve Body	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A216 Gr WCB
2	Cover	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A216 Gr WCB
3	Cover Bolts	Steel	ASTM A449
4	Main Valve Head	Stainless Steel	
5	Main Valve Seat	Stainless Steel	
6	Main Valve Seat Gasket	Copper	
7	Valve Return Spring	Stainless Steel	
8	Valve Stem	Stainless Steel	
9	Strainer Screen	Stainless Steel	
10	Valve Stem Sleeve	Stainless Steel	
11	Spring Guide	Cast Iron ½"-2"	
		CRS 2"* - 4"	
12	Nut	Steel	
13	Cover Gasket	Graphite	
14	Pressure Equalizer Pipe	Stainless Steel	
15	Upper Diaphragm Case	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A216 Gr WCB
16	Stem Bushing (2½" - 4" Cast Steel only)	Stainless Steel	
17	Diaphragm Plate Stem	Stainless Steel	
18	Diaphragm Stem Guide	Stainless Steel	
19	Nut	Brass ½" - 2"	
		Steel 2"* - 4"	
20	Lower Diaphragm Case	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A216 Gr WCB
21	Diaphragm Plate	Brass ½" - 2"	
		C.I. 2"* - 4"	
22	Main Diaphragm (2 ply)	Stainless Steel	
23	Bushing	CRS	
24	Tube & Orifice	Stainless Steel	
25	Tubing Assembly	Copper	
		Brass	
	(optional for cast steel)	Stainless Steel	

No.	Part	Material	
26	Plug (Cast Iron)	Brass	
	(Cast Steel)	Steel	
27	Connector Stud	Stainless Steel	
28	Body Gasket	½" - 2" Copper Clad	
		2"* - 4" Graphite	
43	Adjustment Screw	Stainless Steel	
44	Jam Nut	Brass	
45	Pilot Valve Spring	Steel	
46	Upper Diaphragm Case	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A216 Gr WCB
47	Lower Diaphragm Case	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A216 Gr WCB
48	Spring Plate	Steel	
49	Diaphragm	Stainless Steel	
50	Diaphragm Plate	Brass	
51	Pilot Head Spring	Stainless Steel	
60	Pilot Gasket	Graphite	
61	Pilot Mounting Screws	Steel	
62	Diaphragm Case Screws	Steel	ASTM A449

Installation

The regulator should be installed in a horizontal line with suitable bypass and isolating valves. A steam trap should be installed upstream to prevent condensate from reaching the regulator. The trap and regulator should both be protected with a strainer. The pressure sensing line should be located in a straight section of the downstream piping at least 10 pipe diameters from the nearest fitting. Complete installation instructions are given in IM-3-000-US.

Maintenance

Complete installation and maintenance instructions are given in IM-3-000-US, a copy of which is supplied with each regulator. Available spare parts are shown on TI-1-1120-US & TI-3-0271-US.

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Sizing and Selection Chart
25P, 25PE, 25PA, and all Combinations

Capacities

Inlet Steam Pressure psig	Outlet Steam Pressure psig	NOMINAL VALVE SIZE 1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"
	C.V. Factors Ï	3.48	6.5	10.5	14	20	35	56	74	115	260
	10	95	175	285	380	540	950	1,500	2,000	3,100	7,000
15	5	135	250	405	545	780	1,365	2,185	2,890	4,480	10,170
	3	155	285	465	620	880	1,550	2,470	3,260	5,080	11,440
	12	120	230	365	490	700	1,225	1,960	2,590	4,025	9,100
20	8	155	290	470	630	900	1,575	2,520	3,330	5,175	11,700
	0-5	180	335	540	720	1,025	1,795	2,870	3,790	5,895	13,325
	15	145	270	435	580	830	1,450	2,325	3,070	4,770	10,790
25	10	195	360	580	775	1,110	1,950	3,110	4,110	6,385	14,430
	0-7	205	385	620	825	1,180	2,065	3,305	4,360	6,785	15,340
	20	155	290	470	630	900	1,575	2,520	3,330	5,175	11,700
30	15	220	410	665	890	1,270	2,220	3,555	4,700	7,300	16,510
	0-12	230	430	695	925	1,320	2,310	3,695	4,885	7,590	17,160
	30	155	290	470	630	900	1,575	2,520	3,330	5,175	11,700
40	25	250	470	755	1,010	1,440	2,520	4,030	5,330	8,280	18,720
	0-18	280	525	850	1,135	1,620	2,835	4,535	5,995	9,315	21,060
	40	190	355	575	770	1,100	1,925	3,080	4,070	6,325	14,300
50	30	315	585	955	1,275	1,820	3,185	5,095	6,735	10,465	23,660
	0-21	350	650	1,050	1,400	2,000	3,500	5,600	7,400	11,500	26,000
	45	280	520	840	1,120	1,600	2,800	4,480	5,920	9,200	20,800
60	35	360	670	1,080	1,440	2,060	3,605	5,770	7,620	11,845	26,780
	0-27	385	720	1,165	1,555	2,220	3,885	6,215	8,215	12,765	28,860
	60	280	525	850	1,135	1,620	2,835	4,535	5,995	9,315	21,060
75	50	415	775	1,250	1,665	2,380	4,165	6,665	8,800	13,685	30,940
	0-35	470	875	1,415	1,890	2,700	4,725	7,560	9,990	15,525	35,100
	70	290	540	870	1,160	1,660	2,905	4,650	6,140	9,545	21,580
85	50	490	915	1,480	1,965	2,820	4,935	7,895	10,435	16,215	36,660
	0-43	515	960	1,555	2,070	2,960	5,180	8,290	10,950	17,020	38,480
	80	370	690	1,115	1,485	2,120	3,710	5,935	7,845	12,190	27,560
100	60	580	1,080	1,740	2,325	3,320	5,810	9,295	12,285	19,090	43,160
	0-48	600	1,120	1,815	2,420	3,460	6,055	9,690	12,800	19,895	45,000
	100	440	825	1,335	1,780	2,540	4,445	7,110	9,400	14,600	33,000
125	80	680	1,275	2,060	2,745	3,920	6,860	10,975	14,500	22,540	50,960
	0-62	730	1,365	2,200	2,940	4,200	7,350	11,760	15,540	24,150	54,600
	125	490	910	1,470	1,960	2,800	4,900	7,840	10,360	16,100	36,400
150	100	800	1,490	2,400	3,205	4,580	8,015	12,825	16,945	26,335	59,540
	0-76	860	1,600	2,590	3,460	4,940	8,645	13,830	18,280	28,400	64,220
	150	490	915	1,480	1,975	2,820	4,935	7,895	10,435	16,125	36,660
175	125	870	1,630	2,635	3,515	5,020	8,785	14,055	18,570	28,865	65,260
	0-87	985	1,840	2,970	3,960	5,660	9,900	15,850	20,950	32,545	73,580
	150	840	1,600	2,540	3,390	4,840	8,470	13,550	17,900	27,830	65,920
200	125	1,075	2,000	3,240	4,330	6,180	10,815	17,300	22,870	35,530	80,340
	0-103	1,125	2,100	3,390	4,520	6,460	11,300	18,000	23,900	37,145	83,980
	175	840	1,650	2,670	3,560	5,080	8,890	14,225	18,800	29,210	66,000
225	150	1,160	2,180	3,500	4,660	6,660	11,655	18,650	24,640	38,300	86,600
	0-117	1,250	2,340	3,780	5,000	7,200	12,600	20,160	26,640	41,400	93,600
	200	925	1,730	2,790	3,720	5,320	9,300	14,900	19,680	30,600	69,200
250	150	1,340	2,500	4,050	5,400	7,720	13,500	21,600	28,600	44,400	100,360
	0-131	1,385	2,590	4,180	5,570	7,960	13,930	22,300	29,450	45,800	103,500
	225	880	1,640	2,650	3,530	5,050	8,830	14,130	18,670	29,000	
*273	200	1,240	2,320	3,750	4,990	7,130	12,480	19,960	26,400	41,000	
	0-145	1,510	2,830	4,570	6,090	8,700	15,230	24,360	32,200	50,000	
	250	920	1,720	2,780	3,700	5,290	9,250	14,800	19,600	30,400	
*300	225	1,250	2,330	3,770	5,020	7,170	12,550	20,100	26,500	41,300	
	0-160	1,640	3,070	4,960	6,600	9,440	16,520	26,400	34,900	54,300	

*Capcaities are based on an accuracy regulation of 1 PSI and with pipe sizes to insure reasonable velocities. Refer to pipe sizing chart. * Cast steel construction required for service above 250 psig*

Local regulation may restrict the use of this product below the conditions quoted. Limiting conditions refer to standard connections only.

In the interests of development and improvement of the product, we reserve the right to change the specification.

PAGES: H27-H40

return grilles

350 (RL / RS)

350 (ZRL / ZRS)

350 (FL / FS)

350 (ZFL / ZFS)

350 (RL-SS / RS-SS)

355 (RL / RS)

355 (ZRL / ZRS)

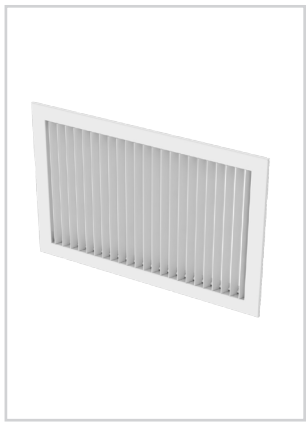
355 (FL / FS)

RETURN GRILLES

- Available in ¾" or ½" blade spacing
- 35°, 45° and 0° deflection models to choose from
- Available in steel, aluminum and stainless steel
- Blades parallel to the long or short dimension
- Finishes are either #26 white or #04 mill

355 (ZFL / ZFS)

350 (FL–FS / ZFL–ZFS)



350 (FL /FS)

350 (ZFL / ZFS)

350FL

- Great for areas with high humidity or subject to moisture
- ¾" blade spacing
- 35° fixed deflection
- Reinforced corners
- Blades parallel to the long dimension
- MRI compatible

350FS

- Same as 350FL with blades parallel to the short dimension

350ZFL

- Great for areas with high humidity or subject to moisture
- ¾" blade spacing
- 0° fixed deflection
- Reinforced corners
- Blades parallel to the long dimension
- MRI compatible

350ZFS

- Same as 350ZFL with front blades parallel to the short dimension

See website for Specifications

MODELS:

35° Deflection Models
350FL
350FS

0° Deflection Models
350ZFL
350ZFS

FINISH:

Standard Finish - #26 White

OVERVIEW

3/4" Blade Spacing / Aluminum

Titus' 300 / 350 Series return grilles define the standard for the industry. With high quality and competitive pricing these grilles form the back bone of a standard offering that will meet any application requirements.

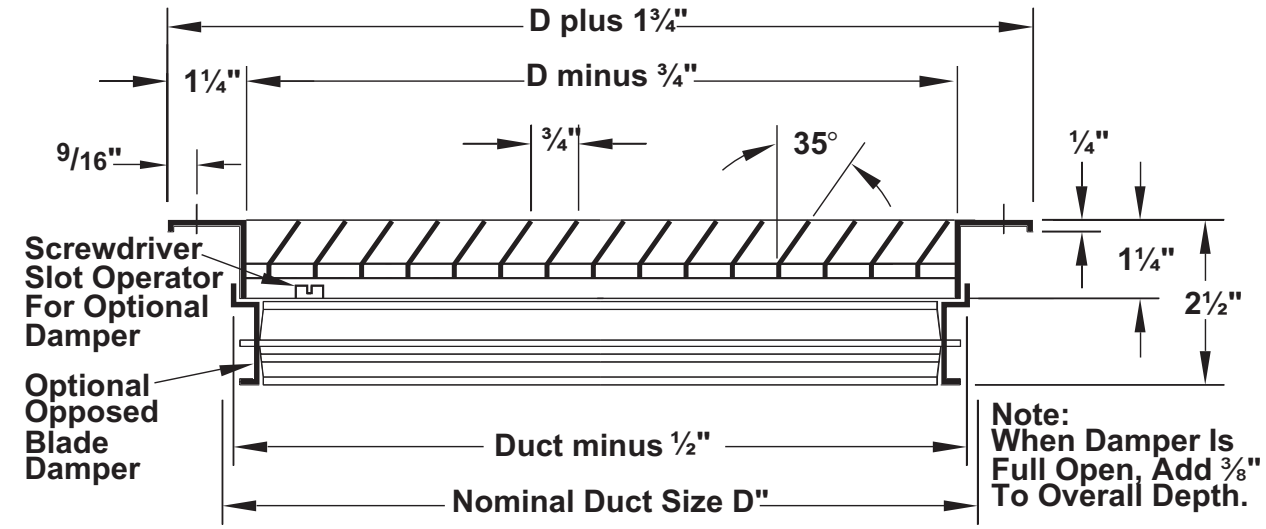
For Performance Data, refer to page H37 for 350R, and page H39 for 350ZR.

PRODUCTS INCLUDE

- Material: Roll-formed Aluminum Border and Blades on sizes up to 24 x 24 inches. Extruded Aluminum Border for Larger Sizes.
- Welded Border.
- Available Border Types:
  #1 - Surface Mount
  #2 - Snap-In
  #3 - Lay-In
  #4 - Spline
- Countersunk Screw Holes
- #8 x 1¼" Long Phillips Flat Head Sheet Metal Screws, Painted White
- Optional Steel or Aluminum Opposed-Blade Damper

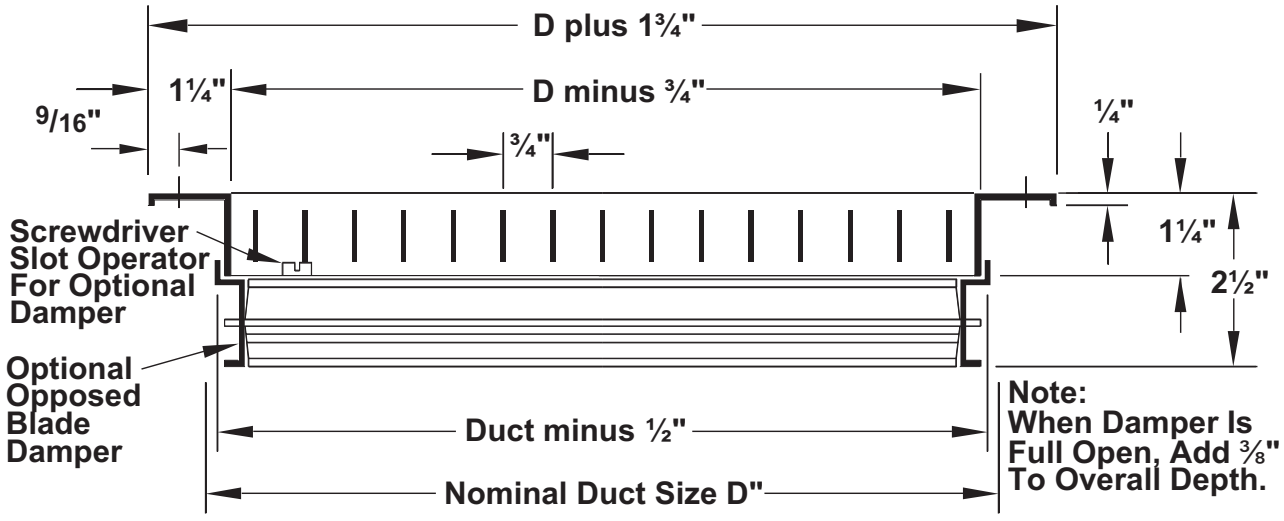
350 (FL-FS / ZFL-ZFS) DIMENSIONS

35° Deflection Models: 350FL / 350FS - Border Type 1



Available sizes (D" x D") are 6 x 4 inches through 48 x 48 inches in 1" increments
Odd and fractional sizes are available at additional cost

0° Deflection Models: 350ZFL / 350ZFS - Border Type 1



Available sizes (D" x D") are 6 x 4 inches through 48 x 48 inches in 1" increments
Odd and fractional sizes are available at additional cost

All dimensions are in inches

350 (RL-SS / RS-SS)

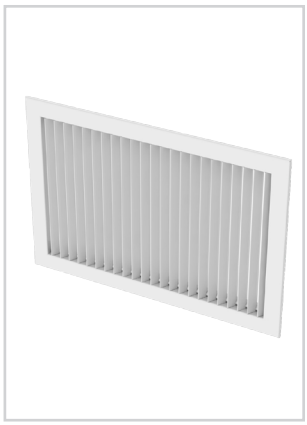
350RL-SS

- Great for use in corrosive environments
- ¾" blade spacing
- 45° fixed deflection
- Blades parallel to the long dimension
- Available in 316 Stainless Steel

350RS-SS

- Same as 350RL-SS with blades parallel to short dimension
- Tightly mitered corners
- Uniform polish finish
- Hollow airfoil blades anchored with nylon pivots for tight fit and no rattling
- Exclusive tooling and roll-forming equipment means metal is not contaminated with fragments of steel or aluminum

350 (RL-SS)



350 (RS-SS)

metric sizes

prevents corrosion

See website for Specifications

MODELS:

45° Deflection Models
350RL-SS
350RS-SS

FINISH:

Standard Finish - #04 Mill

OVERVIEW

3/4" Blade Spacing / Stainless Steel

Titus' 300 / 350 Series return grilles define the standard for the industry. With high quality and competitive pricing these grilles form the back bone of a standard offering that will meet any application requirements.

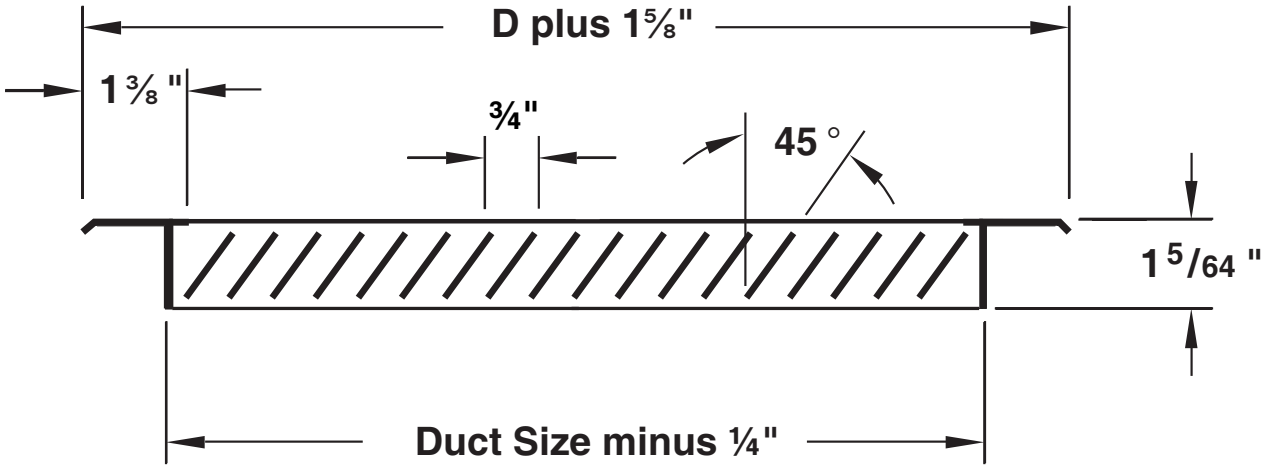
For Performance Data, refer to page H33.

PRODUCTS INCLUDE

- Material: 304 Stainless Steel Border and Blades.
- Available Border Types:
  #1 - Surface Mount
- Countersunk Screw Holes
- #8 x 1¼" Long 304 Stainless Steel Phillips Flat Head Sheet Metal Screws
- Optional 304 Stainless Steel Opposed-Blade Damper

350 (RL-SS / RS-SS) DIMENSIONS

45° Deflection Models: 350RL-SS / 350RS-SS - Border Type 1



Available sizes (D" x D") are 6 x 4 inches through 48 x 48 inches in 1" increments
Odd and fractional sizes are available at additional cost

STAINLESS STEEL MATERIAL PROPERTIES AND CHARACTERISTICS

TYPE 304 STAINLESS STEEL

Type 304, with its chromium-nickel content and low carbon, is the most versatile and widely used type of stainless steel. It possesses characteristics that provide resistance to oxidation and corrosion. Type 304 stainless steel provides good resistance to moderately acidic or caustic solutions.

TYPE 316 STAINLESS STEEL

Type 316 is a chromium-nickel stainless and heat resisting steel with superior corrosion resistance, as compared to other chromium-nickel steels, when exposed to many types of chemical corrosives such as sea water, brine solutions and the like. The addition of two percent molybdenum makes type 316 more resistant to corrosion and oxidation. Type 316 is considerably more resistant to solutions of sulfuric acid, chlorides, bromides and fatty acids at high temperatures. In the manufacture of pharmaceuticals, stainless steels containing molybdenum are required in order to avoid excessive metallic contamination.

STAINLESS STEEL APPLICATIONS

Stainless steel is the number one preferred material for those situations where corrosion, rusting or deterioration is a problem. However, that is just where the uses begin.

When a high-tech effect is desired in a restaurant, hotel or corporate lobby, nothing beats the clean lines and aesthetic beauty of stainless steel.

There are literally hundreds of additional applications, some include:

- Pharmaceutical Plants
- Food Processing Plants
- Showers and Locker Rooms
- Commercial Kitchens
- Wastewater Treatment Plants
- Bio-Medical Manufacturing
- Coastal Areas
- Industrial Applications
- Clean Rooms
- Laboratories
- Hospitals
- Dairy Facilities
- Beverage Plants
- Chemical Plants and Schools

All dimensions are in inches

355 (RL-RS / ZRL-ZRS)

355 (RL /RS)

355 (ZRL / ZRS)

355RL
- ½" blade spacing
- 35° fixed deflection
- Reinforced corners
- Blades parallel to the long dimension

355RS
- Same as 355RL with blades parallel to the short dimension

355ZRL
- ½" blade spacing
- 0° fixed deflection
- Reinforced corners
- Blades parallel to the long dimension

355ZRS
- Same as 355ZRL with front blades parallel to the short dimension

metric sizes

See website for Specifications

MODELS:

35° Deflection Models
355RL
355RS

0° Deflection Models
355ZRL
355ZRS

FINISH:

Standard Finish - #26 White

OVERVIEW

1/2" Blade Spacing / Steel

Titus' 300 / 350 Series return grilles define the standard for the industry. With high quality and competitive pricing these grilles form the back bone of a standard offering that will meet any application requirements.

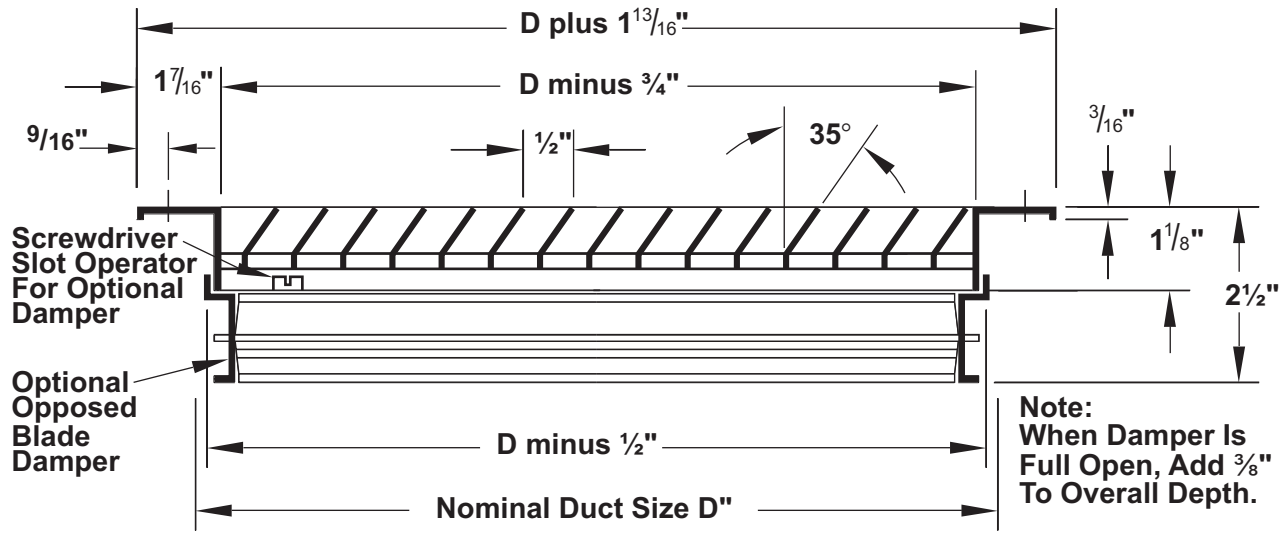
For Performance Data, refer to page H37 for 355R, and page H39 for 355ZR.

PRODUCTS INCLUDE

- Material: Roll-formed Steel Border and Blades
- Welded Border
- Available Border Types:
  #1 - Surface Mount
  #2 - Snap-In
  #3 - Lay-In
  #4 - Spline
- Countersunk Screw Holes
- #8 x 1¼" Long Phillips Flat Head Sheet Metal Screws, Painted White
- Optional Steel Opposed-Blade Damper

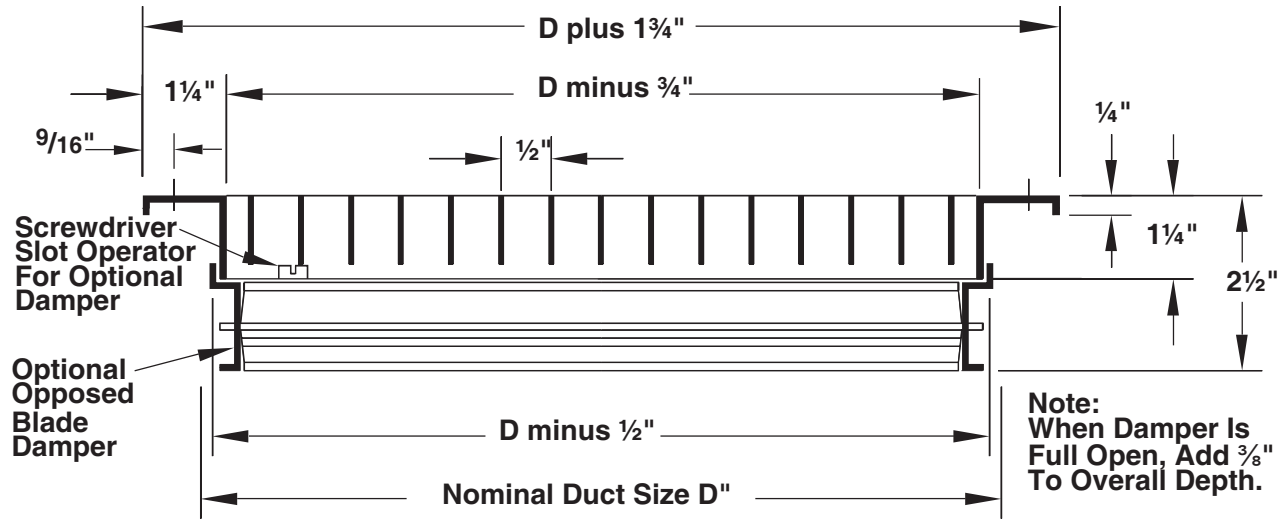
355 (RL-RS / ZRL-ZRS) DIMENSIONS

35° Deflection Models: 355RL / 355RS - Border Type 1



Available sizes (D" x D") are 6 x 4 inches through 48 x 48 inches in 1" increments
Odd and fractional sizes are available at additional cost

0° Deflection Models: 355ZRL / 355ZRS - Border Type 1



Available sizes (D" x D") are 6 x 4 inches through 48 x 48 inches in 1" increments
Odd and fractional sizes are available at additional cost

All dimensions are in inches

355 (FL–FS / ZFL–ZFS)

355FL
- Great for areas with high humidity or subject to moisture
- ½" blade spacing
- 35° fixed deflection
- Reinforced corners
- Blades parallel to the long dimension
- MRI compatible

355FS
- Same as 355FL with blades parallel to the short dimension

355ZFL
- Great for areas with high humidity or subject to moisture
- ½" blade spacing
- 0° fixed deflection
- Reinforced corners
- Blades parallel to the long dimension

355 (FL /FS)

355 (ZFL / ZFS)

- MRI compatible

355ZFS
- Same as 355ZFL with front blades parallel to the short dimension

metric sizes | humid areas | MRI compatible

See website for Specifications

MODELS:

35° Deflection Models
355FL
355FS

0° Deflection Models
355ZFL
355ZFS

FINISH:

Standard Finish - #26 White

OVERVIEW

1/2" Blade Spacing / Aluminum

Titus' 300 / 350 Series return grilles define the standard for the industry. With high quality and competitive pricing these grilles form the back bone of a standard offering that will meet any application requirements.

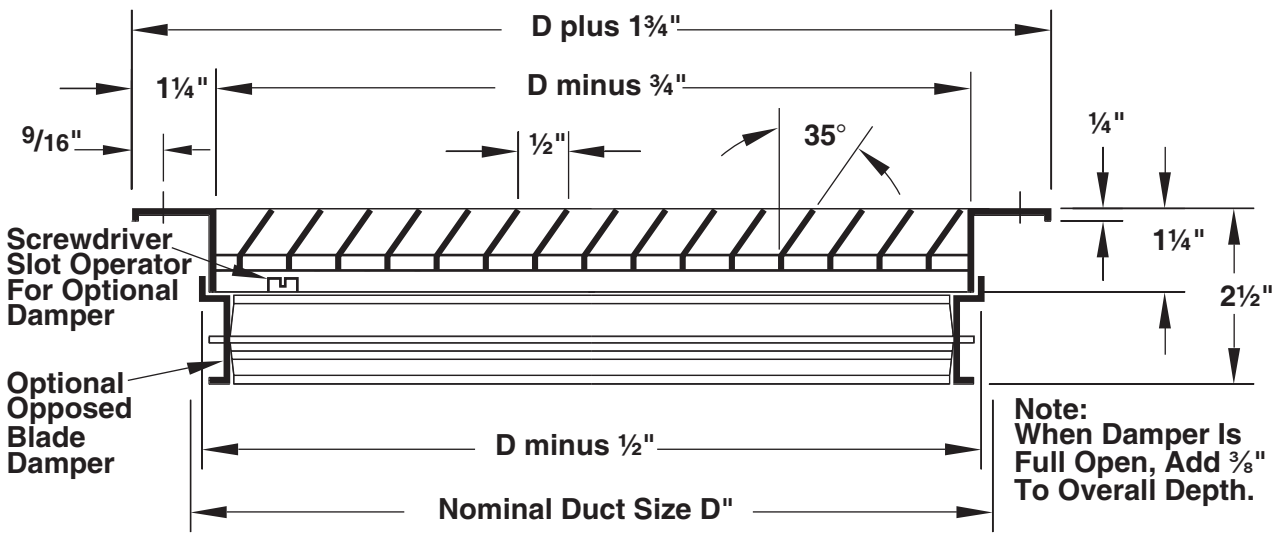
For Performance Data, refer to page H37 for 355R, and page H39 for 355ZR.

PRODUCTS INCLUDE

- Material: Roll-formed Aluminum Border and Blades on sizes up to 24 x 24 inches. Extruded Aluminum Border for Larger Sizes.
- Welded Border
- Available Border Types:
  #1 - Surface Mount
  #2 - Snap-In
  #3 - Lay-In
  #4 - Spline
- Countersunk Screw Holes
- #8 x 1¼" Long Phillips Flat Head Sheet Metal Screws, Painted White
- Optional Steel or Aluminum Opposed-Blade Damper

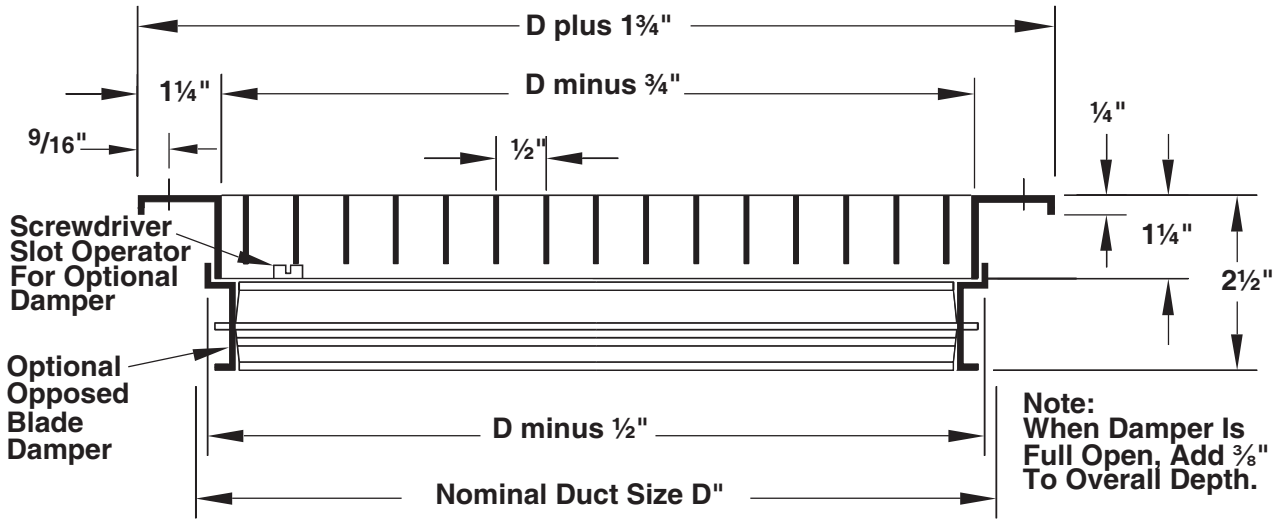
355 (FL-FS / ZFL-ZFS) DIMENSIONS

35° Deflection Models: 355FL / 355FS - Border Type 1



Available sizes (D" x D") are 6 x 4 inches through 48 x 48 inches in 1" increments
Odd and fractional sizes are available at additional cost

0° Deflection Models: 355ZFL / 355ZFS - Border Type 1



Available sizes (D" x D") are 6 x 4 inches through 48 x 48 inches in 1" increments
Odd and fractional sizes are available at additional cost

All dimensions are in inches

350R, 350F AND 350R-SS
PERFORMANCE BASED ON NOMINAL SIZES SHOWN IN BOLD

NC-20

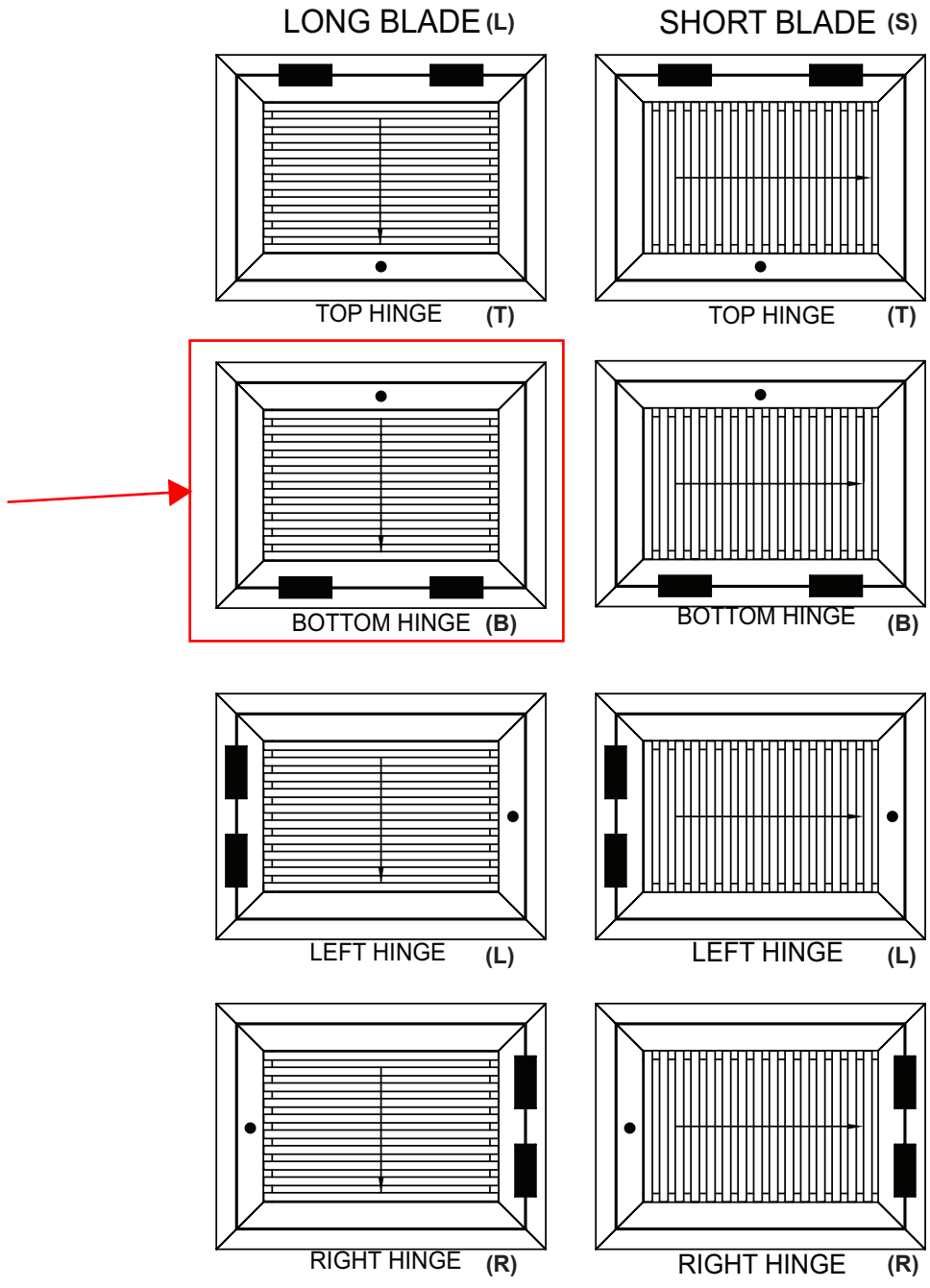
Nominal Duct Size (in.)	Nominal Duct Area (ft²)	Core Area (ft²)	Core Velocity Velocity Pressure Neg. Static Pressure	100 0.001 0.002	200 0.002 0.008	300 0.006 0.018	400 0.010 0.032	500 0.016 0.051	600 0.022 0.073	700 0.031 0.099	800 0.040 0.130	900 0.050 0.164
6x6	**0.25**	**0.19**	Airflow, cfm	19	38	57	76	95	114	133	152	171
			NC	-	-	-	-	-	13	19	25	29
8x6	**0.33**	**0.26**	Airflow, cfm	26	52	78	104	130	156	182	208	234
			NC	-	-	-	-	-	15	20	26	30
10x6	**0.42**	**0.34**	Airflow, cfm	34	68	102	136	170	204	238	272	306
			NC	-	-	-	-	-	16	21	28	32
8x8	**0.44**	**0.37**	Airflow, cfm	37	74	111	148	185	222	259	296	333
			NC	-	-	-	-	-	16	22	28	32
12x6	**0.5**	**0.41**	Airflow, cfm	41	82	123	164	205	246	287	328	369
			NC	-	-	-	-	-	17	22	30	34
14x6	**0.58**	**0.48**	Airflow, cfm	48	96	144	192	240	288	336	384	432
			NC	-	-	-	-	-	18	24	30	34
16x6 **12x8**	**0.67**	**0.57**	Airflow, cfm	57	114	171	228	285	342	399	456	513
			NC	-	-	-	-	10	19	25	30	35
10x10	**0.69**	**0.59**	Airflow, cfm	59	118	177	236	295	354	413	472	531
			NC	-	-	-	-	10	19	25	31	35
18x6	**0.75**	**0.63**	Airflow, cfm	63	126	189	252	315	378	441	504	567
			NC	-	-	-	-	10	19	25	32	35
20x6 **12x10**	**0.83**	**0.72**	Airflow, cfm	72	144	216	288	360	432	504	576	648
			NC	-	-	-	-	11	19	25	30	35
22x6	**0.92**	**0.77**	Airflow, cfm	77	154	231	308	385	462	539	616	693
			NC	-	-	-	-	11	19	25	30	35
24x6 **12x12**	**1**	**0.88**	Airflow, cfm	88	176	264	352	440	528	616	704	792
			NC	-	-	-	-	11	19	25	30	35
30x6 **18x10**	**1.25**	**1.11**	Airflow, cfm	111	222	333	444	555	666	777	888	999
			NC	-	-	-	-	12	20	26	32	35
14x14	**1.36**	**1.22**	Airflow, cfm	122	244	366	488	610	732	854	976	1098
			NC	-	-	-	-	12	20	27	32	35
36x6 **18x12**	**1.5**	**1.35**	Airflow, cfm	135	270	405	540	675	810	945	1080	1215
			NC	-	-	-	-	13	20	27	32	35
22x10	**1.53**	**1.37**	Airflow, cfm	137	274	411	548	685	822	959	1096	1233
			NC	-	-	-	-	13	20	27	32	36
30x8 **24x10**	**1.67**	**1.49**	Airflow, cfm	149	298	447	596	745	894	1043	1192	1341
			NC	-	-	-	-	14	21	27	33	37
42x6 **18x14**	**1.75**	**1.59**	Airflow, cfm	159	318	477	636	795	954	1113	1272	1431
			NC	-	-	-	-	14	21	27	33	37
16x16	**1.78**	**1.62**	Airflow, cfm	162	324	486	648	810	972	1134	1296	1458
			NC	-	-	-	-	14	21	27	33	37
24x12 18x16	**2**	**1.82**	Airflow, cfm	182	364	546	728	910	1092	1274	1456	1638
			NC	-	-	-	-	14	21	28	33	38
18x18	**2.25**	**2.07**	Airflow, cfm	207	414	621	828	1035	1242	1449	1656	1863
			NC	-	-	-	-	14	21	28	33	38
24x14	**2.33**	**2.14**	Airflow, cfm	214	428	642	856	1070	1284	1498	1712	1926
			NC	-	-	-	-	14	22	28	33	38
30x12	**2.5**	**2.29**	Airflow, cfm	229	458	687	916	1145	1374	1603	1832	2061
			NC	-	-	-	-	15	22	28	33	38
24x16	**2.67**	**2.46**	Airflow, cfm	246	492	738	984	1230	1476	1722	1968	2214
			NC	-	-	-	-	15	22	29	34	39
20x20	**2.78**	**2.57**	Airflow, cfm	257	514	771	1028	1285	1542	1799	2056	2313
			NC	-	-	-	-	16	23	29	34	39
36x12	**3**	**2.75**	Airflow, cfm	275	550	825	1100	1375	1650	1925	2200	2475
			NC	-	-	-	-	16	23	29	34	39
30x16 **24x20**	**3.33**	**3.11**	Airflow, cfm	311	622	933	1244	1555	1866	2177	2488	2799
			NC	-	-	-	-	17	24	30	35	40
22x22	**3.36**	**3.14**	Airflow, cfm	314	628	942	1256	1570	1884	2198	2512	2826
			NC	-	-	-	-	17	24	30	35	40
42x12 36x14	**3.5**	**3.22**	Airflow, cfm	322	644	966	1288	1610	1932	2254	2576	2898
			NC	-	-	-	-	17	24	30	36	40
24x22	**3.67**	**3.43**	Airflow, cfm	343	686	1029	1372	1715	2058	2401	2744	3087
			NC	-	-	-	-	17	24	30	36	40
30x18	**3.75**	**3.5**	Airflow, cfm	350	700	1050	1400	1750	2100	2450	2800	3150
			NC	-	-	-	-	17	24	30	36	40

NC-30

NC-40

- Static pressures are negative, in inches of water, measured per ANSI/ASHRAE Standard 70-2006
- NC based on room absorption of 10 dB, re 10^{-12} watts, measured per ANSI/ASHRAE Standard 70-2006

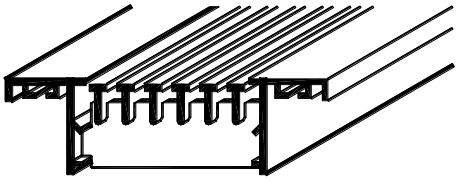
HINGE LOCATIONS



Linear Bar Diffusers
Aluminum • Fixed Bars • Pencil Proof

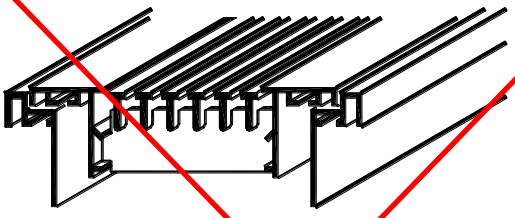
Models: CT-PP-0 • 7/16" Spacing • 7/32" Bars • 0° Deflection
CT-PP-3 • 7/16" Spacing • 7/32" Bars • 30° Deflection

Core with Border



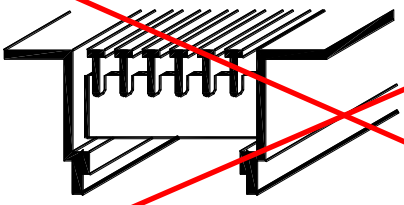
Type 13 border is shown. For other available types, please see next page.

Core with Frame & Border



Type 1A frame & border combination is shown. For other available types, please see next page.

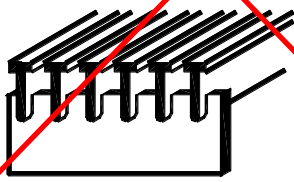
Core with Heavy Duty Mounting Frame for Floor Applications



Core is always furnished with Type H add'l reinforcing.

Type 5 heavy duty mounting frame is shown. For other available types, please see next page.

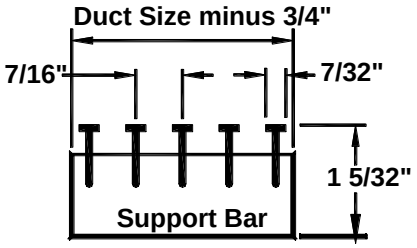
Core Only



Model CT-PP-0 core is shown. For other available models, please see below.

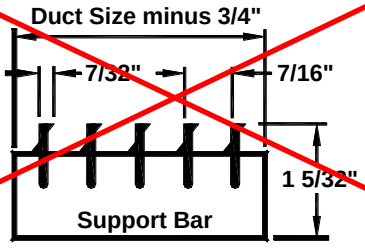
Available Cores Check ☑ if provided.

☐ Model CT-PP-0 • 0° Deflection



†

☐ Model CT-PP-3 • 30° Deflection



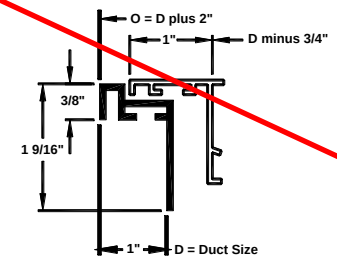
†

Note: † Not recommended for floor applications with heavy loads or high traffic.
If placing furniture on cores, furniture legs should be a minimum of core spacing plus two bars wide to avoid placing a horizontal load on core.

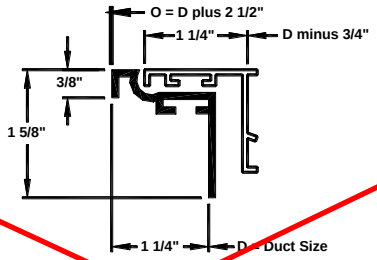
Frame & Border Types • Dimensions

Check ☑ if provided.

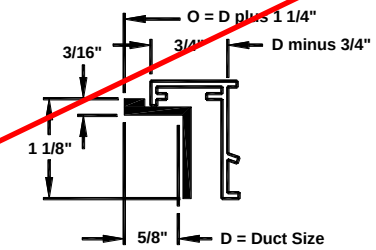
☐ Frame & Border Type 1A • 1" Border



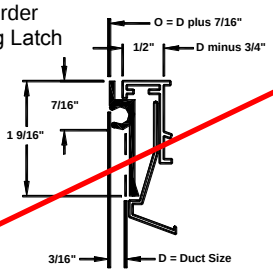
☐ Frame & Border Type 1B • 1 ¼" Border



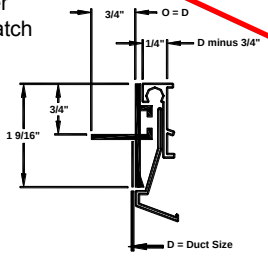
☐ Frame & Border Type 2 • ¾" Border



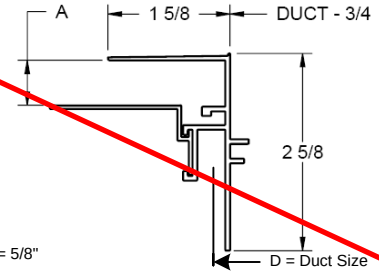
☐ Frame & Border Type 3
- ½" Border
- Spring Latch



☐ Frame & Border Type 4
- ¼" Border
- Spring Latch



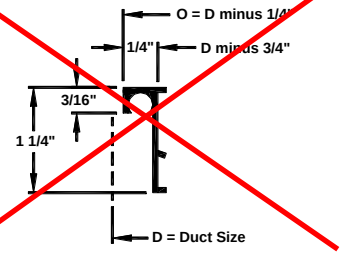
☐ Border Type 22 Tape & Spackle



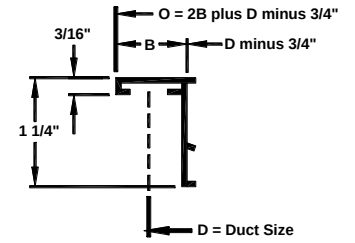
Border Types • Dimensions

Check ☑ if provided.

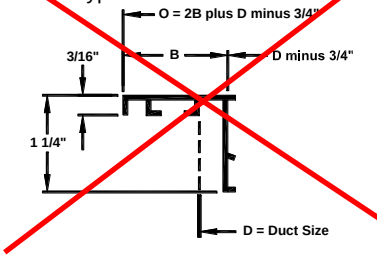
☐ Border Type 7 • ¼" Border



☐ Border Type 11 • ½" Border
☐ Border Type 12 • ¾" Border



☐ Border Type 13 • 1" Border
☐ Border Type 14 • 1 ¼" Border



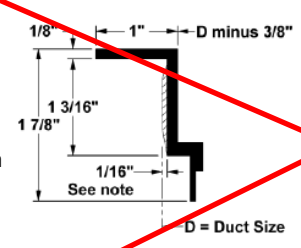
Heavy Duty Mounting Frames for Floor Applications

Check ☑ if provided.

(See submittal D-CT-HD for loading limitations.)

☐ Frame Type 5 • 1" Flange

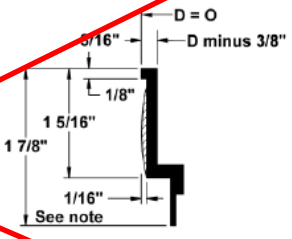
Note:
1/16" cut back accomodates weld beads on corners.



Removable core is furnished with frame. See front page for core selections. When spring clip is furnished, add an additional ¼" to duct width.

☐ Frame Type 6 • No Flange

Note:
1/16" cut back accomodates weld beads on corners.



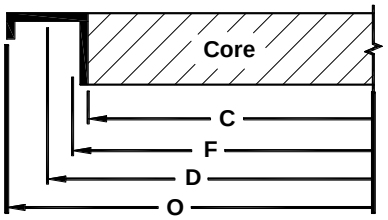
Removable core is furnished with frame. See front page for core selections. When spring clip is furnished, add an additional 1/4" to duct width.

Core Only (No Frame, No Border)

☐ Type CO

Overall Length and Widths for Various Frame & Border Types

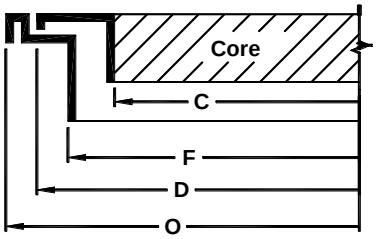
Border Types
(Type 11 shown)



Type	F Border Length	O Overall Length	C Core Opening Length
5	D	D plus 1 5/8	D minus 3/8
6	D	D	D minus 3/8
7	D minus 5/8	D minus ¼	D minus ¾
11	D minus 5/8	D plus ¼	D minus ¾
12	D minus 5/8	D plus ¾	D minus ¾
13	D minus 5/8	D plus 1 ¼	D minus ¾
14	D minus 5/8	D plus 1 ¾	D minus ¾
22	D minus 5/8	D plus 2 ½	D minus ¾

Dimensions are for length or width.

Frame & Border Types
(Type 1A & 1B shown)



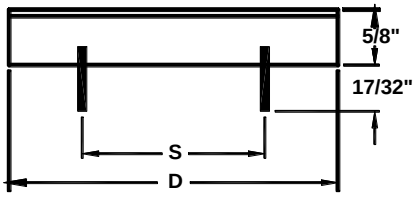
Type	F Border Length	O Overall Length	C Core Opening Length
1A	D	D plus 2	D minus ¾
1B	D	D plus 2 ½	D minus ¾
2	D	D plus 1 ¼	D minus ¾
3	D	D plus 7/16	D minus ¾
4	D	D	D minus ¾

Dimensions are for length or width.

Standard Core Width Information

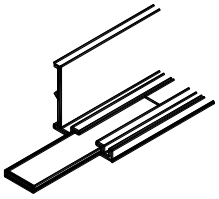
Duct Size D	¼" Spacing Core Opening C	¼" Spacing Number of Bars	½" or 7/16" Spacing Core Opening C	½" or 7/16" Spacing Number of Bars
2	1 ¼	3	1 ¼	2
2 ½	1 ¾	5	1 ¾	3
3	2 ¼	7	2 ¼	4
3 ½	2 ¾	9	2 ¾	5
4	3 ¼	11	3 ¼	6
5	4 ¼	15	4 ¼	8
6	5 ¼	19	5 ¼	10

Core Only



S=9" Maximum Support Bar Spacing. D=72" Maximum for One Piece. Core Only is an option available for field framing. Standard widths are as shown. Core will ship 3/4" smaller than the duct width.

Alignment Strips

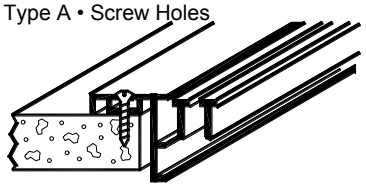


Used with border width 1/2" or wider. Alignment pins used with 1/4" borders.

Available Fastenings

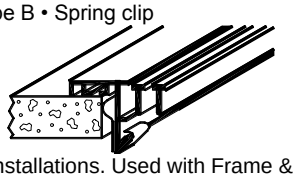
Check ☑ if provided.

☐ Type A • Screw Holes



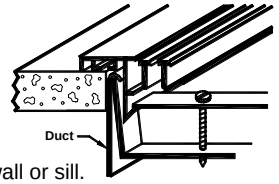
For ceiling, side wall or sill. Used with Frame & Border Types 1B, 5, 11, 12, 13, 14.

☐ Type B • Spring clip



For sill installations. Used with Frame & Border Types 7, 11, 12, 13, 14. Must use AG-35B instead of AG-35 with Type B fastening. Sill opening size must be slightly larger to accommodate spring clips.

☐ Type C • Concealed Fastening

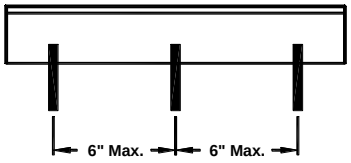


For ceiling, side wall or sill. Used with Frame & Border Types 1A, 1B, 2, 7, 11, 12, 13, 14, & Border Type 22

Additional Reinforcing (optional)

Check ☑ if provided.

☐ Type H • Optional Heavy Duty Core
• Standard with Heavy Duty Mounting Frame Types 5 and 6



Optional Heavy Duty Core has support bars on 6" maximum centers. (Standard core has 9" maximum centers.) See Submittal CT-HD for maximum loading.

All dimensions are in inches.

CT-PP-0 / 7/32" THICK BARS / 0° DEFLECTION / 7/16" SPACING WIDTH

Effective Area, Square Feet	Nominal Duct Width, Inches									
0.050	2	Total Pressure	0.013	0.03	0.053	0.084	0.12	0.164	0.214	0.271	0.334
		cfm per foot	20	30	40	50	60	70	80	90	100
		Noise Criteria (NC)	-	-	-	14	19	23	27	30	33
		Throw, Side Wall	3-5-11	5-8-16	7-11-18	9-13-20	11-16-22	12-17-24	14-18-26	16-19-27	17-20-29
0.072	2½	Total Pressure	0.013	0.03	0.053	0.084	0.12	0.164	0.214	0.271	0.334
		cfm per foot	28	42	56	70	84	98	112	126	140
		Noise Criteria (NC)	-	-	-	15	20	25	29	32	35
		Throw, Side Wall	3-6-12	6-9-19	8-12-22	10-15-24	12-19-26	14-20-28	16-22-30	19-23-32	20-24-34
0.094	3	Total Pressure	0.015	0.034	0.06	0.093	0.134	0.182	0.238	0.302	0.372
		cfm per foot	38	57	76	95	114	133	152	171	190
		Noise Criteria (NC)	-	-	12	18	23	27	31	35	38
		Throw, Side Wall	4-7-15	7-11-22	10-15-25	12-18-8	15-22-31	17-23-33	20-25-35	22-27-38	23-28-40
0.115	3½	Total Pressure	0.015	0.033	0.058	0.091	0.132	0.179	0.234	0.296	0.365
		cfm per foot	46	69	92	115	138	161	184	207	230
		Noise Criteria (NC)	-	-	12	19	24	28	32	35	38
		Throw, Side Wall	4-8-16	8-12-24	11-16-28	13-20-31	16-24-34	19-26-37	21-28-39	24-29-41	25-31-44
0.137	4	Total Pressure	0.014	0.032	0.058	0.09	0.13	0.177	0.231	0.292	0.36
		cfm per foot	54	81	108	135	162	189	216	243	270
		Noise Criteria (NC)	-	-	13	19	24	29	32	36	39
		Throw, Side Wall	4-9-17	9-13-26	12-17-30	14-22-33	17-26-37	20-28-40	23-30-42	26-32-45	27-33-47
0.180	5	Total Pressure	0.015	0.033	0.058	0.091	0.13	0.176	0.23	0.291	0.358
		cfm per foot	72	107	142	177	212	247	282	317	352
		Noise Criteria (NC)	-	-	14	20	26	30	34	37	40
		Throw, Side Wall	5-10-20	10-15-30	13-20-34	16-25-38	20-30-42	23-32-45	26-34-48	29-36-51	31-38-54
0.224	6	Total Pressure	0.011	0.028	0.054	0.088	0.131	0.182	0.241	0.309	0.385
		cfm per foot	75	122	169	216	263	310	357	404	451
		Noise Criteria (NC)	-	-	14	21	27	31	35	39	42
		Throw, Side Wall	4-9-19	10-15-31	14-21-37	18-27-42	22-33-47	26-36-51	30-38-54	33-41-58	35-43-61

CT-PP-3 / 7/32" THICK BARS / 30° DEFLECTION / 7/16" SPACING WIDTH

Effective Area, Square Feet	Nominal Duct Width, Inches									
0.048	2	Total Pressure	0.012	0.028	0.051	0.08	0.116	0.159	0.209	0.265	0.328
		cfm per foot	19	29	39	49	59	69	79	89	99
		Noise Criteria (NC)	-	-	16	22	28	32	36	39	43
		Throw, Side Wall	3-5-10	5-8-15	7-10-18	9-13-20	11-16-22	12-17-24	14-18-26	16-19-27	17-20-29
0.066	2½	Total Pressure	0.012	0.026	0.046	0.072	0.104	0.141	0.184	0.233	0.288
		cfm per foot	26	39	52	65	78	91	104	117	130
		Noise Criteria (NC)	-	-	16	22	27	32	36	39	42
		Throw, Side Wall	3-6-12	6-9-18	8-12-21	10-15-23	12-18-25	14-19-27	16-21-29	18-22-31	19-23-33
0.084	3	Total Pressure	0.011	0.026	0.046	0.073	0.105	0.144	0.188	0.238	0.295
		cfm per foot	33	50	67	84	101	118	135	152	169
		Noise Criteria (NC)	-	-	17	23	29	33	37	40	43
		Throw, Side Wall	3-7-13	7-10-20	9-14-24	11-17-26	14-20-29	16-22-31	18-24-33	20-25-35	22-26-37
0.102	3½	Total Pressure	0.011	0.025	0.044	0.069	0.099	0.135	0.177	0.224	0.276
		cfm per foot	40	60	80	100	120	140	160	180	200
		Noise Criteria (NC)	-	-	17	23	29	33	37	40	43
		Throw, Side Wall	4-7-15	7-11-22	10-15-26	12-19-29	15-22-32	17-24-34	20-26-36	22-27-39	23-29-41
0.120	4	Total Pressure	0.012	0.027	0.048	0.076	0.11	0.15	0.196	0.248	0.307
		cfm per foot	49	74	99	124	149	174	199	224	249
		Noise Criteria (NC)	-	-	19	25	31	35	39	42	45
		Throw, Side Wall	4-8-17	8-13-25	11-17-29	14-21-32	17-25-35	20-27-38	23-29-41	25-30-43	26-32-45
0.156	5	Total Pressure	0.011	0.026	0.047	0.073	0.106	0.144	0.188	0.238	0.294
		cfm per foot	63	95	127	159	191	223	255	287	319
		Noise Criteria (NC)	-	11	19	26	31	36	40	43	46
		Throw, Side Wall	5-9-19	9-14-28	13-19-32	16-24-36	19-28-40	22-30-43	25-32-46	28-34-49	30-36-51
0.192	6	Total Pressure	0.011	0.025	0.045	0.071	0.102	0.139	0.182	0.231	0.285
		cfm per foot	76	115	154	193	232	271	310	349	388
		Noise Criteria (NC)	-	11	20	26	32	36	40	43	46
		Throw, Side Wall	5-10-21	10-16-31	14-21-36	17-26-40	21-31-44	24-34-47	28-36-51	31-38-54	33-40-57

Performance notes appear at end of performance data