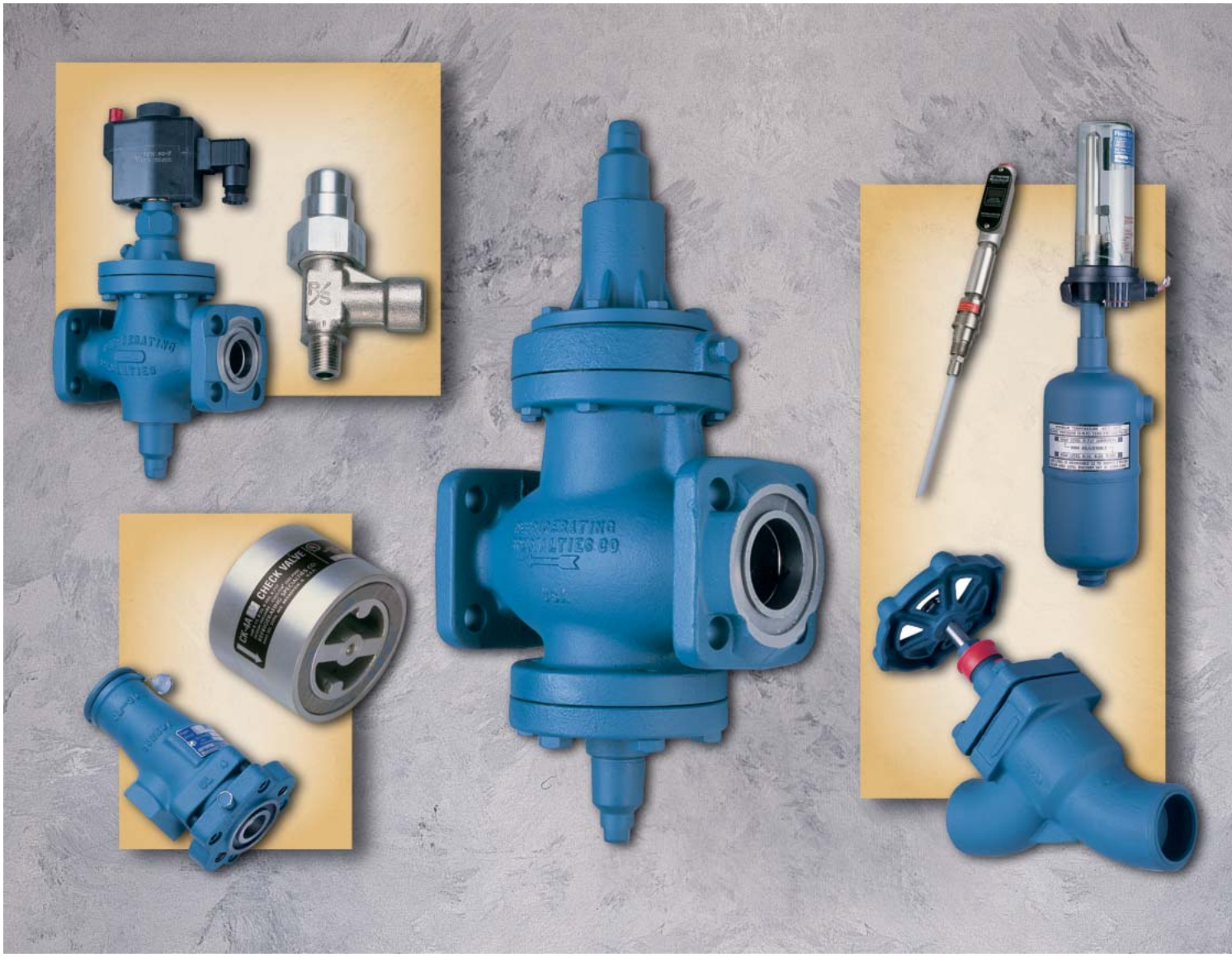
Parker
Climate & Industrial Controls

Industrial Refrigeration Control Valves

Catalog CC-12/US



Refrigerating Specialties Division

Based on over 75 years of experience in industrial refrigeration, the Refrigerating Specialties Division of Parker Hannifin Corporation has grown from an industry pioneer to a leading worldwide supplier of industrial refrigeration control valves. Our reputation for excellence in design engineering, manufacturing capabilities and quality performance has positioned us as a dominant force in the industrial refrigeration marketplace.

Parker Hannifin Corporation
ISO 9001 CERTIFIED
Parker
Refrigerating Specialties Division

Industrial Refrigeration Control Valves

Our comprehensive product line includes pressure regulators, refrigerant float switches, strainers, automatic flow regulators, solenoid valves, gas powered suction stop valves, check valves, safety relief valves and service valves for both ammonia and halocarbon refrigerants – all built to the highest quality standards recognized throughout the world for durability and reliability.

Product Engineering

Our experienced design and manufacturing engineering staff is backed by the technical expertise of Parker's Central Engineering Department, which specializes in advanced technologies. New designs are tested on highly sophisticated equipment.

Manufacturing

Our 62,000 square foot manufacturing plant is located in Mauston, Wisconsin. Advanced technology and state-of-the-art machining centers operated by employees dedicated to excellence produce the industry's finest, most dependable products. Products are inspected for precision and uniformity.

Quick Delivery

Finished product is available for immediate shipping from our Mauston plant. We are centrally located for shipping within the United States and close to major cities for international shipping. Our highly efficient shipping department works closely with our export personnel to provide global customers with the very finest delivery services.

Customer Service

Meeting customer's requirements is our highest priority. Our global network of representatives have decades of experience with refrigeration systems. Our inhouse service representatives are also highly-skilled and knowledgeable about product selection and application.

To contact us:

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Visit our web site www.parker.com/refspec

Pressure Regulators 3
A2A/A2B Small Capacity Regulators 4
A2CK Reseating Relief Regulators 6
A4 Adaptomode® Regulators 8
Variations 9
Low Pressure Drop Option 11
Flanged Body Regulators, 20-100mm (¾" - 4")
Basic Inlet Regulators 12
Basic Outlet Regulators 14
Differential & Pressure Compensated Regulators 16
Temperature Operated Regulators 18
Electrically Compensated Regulators 20
Electronic Pilot Operated 22
Weld End Body Regulators, 125-200mm (5" - 8") 24
Adaptomode® Modules 26
Accessories 29
Coil Information 30
Solenoid Valves 31
S6N 32
S8F 34
SV2 36
S7 38
S5 40
S4 Flanged Bodies, 20-100mm (¾" - 4") 42
S4 Weld End Bodies, 125-200mm (5" - 8") 44
Remote Pilot Light Assemblies 46
Coil Information 48
Gas Powered Valves 49
CK2 50
CK5 52
S9 Flanged Bodies, 50-100mm (2" - 4") 54
S9 Weld End Bodies, 125-200mm (5" - 8") 56
S9 Pilot Assembly 58
Check Valves 59
CK4 60
CK1 62
CK3 64
Safety Relief Valves 65
H Valves, M Manifolds 65
SR/SRH 68
Hand Valves 71
Liquid Flow Regulators 77
Adjustable Flow Regulators (AFR) 77
Fixed Flow Regulators (FFR) 78
Liquid Level Control 81
Programmable Liquid Level Controller (PLLC) 81
Depth Tracker Industrial Transducer Probes (ITP) 82
Refrigerant Float Switches (LL) 84
Rapid Purgers 86
Automatic Liquid Drainer (ALD) 88
Miscellaneous 89
Flanges, Union Kits, Adapter Rings 89
Strainers 92
Liquid Drain Ball Valves 95
Gauge Valves 96
Gauges 97
Liquid Pumps 98
Touch-Up Spray Paint 100
Warranty, Safe Operation, Factory Repair 101
Temperature/Pressure Charts 102
Offer of Sale 104

How to Use this Catalog

This catalog is organized by product group. For most sections, the first page is an overview. Specifications and selection guides given in table form provide comparison of the different valves and aid in selecting a specific product. Each type is then presented individually, giving additional information such as description, flows, materials of construction, dimensions and ordering information.

In order to bring Refrigerating Specialties model numbers into a format that will enable product ordering from the Parker online system, model coding has been developed for use with all of our product series.

Each character of a model number has significance. A model number can be built by selecting an option for each category in the model code and inserting the code given for that option into the model number. An example is shown at the top of every model code. With only a few exceptions, you must always enter something for each category, even if it only indicates that you do not want that option.

It is now possible to order flanges, coils, strainers, check valves, etc. with the valve within one model number. ***Be aware that you could build a model number that is not valid*** by selecting flange connections that do not apply to that size valve or voltages that cannot be provided on that style of coil, etc. Please use the reference tables to view the option limitations.

Our most commonly ordered options are offered in the catalog. However, there are many other possibilities. If you require something not shown in the catalog, please call us or send an e-mail to RSD_info@parker.com.

Reference CD

The CD enclosed at the back of the catalog contains all of our product bulletins, which give additional information on installation, service and parts. Bulletins are indexed both by document number and by product type. Capacity tables for R-717 and R-22 are also provided for most of our products.

The CD is self-loading and will install Adobe Acrobat Reader on your computer if you do not already have it.

New Products

Products appearing in our catalog for the first time are:

- A2CK reseating relief regulator
- CK5 gas powered suction stop valves
- Hand valves with extended bonnets
- PLLC programmable controller and *DepthTracker* transducer probes
- Rapid purgers
- Gauge valves
- Liquid drain ball valves
- Compact class "H" coils
- Female flanges

Soon to be released are the new higher pressure SR/SRH safety relief valves and open and hermetic liquid pumps.

⚠ WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure, and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Offer of Sale

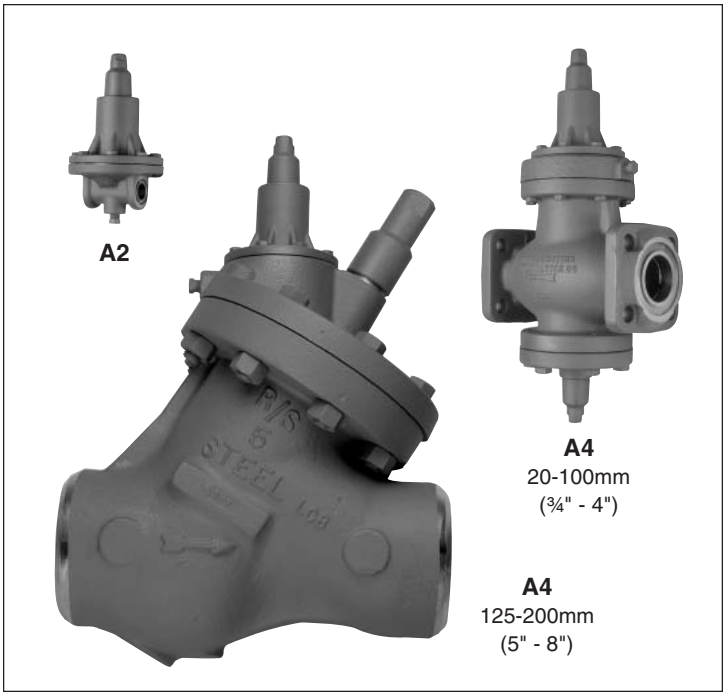
The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated in the full "Offer of Sale" at the end of this document.

Pressure Regulators

The Refrigerating Specialties family of pressure regulators includes valves that control inlet, outlet or differential pressure. Each regulator is available with an assortment of additional variations which enable one regulator to perform several functions.

The Type A2 are compact, small capacity regulators. The Type A4 are heavy-duty, high-flow regulators available in flanged body style in sizes 20-100mm (¾" - 4") and weld end body style in sizes 125-200mm (5" - 8"). The Adaptomode® system makes it possible to order the regulator and modules separately for stock or field conversion.

Gauge valves and gauges may be purchased with the regulator or separately (see pages 94-95).



Specifications

Type		A2A	A2B	A2CK	A4	A4	A4
Port Size	mm				20-32	40-100	125-200
	inch				¾" - 1¼"	1⅝" - 4"	5" - 8"
Seat					Metal-to-Metal (PTFE on A4K)	Lapped Metal-to-Metal	Lapped Metal-to-Metal
Pilot Seat		Stainless Steel Lapped Metal-to-Metal	Stainless Steel Lapped Metal-to-Metal	Stainless Steel Lapped Metal-to-Metal	Stainless Steel Lapped Metal-to-Metal	Stainless Steel Lapped Metal-to-Metal	Stainless Steel Lapped Metal-to-Metal
Body Material		Gray Iron	Gray Iron	Gray Iron	Gray Iron	Gray Iron	Cast Steel
Body Connection		Flanged	Flanged	Flanged	Flanged	Flanged	Weld End
Flow	Kv	1.28	0.43 (Inlet)		6.2 - 15	28.6 - 116	171 - 471
	Cv	1.5	0.5		7.2 - 17.5	33.4 - 135	200 - 550
Fluid Temperature	°C	-45° to 105°	-45° to 105°	-45° to 105°	-45° to 105°	-50° to 105°	-50° to 105°
	°F	-50° to 220	-50° to 220°	-50° to 220°	-50° to 220°	-60° to 220°	-60° to 220°
Operation		Direct Diaphragm	Direct Diaphragm	Direct Diaphragm	Pilot	Pilot	Pilot
Bulletin for Reference		21-02	21-02	21-03	See Page 11	See Page 11	23-20

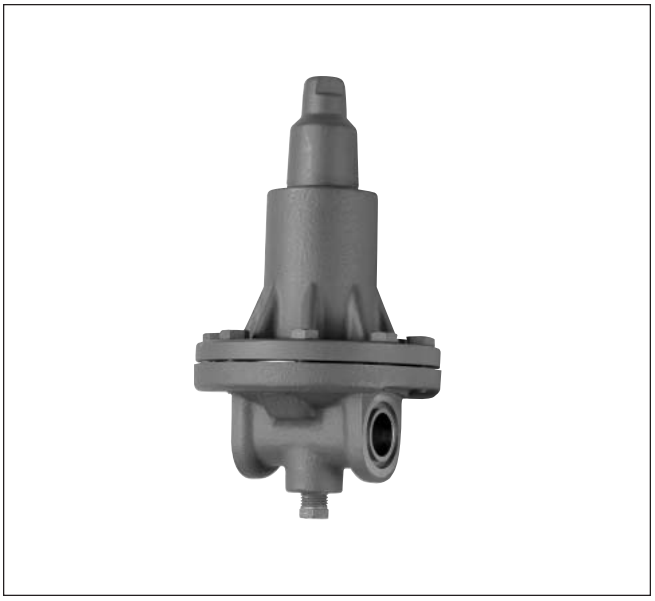
Pressure Setting Ranges

Code	Set Point Range	Approx. Pressure Change per Turn of Adjusting Screw	Factory Set Point (unless otherwise specified)
A	0 - 10.3 bar (0 - 150 PSIG)	1.7 bar (25 PSI)	2.8 bar (40 PSIG)
V	500mm Hg to 8.3 bar (20" Hg to 120 PSIG)	1.7 bar (25 PSI)	1.0 bar (15 PSIG)
D	5.2 to 19.3 bar (75 to 280 PSIG)	3.7 bar (53 PSI)	9.7 bar (140 PSIG)

*For variations "K" and "BK", the set point is factory set and **sealed**. Standard set point for each range is shown in the table to the left. A custom setting may be specified by adding the set point in PSIG preceded by a "-" at the end of the model number, i.e. -90. Set point must be valid for the range selected.*

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

- Compact, direct diaphragm operated
- Maximum rated pressure (MRP): 27.6 bar (400 PSIG)
- Flanged connections: FPT, SW, WN, ODS
- Available with close coupled strainer
- Stainless steel diaphragm



Description

The A2 type pressure regulators are compact, direct diaphragm operated, for use with refrigerant liquid or vapor. The regulators can be used with ammonia, R-22, R-134a, R-404A, R-507, certain other refrigerants, oil and other approved fluids with similar pressure, temperature and corrosion characteristics. The regulators are for use in systems where a small inlet or outlet pressure regulator is needed.

Materials

Body ..... Gray iron
Seat ..... Chrome plated
Diaphragm ..... Stainless steel preformed

Specifications

Maximum Fluid Temperature ..... 105°C (220°F)
Minimum Fluid Temperature ..... -45°C (-50°F)
Design Pressure (MRP) ..... 27.6 bar (400 PSIG)

⚠ **WARNING!**
ODS flanges not suitable for use with ammonia.

Application Guide

Type	Function	Operation	Typical Applications
A2B	Control inlet pressure	Regulate at preset inlet pressure Field adjustable Open on rise in inlet pressure	1. Small capacity back pressure regulator 2. Small capacity defrost relief regulator
A2A	Inlet regulator, greater capacity		
A2BO	Control outlet pressure	Regulate at preset outlet pressure Field adjustable Open on drop in outlet pressure	1. Gas pressure reducing regulator 2. Liquid or oil pressure reducing regulator

Selection Guide

Type	Description	Ranges Available (Std. is Bold)	Connections Available Style: FPT, SW, WN	Flow Coefficient③	
				Kv	Cv
A2B	Small Capacity Back Pressure Regulator	V, **A,** D	¼", ⅜", ½", ¾"	0.43	0.5
A2BK①	Relief, Give pressure setting	**A,** D		0.34	0.4
A2BP	Differential Regulator for ext. connection	**A,** D		0.43	0.5
A2BM	Electrically Compensated	V, **A**, D			
A2BT	Temperature Operated Regulator	1, 2	¼", ⅜", ½", ¾"		
A2A	Small Capacity Back Pressure Regulator	**A,** D	¼", ⅜", ½", ¾"	1.28	1.5
A2BO1②	Small Capacity Outlet Pressure Regulator	**V,** D	¼", ⅜", ½", ¾"	0.09	0.1
A2BO2②				0.17	0.2
A2BO4②				0.43	0.5

① The A2BK Reseating Relief Regulator can be used for various relief to low side applications including cold liquid line sections where buildup of dangerous hydrostatic pressure is possible. See "Safe Operation".

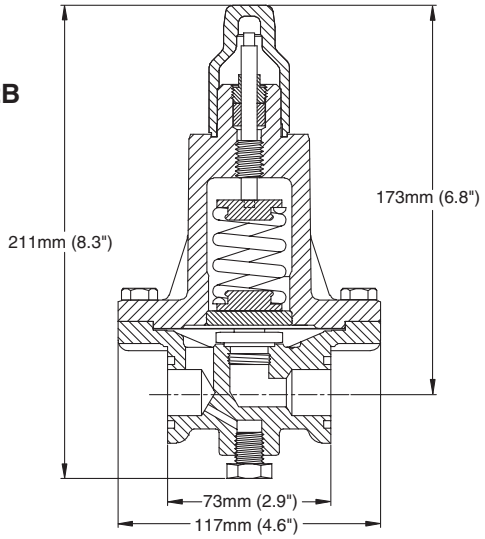
② For external pressure connection, specify A2BO1E, A2BO2E or A2BO4E.

③ Flow coefficients are for standard range.

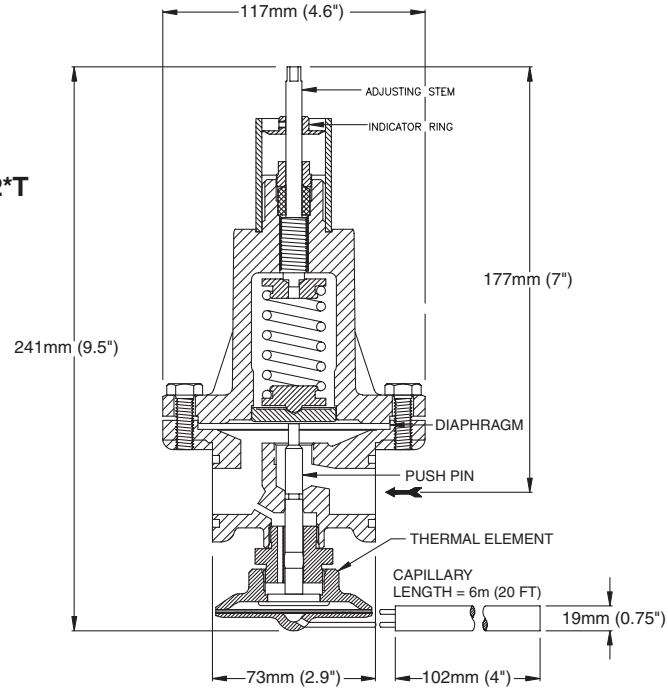
⚠ **CAUTION:**
When ordering a Type A2 regulator to be used as a pilot regulator for an A4R, the size of the A4R main regulator must be considered. For 20-50mm (¾" - 2") A4R, order an A2B2 or A2BO2E. For 65-200mm (2½" - 8") A4R, order an A2B or A2BO4E.

Dimensions

A2A, A2B



A2*T



How to Order Type A2 Regulators

Regulators can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Type	Variation	Range	Inlet Flange	Outlet Flange	Gauge	Gauge Valve	Strainer		Set Point
A2B	T	1	F03	F03	A2	A	S	–	

Type

A2A	Inlet, 1.28 Kv
A2B	Inlet, 0.43 Kv

Variations (see Note)

Blank	Inlet Regulator, No Variation
2	A2B Inlet Regulator, 0.17 Kv
E	External Pressure Connection
K	Reseating Relief
M*	Electrically Compensated (Select Motor)
P	1:1 Pneumatically (Pressure) Compensated
3P	3:1 Pneumatically (Pressure) Compensated
T	Temperature Operated
H	Inlet Regulator w/Handwheel
O1	Outlet, 0.09 Kv
O2	Outlet, 0.17 Kv
O4	Outlet, 0.43 Kv
O1E	Outlet External, 0.09 Kv
O2E	Outlet External, 0.17 Kv
O4E	Outlet External, 0.43 Kv

Note: Only "T" variation is available with A2A.

Flange Type / Size

Flange Type		Size	
X	No Flange	**00**	None
F	FPT (IPS)	**02***	¼"
S	SW (IPS)	**03**	⅜"
W	WN (IPS)	**04**	½"
		06	¾"
K	ODS	**04**	½"
		05	⅝"
		07	⅞"
D	DIN Weld Neck	**10**	10mm
		15	15mm
		20	20mm

* FPT only.

Body

N	No Valve
A	1/4" Angle

Strainer

N	No Strainer
S	w/Strainer

Custom Set Point (Var. "K" Only)

Setting in PSIG within the values for the range selected

Pressure Range*

A	0 to 10.3 Bar (0 to 150 PSIG)
D	5.2 to 19.3 Bar (75 to 280 PSIG)
V	500mm Hg to 8.3 Bar (20" Hg to 120 PSIG)

Temperature Range ("T" Variation only)

1	-30° to +30°C (-20° to +80°F)
2	+20° to +60°C (60° to 140°F)

* See Selection Guide table for pressure range availability. Not available with "T" variation.

Gauge Size, Range, Type

N	No Gauge
A	2½" English, Low Pressure
B	3½" English, Low Pressure
C	2½" English, High Pressure
D	3½" English, High Pressure
E	2½" Metric, Low Pressure
F	3½" Metric, Low Pressure
G	2½" Metric, High Pressure
H	3½" Metric, High Pressure

Refrigerant

0	No Gauge
7	R-717
1	R-134a
2	R-22
4	R-404A
5	R-507

***Motor Style ("M" Variation Only)**

H	Motor Hardware Only
	Honeywell Motors
1	24V 50/60Hz Std. Cam w/120V transformer
A	24V 50/60Hz Std, Cam w/240V transformer
2	24V 50/60Hz Low Rise Cam w/120V transformer
B	24V 50/60Hz Low Rise Cam w/240V transformer
3	4-20 mA, 120V 50/60Hz, Standard Cam
4	4-20 mA, 120V 50/60Hz, Low Rise Cam
5	4-20 mA, 240V 50/60Hz, Standard Cam
6	220V 50Hz Std. Cam
7	220V 50Hz Low Rise Cam

***Motor Style, Continued ("M" Variation only)**

	Penn Motors
8	24V 50/60Hz Std. Cam w/120V transformer
C	24V 50/60Hz Std. Cam w/240V transformer
9	24V 50/60Hz Low Rise Cam w/120V transformer
D	24V 50/60Hz Low Rise Camw/240V transformer

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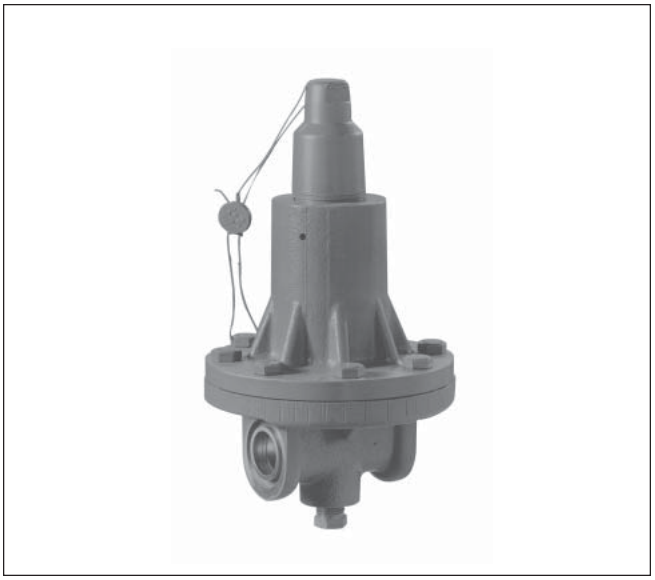
- Compact, direct diaphragm operated
- Maximum rated pressure (MRP): 27.6 bar (400 PSIG)
- Flanged connections: FPT, SW, WN, ODS
- Available with close coupled strainer



Description

The A2CK pressure relief regulator is direct diaphragm operated, for use with refrigerant liquid or vapor. The regulators can be used with ammonia, R-22, R-134a, R-507 and other common refrigerants. This regulator is used in systems where a small direct operated valve is required as a safety device to relieve “trapped” liquid lines in the event that a hydrostatic pressure condition develops. *The A2CK should not be piped or applied as ASME certified safety relief valve for use on pressure vessels.*

The A2CK utilizes a special pilot seat designed to provide for a higher flow rate (Cv) than the A2BK relief regulator. Additionally, with a relatively small ratio of diaphragm to pilot seat area, it is designed to open and regulate refrigerant flow quickly through the pilot seat once its set point has been reached. The design of the valve allows for this "quick release" feature. However, it does not offer the same type of controlled response which may be required for a standard regulator application. For those applications where a small regulator is needed for accurate upstream pressure control, an A2A or A2B direct operated regulator should be considered.

The A2CK is factory set and sealed with a lead seal prior to shipment. Since the valve should be used exclusively as a small internal relief valve, it is designed with the “D” range adjusting spring only. Set points must fall in the 75 to 280 PSIG (5 to 19 bar) range.

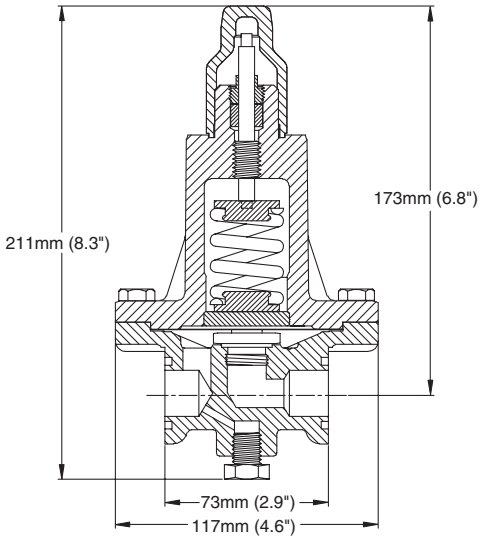
Materials

Body Material	Gray iron
Seat Material	Stainless steel
Diaphragm Material	Stainless steel

Specifications

Maximum Fluid Temperature	105°C (220°F)
Minimum Fluid Temperature	-45°C (-50°F)
Design Pressure (MRP)	27.6 bar (400 PSIG)
Flow Coefficient	1.14 Cv

Dimensions



How to Order A2CK Compact Relief Regulators

Regulators can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Type	Variation	Range	Inlet Flange	Outlet Flange	Gauge	Gauge Valve	Strainer		Set Point
A2C	K	D	F03	F03	C1	A	S	–	125

Variation

K	Reseating Relief Regulator

Range

D	5.2-19.3 Bar (75-280 PSIG)

Flange Type / Size

Flange Type		Size	
X	No Flange	00	None
F	FPT (IPS)	02*	¼"
S	SW (IPS)	03	⅜"
W	WN (IPS)	04	½"
		06	¾"
K	ODS	04	½"
		05	⅝"
		07	⅞"
D	DIN Weld Neck	10	10mm
		15	15mm
		20	20mm

* FPT only.

Gauge Size, Range, Type

N	No Gauge
A	2½" English, Low Pressure
B	3½" English, Low Pressure
C	2½" English, High Pressure
D	3½" English, High Pressure
E	2½" Metric, Low Pressure
F	3½" Metric, Low Pressure
G	2½" Metric, High Pressure
H	3½" Metric, High Prsesure

Refrigerant

0	None
7	R-717
1	R-134a
2	R-22
4	R-404A
5	R-507

Body

N	No Valve
A	1/4" Angle

Strainer

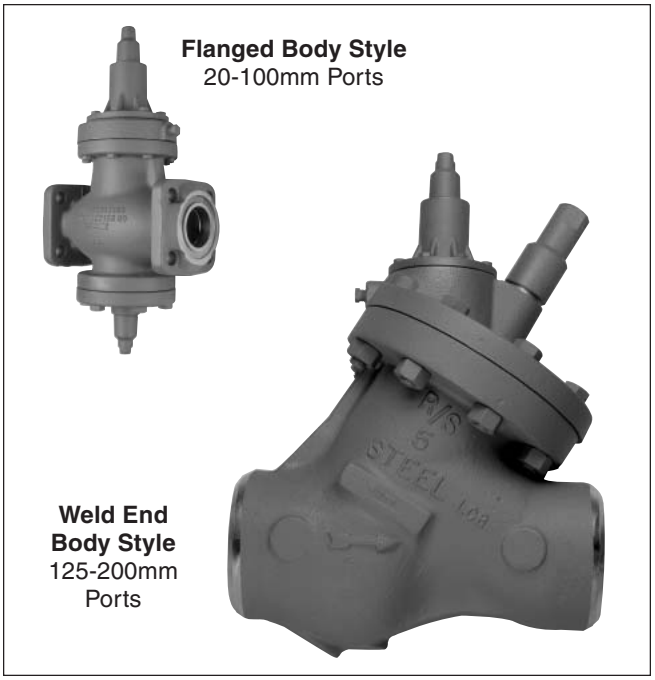
N	No Strainer
S	w/Strainer

Custom Set Point

xxx	Setting in PSIG between 75 and 280. Standard factory setting is 140.

⚠ WARNING!
ODS flanges not suitable for use with ammonia.

- Pilot operated for precise control
- Characterized modulating plug for stable control under low flow conditions
- Many control variations are possible
- Convertible to other variations
- Optional close coupled strainers up to 100mm (4")
- Manual opening stem
- Easy to service



Description

These compact, heavy-duty, pilot-operated regulators are suitable for use with Ammonia, R-22, R-134a, R-404A, R-507 and other common refrigerants and fluids approved for use in refrigeration systems.

The A4 family of regulators includes valves that control inlet, outlet or differential pressure. Each regulator is available with an assortment of additional variations which enable one regulator to perform several functions. The most common arrangements are shown on pages 9-11.

Port sizes 20-100mm (3/4" to 4") are flanged body valves. Port sizes 125 -200mm (5" - 8") are weld end body valves.

Ordering Tips

A4 regulators with variations are normally ordered factory assembled and tested. However, the A4Z regulators and the Adaptomode® modules shown on pages 26-28 are available separately for stock or field conversions.

Flanges are generally ordered with the regulator and are specified as part of the model number. Male flanges are provided for both inlet and outlet. Flanges may also be ordered separately from pages 87-89.

The A4R regulators are available for remote pilot operation. The pilot regulator (A2B) and pilot solenoid must be ordered separately.

Variations B, S and D, alone or in combination with other variations, require a selection of voltage, coil and pilot light. For variations with two solenoids, each selection applies to both. Not all voltages are available for each type of coil and/ or pilot light. Refer to the table on page 30 for availability. For other variations, enter "0" into those fields of the model code.

A4 regulators are generally ordered with an upstream strainer to prevent entrance of foreign materials into the valve and the rest of the system.

Back flow through these regulators will occur when outlet pressure exceeds inlet pressure by several PSI. To avoid backflow under these conditions, order the check valve option to install downstream of the regulator.

Regulators will be set to standard set points for the selected range (see page 3). For variations "K" and "BK", a custom setting can be indicated at the end of the model number by adding the value in PSI preceded by a "-", i.e. -100. For Range V, indicate PSI as above, or inches Hg by adding the setting in inches preceded by "-Hg", i.e. -Hg10.

Materials

Body:

20-100mm ..... Gray Iron (ASTM A126 Class B)
125-100mm ..... Cast Steel (A-352 GR, LCB)

Seat ..... Lapped Metal to Metal
except A4K 20-32mm (¾" to 1¼") ..... PTFE

Pilot Seat ..... Stainless Steel

Diaphragm ..... Stainless Steel, Preformed

Specifications

Maximum Fluid Temperature ..... 105°C (220°F)

Minimum Fluid Temperature:
20-32mm (¾" to 1¼") ..... -45°C (-50°F)
40-200mm (1⅝" to 8") ..... -50°C (-60°F)

Design Pressure (MRP) ..... 27.6 bar (400 psig)

Flow Coefficients

Port Size	Flow Coefficient Kv (Cv)	Reduced Capacity Plugs		
		50% Kv (Cv)	35% Kv (Cv)	17% Kv (Cv)
20	6.2 (7.2)	3.1 (3.6)		1.0 (1.2)
25	8.6 (10.0)			
32	15.0 (17.5)		5.2 (6.1)	
40	28.6 (33.4)		10.0 (11.7)	
50	42.4 (49.5)			
65	60.0 (70.0)		21.0 (24.5)	
75	86.0 (100.0)		30.0 (35.0)	
100	116.0 (135.0)		41.0 (48.0)	
125	171.0 (200.0)			
150	308.0 (360.0)			
200	471.0 (550.0)			

Application Guide

There are many possible combinations of A4 regulator variations. The electric shut-off (S), electric wide-opening (B) and dual pressure (D) variations are often combined with each other. Or they may be used in combination with the compensated (M, P, 3P and T), outlet pressure (O) or differential pressure (L) regulators. Remote configurations of most variations are available using the A4R regulator separate from pilot controls.

Variation	Type Suffix	Type	Function	Operation	Typical Applications
Basic regulator	—	A4	Control inlet pressure	Operates at present inlet pressure. Can be field adjusted. Opens on rising inlet pressure.	1. Evaporator pressure control 2. Condenser pressure control 3. Any inlet pressure control
Electric shut-off	S	A4S	Control inlet pressure or shut off regulator	Regulates when electrically energized; closed when not energized.	1. Open for temperature control 2. Closed for defrosting
Electric wide opening	B	A4B	Control inlet pressure or wide open regulator	Regulates when not electrically energized; wide open when energized.	1. Wide open for maximum cooling 2. Regulating for defrost 3. Regulating for temperature control.
Dual Pressure	D	A4D	Dual pressure control	Regulates at lower pressure when electrically energized; at higher pressure when not energized.	1. Higher pressure for defrost 2. Higher pressure for temperature control. 3. Internal pressure relief.
Reseating relief	K	A4K	Reseating relief regulator	Open wide above set point. Repeatedly reseats after operation.	1. Defrost relief 2. Non-atmospheric relief 3. High to low relief
Outlet pressure regulator	O	A4O A4OE	Control outlet pressure	Regulates at preset outlet pressure.Can be field adjusted. Opens on a drop in outlet pressure.	1. Crankcase pressure regulation 2. Hot gas bypass; booster loading 3. Receiver pressure control
Differential pressure regulator	L	A4L	Control pressure difference across regulator	Regulates pressure difference at or below a pre-set amount.	1. Liquid pump relief regulator 2. Reduce liquid or vapor line pressure
Electrically compensated	M	A4M	Motor changes pressure set-point	Potentiometer or solid state type thermostat readjusts set-point to match evaporator temperature to a varying load.	1. Precise control of process cooling 2. Liquid chillers 3. For load change compensation
Pneumatically compensated	P, 3P	A4P A43P	Air pressure changes set-point (1:1 ratio); A4A3P for 3:1 ratio	Pneumatic thermostat readjusts set-point to match evaporator temperature to a varying load.	1. Precise control of process cooling 2. Liquid chillers 3. For load change compensation
Temperature operated	T	A4T A4OT A4OTE	Temperature bulb controls regulator opening	Increase in temperature opens regulator; decrease in temperature closes regulator. Also reverse acting with “O” variation.	1. Process cooling systems 2. Liquid chillers 3. Systems with load change 4. Heat reclaim
Electronic pilot operated	J	A4J	Electronic signal controls regulator opening	Pilot position is proportional to electronic signal.	1. Precise control 2. Liquid chiller 3. System with load change
Externally equalized	E	A4E A4OE etc.	Control at external pressure sensed remote from valve	Same as standard regulator except controlled pressure is sensed away from regulator.	1. Low Pressure drop (A4AE) 2. Hot gas bypass (A4AOE)
Main regulator for remote pilot	R	A4R	Main regulator is controlled by separate pilots	Main regulator modulates, closes or opens in response to remote pilots.	1. Simple inventory of regulator and pilots 2. Convenient placement of pilots 3. Unusual pilots or circuits
Basic regulator assembly	Z	A4Z	Complete regulator assembly to which modules can be added.	Can be built into most of the A4A variation regulators. Has a Modudapter® and two Moduplates®.	Versatile unit for inventory along with Modules on pages 20-22.

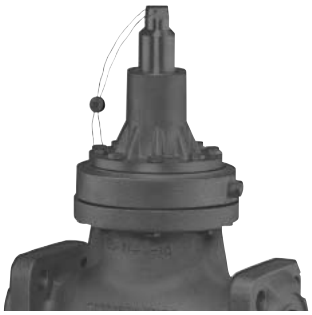
The most common variations of the Type A4 regulator appear on the following pages. For other combinations, please consult factory.

A4
Basic Inlet

A4O
Basic Outlet

A4L
Differential Pressure

A4Z
Inlet with Modudapter®



A4K
Relief

A4P
Pressure Compensated

A4B
Electric Wide Opening

A4S
Electric Shut-Off

A4D
Dual Pressure

A4JS
Electronic Pilot Operated

A4M
Electrically Compensated

A4OT
Temperature Operated

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Refrigerating Specialties Division
Broadview, IL 60155 USA

Regulator Variations

Added Variation	Code	Catalog Pages*	Ordering Information Required						Bulletin Number
			Pressure Range(s)	Voltage, Coil	Pilot Light	Motor	Set Point	Temp. Range	
Electric Shut-Off	S	12-13	●	★	★				23-06
Electric Wide Opening	B	12-13	●	★	★				23-06
Dual Pressure Regulator	D	12-13	●●	★	★				23-06
Reseating Relief Regulator	K[1]	12-13	●				●		23-05
Outlet Pressure Regulator	O	14-15	●						23-07
Differential Pressure Regulator	L[2]	16-17	●						23-10
Electrically Compensated	M[3]	20-21	●			●			23-11
1:1 Pneumatically Compensated	P	16-17	●						23-08
3:1 Pneumatically Compensated	3P	16-17	●						23-08
Temperature Operated	T	18-19						●	23-09
Electronic Pilot Operated	J[4]	22-23	●						23-12
Externally Equalized	E	12-13	●						23-05
Main Regulator for Remote Pilot	R	12-13							23-05
Complete Regulator Assembly w/ Modudapter® & 2 Moduplates®	Z[5]	12-13	●						23-06

* Page numbers reference information for flanged body regulators, 20-100mm (¾" to 4"). For weld end bodies, 125-200mm (5" - 8"), see pages 24-25.

★ See Table on Page 30 for available voltages for coils and pilot lights.

NOTES:

1 Factory set and tagged. Standard 4.9 bar (70 PSIG)

2 Determine range from pressure **difference** required

3 Thermostats available to order separately

4 Includes a Landis & Staefa M2FP03GX direct operated proportional solenoid as pilot valve. Order I/O module and controller within model number. Transformer may be ordered separately.

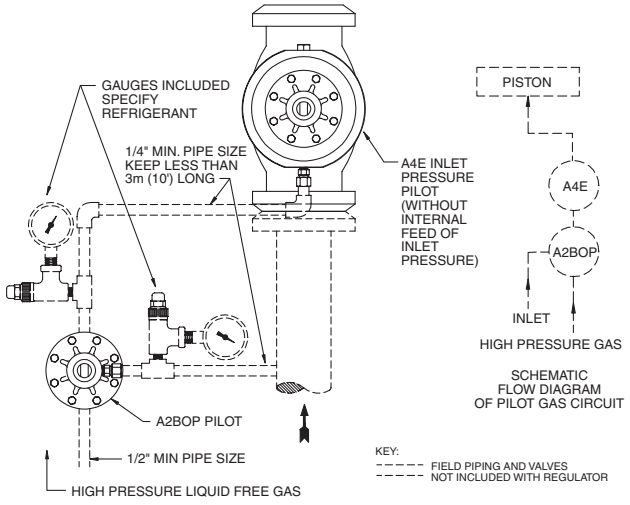
5 See pages 26-28 for Adaptomode modules sold separately.

Low Pressure Drop Option (LPD)

With the conventional evaporator regulator, a minimum of 2 PSI pressure across the main valve is required for the valve to be fully open. The Low Pressure Drop feature added to a Type A4 inlet or outlet pressure regulator permits full flow modulation with prsesure drops down to 1/2 PSI.

The principle of operation for the LPD is to provide high pressure refrigerant to the A2BOP pilot inlet line. Reduce this high pressure to a lower pressure and control it to follow the main regulator upstream pressure always at a fixed differential (approximately 5 PSI). Use this controlled following pressure through the pilot circuit and to the top of the piston, where it will operate the main valve independently of the main line pressure drop. The controlled following pressure from the A2BOP must be enough higher than the upstream pressure to provide reliable operation at all times, but not so high at any time as to cause excessive leakage, which would reduce evaporator capacity.

All Type A4 Regulating Valves arranged for LPD operation must also be sized for LPD operation. The capacity of a regulator at 1/2 PSI pressure drop will be 50% of the capacity at 2 PSI pressure drop for the same inlet conditions.



The basic LPD assembly includes:

- Compensated pressure regulator (A2BOP)
- Gauge valves:
  2 with inlet regulator, 3 with outlet regulator
- 760mm Hg to 10.5 bar (30" Hg to 150 lb.) gauges:
  2 with inlet regulator, 3 with outlet regulator

NOTE: Not available with Variations E, L, K or R.

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Broadview, IL 60155 USA

Basic Inlet Regulators, 20-100mm (¾ - 4")

A4 inlet regulators open on a rise in inlet pressure above the set point and close on a drop in inlet pressure below the set point. The inlet pressure set point is not appreciably affected by variations in outlet pressure.

Regulators are pilot operated using upstream pressure for the opening force and requires a minimum 0.14 bar (2 psig) pressure drop to fully open. They modulate the flow of refrigerant gas or liquid to maintain constant upstream (or inlet) pressure as set-for, despite load fluctuations.

The **A4D dual pressure regulator** is capable of regulating at two different set points using a pair of pilot regulators controlled by a solenoid valve. A4DD regulates three set points (low/mid range/high).

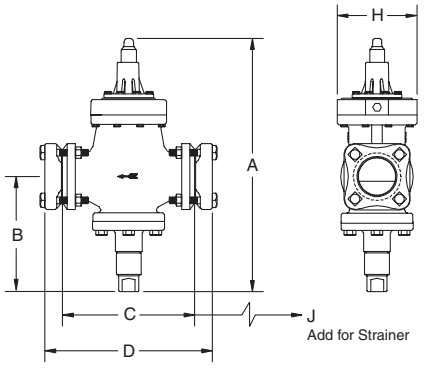
The **A4K reseating relief regulator** is factory set and sealed at a specified set-point.

The **A4AR** is a main valve only and will control pressures as determined by the remote pilot(s) piped to it.

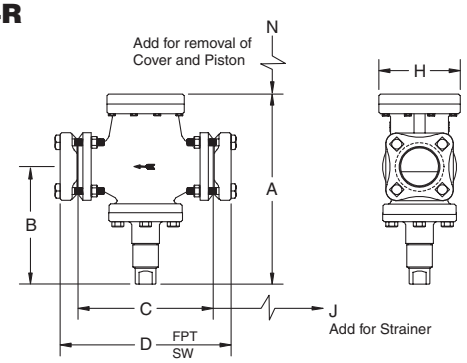
See Pages 24-25 for weld end body regulators.

Dimensions

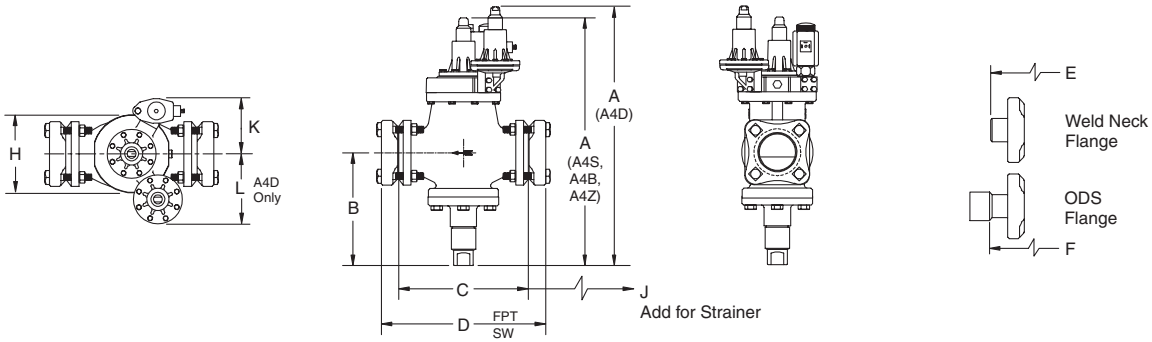
A4
A4E
A4K



A4R



A4B
A4S
A4Z
A4D



OVERALL VALVE DIMENSIONS																				
Port Size		20mm & 25mm (3/4 & 1 ")			32mm (1-1/4")			40mm & 50mm (1-5/8 & 2")			65mm (2-1/2")			75mm (3")			100mm (4")		
DIMENSION			mm	inches		mm	inches		mm	inches		mm	inches		mm	inches		mm	inches
A	A4 Basic		392	15.4		410	16.1		464	18.2		483	19.0		597	23.5		653	25.7
	A4R		241	9.5		254	10.0		307	12.1		325	12.8		432	17.0		478	18.8
	A4S, B, Z		392	15.4		410	16.6		484	16.2		483	19.0		597	23.5		653	25.7
	A4D		429	16.9		447	17.6		500	19.7		513	20.2		632	24.9		685	27.0
B			148	5.8		162	6.3		177	6.9		181	7.1		273	10.7		292	11.5
C			164	6.2		203	8.0		251	9.9		252	9.9		311	12.2		359	14.1
H			117	4.6		117	4.6		140	5.5		159	6.2		176	7.0		222	8.8
J			98	3.9		178	7.0		251	9.9		314	12.4		314	12.4		363	14.3
K			112	4.4		112	4.4		117	4.6		124	4.9		142	5.6		157	6.2
L			122	4.8		122	4.8		135	5.3		133	5.2		122	4.8		152	6.0
M			138	5.4		138	5.4		140	5.5		150	5.9		170	6.6		190	7.7
OVERALL LENGTH DIMENSIONS WITH FLANGE																				
D*	FPT & SW FOR PIPE SIZES	3/4"	216	8.5	1-1/4"	256	10.1	1-1/2"	307	12.1	2-1/2"	331	13.0	3"	389	15.3	4"	450	17.7
		1"	216	8.5	1-1/2"	256	10.1	2"	307	12.1									
		1-1/4"	216	8.5															
E*	WN FOR FLANGE FOR PIPE SIZES	3/4"	254	10.0	1-1/4"	300	11.8	1-1/2"	364	14.3	2-1/2"	401	15.8	3"	478	18.8	4"	571	22.5
		1"	261	10.3	1-1/2"	304	12.0	2"	371	14.6									
		1-1/4"	261	10.3															
F*	ODS FOR TUBE SIZES	7/8"	239	9.4	1-3/8"	269	10.6	1-5/8"	358	14.1	2-5/8"	348	13.7	3-1/8"	414	16.3	4-1/8"	503	19.8
		1-1/8"	239	9.4	1-5/8"	279	11.0	2-1/8"	338	13.3									
		1-3/8"	231	9.1	2-1/8"	305	12.0	2-5/8"	358	14.1	3-1/8"	389	15.3	3-5/8"	432	17.0			
		1-5/8"	239	9.4															

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How to Order Basic Inlet Regulators

Regulators can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Variation	Range	Reduced Capacity	Inlet Flange	Outlet Flange	Gauge	Gauge Valve	Low Press. Drop	Coil Voltage, Style	Pilot Light	Lens Color	Strainer	Check Valve
020	A4	E	V	0	F08	F08	A2	A	0	12	0	0	S	4

Port Size

020	20mm (3/4")
025	25mm (1")
032	32mm (1-1/4")
040	40mm (1-1/2")
050	50mm (2")
065	65mm (2-1/2")
075	75mm (3")
100	100mm (4")

Function

Blank	Basic Inlet Regulator
S	Electric Shut-Off
B	Electric Wide Opening
BS	Electric Wide Opening & Shut-Off
D	Dual Pressure (Low/High)
DD	Dual Pressure (Low/Mid/High)
DS	Dual Pressure & Electric Shut-Off
DB	Dual Pressure & Electric Wide Opening
E	Externally Equalized
ES	Externally Equalized & Electric Shut-Off
K	Reseating Relief
BK	Electric Wide Opening & Reseating Relief
R	Main Regulator only (Order Remote Pilot Separately)
Z	Basic Regulator with Modudapter® & 2 Moduplates®

Pressure Range*

A	0-10.3 Bar (0-150 PSIG)
D	5.2-19.3 Bar (75-280 PSIG)
V	500mm Hg to 8.3 Bar (20 in Hg to 120 PSIG)
X	No Range (A4R only)

* For dual pressure variations (D, DS, DB), specify a pressure range for each pilot regulator (low/high), i.e. AD. For A4DD, specify low/mid/high, i.e., VAD.

See Availability Table!

Flange Type	Connection
X Less Flanges	00 None
F FPT (IPS) S SW (IPS) W Weld Neck (IPS)	06 ¾" 08 1" 10 1¼" 12 1½" 16 2" 20 2½" 24 3" 32 4"
K ODS (US) *Not suitable for use with ammonia.*	07 7/8" 09 1 1/8" 11 1 3/8" 13 1 5/8" 17 2 1/8" 21 2 5/8" 25 3 1/8" 29 3 5/8" 33 4 1/8"
D DIN Weld Neck M Insert Metric C EC-Br Copper	Enter size from table below.

Reduced Capacity Plugs (See page 8)

0	Full Capacity
1	17%
3	35%
5	50%

Gauge Size, Range, Type

N	No Gauge
A	2½" Low Pressure, English
B	3½" Low Pressure, English
C	2½" High Pressure, English
D	3½" High Pressure, English
E	2½" Low Pressure, Metric
F	3½" Low Pressure, Metric
G	2½" High Pressure, Metric
H	3½" High Pressure, Metric

Gauge Valve

N	No Valve
A	1/4" Angle Body

Refrigerant

0	No Gauge
7	R-717
1	R-134a
2	R-22
4	R-404A
5	R-507

LPD?

0	No
1	Yes

Coil Voltage

0	No Coil
Standard	
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
Non-Standard	
A	24/60
C	480/60
D	24/50
F	48/50
H	24V DC
K	48V DC
W	120V DC

Coil Style ★

0	No Coil or Housing
1	Encapsulated w/36" Leads
L*	Encapsulated w/36" Leads & Pilot Light
2	Encapsulated w/DIN Connector
D*	Encapsulated w/DIN Connector & Pilot Light
5	Explosion Proof
8	Compact C,D Operator w/18" Leads
9	Compact C,D Operator w/DIN Connector

★ See page 30 for available coils by voltage.

* Integral pilot light. Lens color designated separately

Remote Pilot Light▲

0	None
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

▲ With coils 1 & 8 only. See table on page 30 for voltages.

Lens Color

0	None
G	Green (std)
R	Red
A	Amber
W	White

Strainer?

N	No
S	Yes

Check Valve

0	None
1	w/CK-1
4	w/CK-4

Flange Availability & Weights

Table shows flange size codes available by flange type for each port size code

Port Code	Flange Connections Available						Weight					
	FPT (IPS)	Socket Weld (IPS) Weld Neck (IPS)	ODS (US)	DIN Weld Neck	Insert Metric	EC-Br Copper	Regulator		w/Flanges		w/Str. & Flg.	
							kg	lb	kg	lb	kg	lb
020	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	9.1	20	10	22	14	29
025	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	9.1	20	10	22	14	29
032	10 12	10 12	11 13 17	32 40 50		30 36 42	13	28	14	31	21	46
040	12 16	12 16	13 17 21	40 50			28	62	31	68	45	100
050	12 16	12 16	13 17 21	40 50			28	62	31	68	45	100
065		20	21 25	65 75			34	75	39	85	65	144
075		24	25 29	75			47	104	54	120	81	179
100		32	33	A0			72	159	80	177	132	291

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Basic Outlet Regulators, 20-100mm (¾ - 4")

Outlet regulators modulate flow of refrigerant gas or liquid to maintain a constant downstream pressure as set-for, despite fluctuations in load. The regulator will gradually close when downstream pressure begins to rise above the setting and will gradually open when pressure begins to fall below the setting.

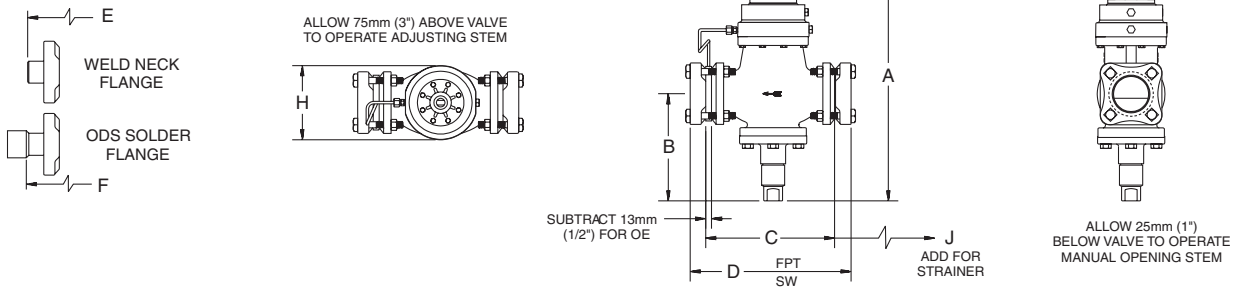
A4 Regulators are pilot operated using upstream pressure for the opening force and requires a minimum 0.14 bar (2 psig) pressure drop to fully open.

The regulator cannot maintain set-for pressure if uncontrolled branch pipe lines feed into the main pipeline downstream of the A4AO Regulator.

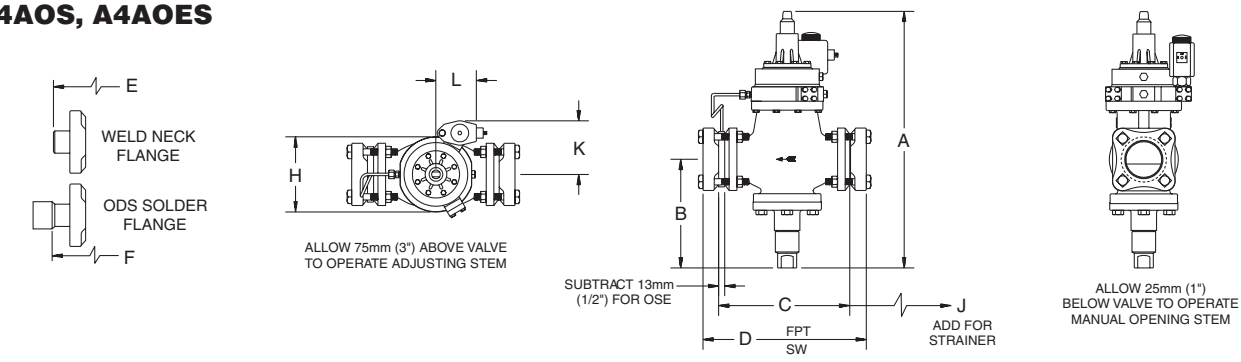
These valves are generally ordered with close coupled strainer to prevent entrance of foreign material into the valve and the rest of the system.

See Pages 24-25 for weld end body regulators.

A4AO, A4AOE



A4AOS, A4AOES



OVERALL VALVE DIMENSIONS

Port Size		20mm & 25mm (3/4 & 1")			32mm (1-1/4")			40mm & 50mm (1-5/8 & 2")			65mm (2-1/2")			75mm (3")			100mm (4")		
DIMENSION			mm	inches		mm	inches		mm	inches		mm	inches		mm	inches		mm	inches
A			454	17.9		472	18.6		525	20.7		538	21.2		657	25.9		710	28.4
B			148	5.8		162	6.3		177	6.9		181	7.1		273	10.7		292	11.5
C*			177	6.7		216	8.5		264	10.4		264	10.4		324	12.7		352	14.6
H			117	4.6		117	4.6		140	5.5		159	6.2		178	7.0		222	8.8
J			98	3.9		178	7.0		251	9.9		314	12.4		314	12.4		363	14.3
K			112	4.4		112	4.4		117	4.6		124	4.9		142	5.6		157	6.2
L			122	4.8		122	4.8		135	5.3		133	5.2		122	4.8		152	6.0
OVERALL LENGTH DIMENSIONS WITH FLANGES ***Subtract 13mm (0.5") from C, D, E & F Dimensions for E Variation**																			
D*	FPT & SW FOR PIPE SIZES	3/4"	229	9.0	1-1/4"	269	10.6	1-1/2"	320	12.6	2-1/2"	344	13.5	3"	402	15.8	4"	463	18.2
		1"	229	9.0	1-1/2"	269	10.6	2"	320	12.6									
		1-1/4"	229	9.0															
E*	WN FOR FOR PIPE SIZES	3/4"	267	10.5	1-1/4"	313	12.3	1-1/2"	377	14.8	2-1/2"	414	16.1	3"	491	19.3	4"	584	23.0
		1"	274	10.8	1-1/2"	317	12.5	2"	384	15.1									
		1-1/4"	274	10.8															
F*	ODS FOR TUBE SIZES	7/8"	252	9.9	1-3/8"	282	11.1	1-5/8"	371	14.6	2-5/8"	361	14.2	3-1/8"	427	16.8	4-1/8"	516	20.3
		1-1/8"	252	9.9	1-5/8"	292	11.5	2-1/8"	351	13.8									
		1-3/8"	244	9.6	2-1/8"	318	12.5	2-5/8"	371	14.6	3-1/8"	402	15.8	3-5/8"	445	17.5			
		1-5/8"	252	9.9															

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How to Order Outlet Regulators

Regulators can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Variation	Range	Reduced Capacity	Inlet Flange	Outlet Flange	Gauge	Gauge Valve	Low Press. Drop	Coil Voltage, Style	Pilot Light	Lens Color	Strainer	Check Valve
020	A4	OE	V	0	F08	F08	A2	A	0	21	0	0	S	4

Port Size

020	20mm (3/4")
025	25mm (1")
032	32mm (1-1/4")
040	40mm (1-1/2")
050	50mm (2")
065	65mm (2-1/2")
075	75mm (3")
100	100mm (4")

Variation

O	Basic Outlet Regulator
OS	w/ Electric Shut-Off
OB	w/ Electric Wide Opening
OBS	w/ Electric Wide Opening & Shut-Off
OD	w/ Dual Pressure
OE	Externally Equalized
OES	Externally Equalized & Electric Shut-Off

Pressure Range*

D	5.2-19.3 Bar (75-280 PSIG)
V	500mm Hg to 8.3 Bar (20 in Hg to 120 PSIG)

*For dual pressure variation (OD), enter pressure range for each pilot regulator, i.e. VD (low/high).

Reduced Capacity Plugs (see page 8)

0	Full Capacity
1	17%
3	35%
5	50%

See Availability Table!

Flange Type	Connection
X Less Flanges	00 None
F FPT (IPS) S SW (IPS) W Weld Neck (IPS)	06 ¾" 08 1" 10 1¼" 12 1½" 16 2" 20 2½" 24 3" 32 4"
K ODS (US) *Not suitable for use with ammonia.*	07 7/8" 09 1 1/8" 11 1 3/8" 13 1 5/8" 17 2 1/8" 21 2 5/8" 25 3 1/8" 29 3 5/8" 33 4 1/8"
D DIN Weld Neck M Insert Metric C EC-Br Copper	Enter size from table below.

Gauge Size, Range, Type

0	No Gauge
A	2½" Low Pressure, English
B	3½" Low Pressure, English
C	2½" High Pressure, English
D	3½" High Pressure, English
E	2½" Low Pressure, Metric
F	3½" Low Pressure, Metric
G	2½" High Pressure, Metric
H	3½" High Pressure, Metric

Body

N	No Valve
A	1/4" Angle Body

Refrigerant

0	No Gauge
7	R-717
1	R-134a
2	R-22
4	R-404a
5	R-507

LPD?

0	No
1	Yes

Coil Voltage

0	No Coil
Standard	
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
Non-Standard	
A	24/60
C	480/60
D	24/50
F	48/50
H	24V DC
K	48V DC
W	120V DC

Coil Style ★

0	No Coil or Housing
1	Encapsulated w/36" Leads
L*	Encapsulated w/36" Leads & Pilot Light
2	Encapsulated w/DIN Connector
D*	Encapsulated w/DIN Connector & Pilot Light
5	Explosion Proof
8	Compact C,D Operator w/18" Leads
9	Compact C,D Operator w/DIN Connector

★ See page 30 for available coils by voltage.

* Integral pilot light. Lens color designated separately

Pilot Light

0	None
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

▲ With coils 1 & 8 only. See table on page 30 for voltages.

Lens Color

0	No Pilot Light
G	Green (std)
R	Red
A	Amber
W	White

Strainer?

N	No
S	Yes

Check Valve

0	None
1	w/CK-1
4	w/CK-4

Flange Availability & Weights

Table shows flange size codes available by flange type for each port size code

Port Code	Flange Connections Available						Weight					
	FPT (IPS)	Socket Weld (IPS) Weld Neck (IPS)	ODS (US)	DIN Weld Neck	Insert Metric	EC-Br Copper	Regulator		w/Flanges		w/Str. & Flg.	
							kg	lb	kg	lb	kg	lb
020	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	9.1	20	10	22	14	29
025	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	9.1	20	10	22	14	29
032	10 12	10 12	11 13 17	32 40 50		30 36 42	13	28	14	31	21	46
040	12 16	12 16	13 17 21	40 50			28	62	31	68	45	100
050	12 16	12 16	13 17 21	40 50			28	62	31	68	45	100
065		20	21 25	65 75			34	75	39	85	65	144
075		24	25 29	75			47	104	54	120	81	179
100		32	33	A0			72	159	80	177	132	291

Parker Climate & Industrial Controls

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

Differential & Pressure Compensated, 20-100mm (¾ - 4")

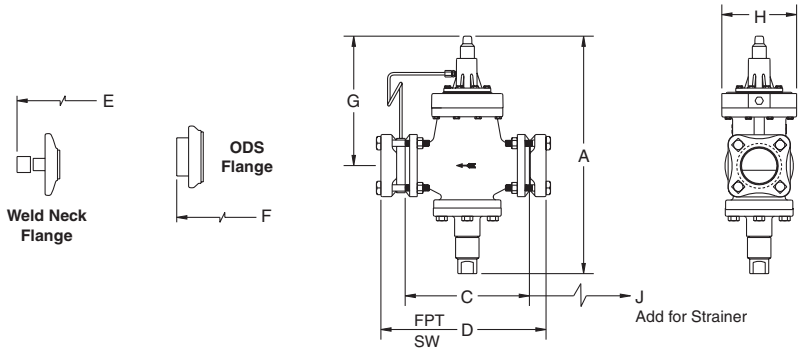
Differential regulators (A4L) modulate flow of refrigerant liquid or gas to maintain a constant set-for pressure *differential* between regulator inlet and regulator outlet.

Pneumatically compensated inlet regulators modulate the flow of refrigerant gas or liquid to maintain a varying inlet pressure (A4P) or outlet pressure (A4OP) in response to a pneumatic signal received from a pneumatic controller. The regulator *set-point will be directly varied* on a 1:1 basis with value of the air pressure supplied to the bonnet. A 3:1 set-point variation is also available for inlet pressure regulators (A3P). Generally the pneumatic controller modulates the air pressure from 3 to 15 PSIG throughout its control range.

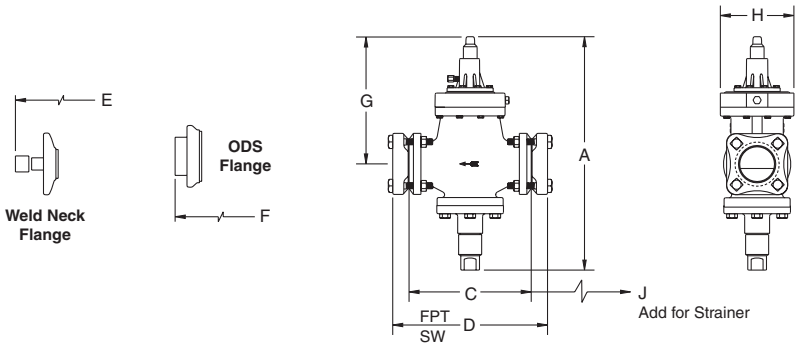
See Pages 24-25 for weld end body regulators.

Dimensions

A4L



A4P
A43P



OVERALL VALVE DIMENSIONS

Port Size		20mm & 25mm (3/4 & 1")			32mm (1-1/4")			40mm & 50mm (1-5/8 & 2")			65mm (2-1/2")			75mm (3")			100mm (4")		
DIMENSION			mm	inches		mm	inches		mm	inches		mm	inches		mm	inches		mm	inches
A	A4P, A4L		392	15.4		410	15.6		464	16.2		483	19.0		597	23.5		653	25.7
	A43P		414	16.3		432	17.0		485	19.1		505	19.9		620	24.4		676	26.6
C			164	6.2		203	8.0		251	9.9		252	9.9		311	12.2		359	14.1
G	A4P, A4L		244	9.6		248	9.8		287	11.3		302	11.9		324	12.8		361	14.2
	A43P		266	10.5		270	10.7		308	12.2		324	12.8		347	13.7		384	15.1
H			117	4.6		117	4.6		140	5.5		159	6.2		176	7.0		222	8.8
J			98	3.9		178	7.0		251	9.9		314	12.4		314	12.4		363	14.3
OVERALL LENGTH DIMENSIONS WITH FLANGES ***Add 13mm (0.5") to D, E & F Dimensions for A4L Variation**																			
D*	FPT & SW	3/4"	216	8.5	1-1/4"	256	10.1	1-1/2"	307	12.1									
	FOR PIPE	1"	216	8.5	1-1/2"	256	10.1	2"	307	12.1	2-1/2"	331	13.0	3"	389	15.3	4"	450	17.7
	SIZES	1-1/4"	216	8.5															
E*	WN FOR	3/4"	254	10.0	1-1/4"	300	11.8	1-1/2"	364	14.3									
	FOR PIPE	1"	261	10.3	1-1/2"	304	12.0	2"	371	14.6	2-1/2"	401	15.8	3"	478	18.8	4"	571	22.5
	SIZES	1-1/4"	261	10.3															
F*	ODS FOR	7/8"	239	9.4	1-3/8"	269	10.6	1-5/8"	358	14.1	2-5/8"	348	13.7	3-1/8"	414	16.3			
	TUBE	1-1/8"	239	9.4	1-5/8"	279	11.0	2-1/8"	338	13.3									
	SIZES	1-3/8"	231	9.1	2-1/8"	305	12.0	2-5/8"	358	14.1	3-1/8"	389	15.3	3-5/8"	432	17.0	4-1/8"	503	19.8
		1-5/8"	239	9.4															

Parker Climate & Industrial Controls

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

How to Order Differential & Pressure Compensated Regulators

Regulators can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Variation	Range	Reduced Capacity	Inlet Flange	Outlet Flange	Gauge	Gauge Valve	Low Press. Drop	Coil Voltage, Style	Pilot Light	Lens Color	Strainer	Check Valve
020	A4	BL	VA	0	F08	F08	2A	A1	0	21	0	0	S	4

Port Size

020	20mm (3/4")
025	25mm (1")
032	32mm (1-1/4")
040	40mm (1-1/2")
050	50mm (2")
065	65mm (2-1/2")
075	75mm (3")
100	100mm (4")

Variation

L	Differential
BL	Differential & Electrical Wide Opening
P	Inlet Reg., 1:1 Pneumatic Compensation
PB	Inlet Reg., Wide Opening & 1:1 Pneumatic Comp.
PS	Inlet Reg., Electric Shut-Off & 1:1 Pneumatic Comp.
PE	Inlet Reg., Externally Equalized & 1:1 Pneumatic Comp.
3P	Inlet Reg., 3:1 Pneumatic Compensation
3PS	Inlet Reg., Electric Shut-Off & 3:1 Pneumatic Comp.
OP	Outlet Reg., 1:1 Pneumatic Compensation
OPS	Outlet Reg., Electric Shut-Off & 1:1 Pneumatic Comp.

Pressure Range

A*	0-10.3 Bar (0-150 PSIG)
D	5.2-19.3 Bar (75-280 PSIG)
V	500mm Hg to 8.3 Bar (20 in Hg to 120 PSIG)

* Not available on outlet regulators (OP, OPS).

See Availability Table!

Flange Type	Connection
X Less Flanges	00 None
F FPT (IPS) S SW (IPS) W Weld Neck (IPS)	06 ¾" 08 1" 10 1¼" 12 1½" 16 2" 20 2½" 24 3" 32 4"
K ODS (US) *Not suitable for use with ammonia.*	07 7/8" 09 1 1/8" 11 1 3/8" 13 1 5/8" 17 2 1/8" 21 2 5/8" 25 3 1/8" 29 3 5/8" 33 4 1/8"
D DIN Weld Neck M Insert Metric C EC-Br Copper	Enter size from table below.

Reduced Capacity Plugs (see page 8)

0	Full Capacity
1	17%
3	35%
5	50%

Gauge Size, Range, Type

0	No Gauge
A	2½" Low Pressure, English
B	3½" Low Pressure, English
C	2½" High Pressure, English
D	3½" High Pressure, English
E	2½" Low Pressure, Metric
F	3½" Low Pressure, Metric
G	2½" High Pressure, Metric
H	3½" High Pressure, Metric

Gauge Valve

N	No Valve
A	1/4" Angle Body

Refrigerant

0	No Gauge
7	R-717
1	R-134a
2	R-22
4	R-404A
5	R-507

LPD?

0	No
1*	Yes

* N/A with "L" variation.

Coil Voltage

0	No Coil
Standard	
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
Non-Standard	
A	24/60
C	480/60
D	24/50
F	48/50
H	24V DC
K	48V DC
W	120V DC

Coil Style ★

0	No Coil or Housing
1	Encapsulated w/36" Leads
L*	Encapsulated w/36" Leads & Pilot Light
2	Encapsulated w/DIN Connector
D*	Encapsulated w/DIN Connector & Pilot Light
5	Explosion Proof
8	Compact C,D Operator w/18" Leads
9	Compact C,D Operator w/DIN Connector

★ See page 30 for available coils by voltage.

* Integral pilot light. Lens color designated separately

Pilot Light

Remote Pilot Light▲

0	None
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

▲ With coils 1 & 8 only. See table on page 30 for voltages.

Lens Color

0	No Pilot Light
G	Green (std)
R	Red
A	Amber
W	White

Strainer?

N	No
S	Yes

Check Valve

0	None
1	w/CK-1
4	w/CK-4

Flange Availability & Weights

Table shows flange size codes available by flange type for each port size code

Port Code	Flange Connections Available						Weight					
	FPT (IPS)	Socket Weld (IPS) Weld Neck (IPS)	ODS (US)	DIN Weld Neck	Insert Metric	EC-Br Copper	Regulator		w/Flanges		w/Str. & Flg.	
							kg	lb	kg	lb	kg	lb
020	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	9.1	20	10	22	14	29
025	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	9.1	20	10	22	14	29
032	10 12	10 12	11 13 17	32 40 50		30 36 42	13	28	14	31	21	46
040	12 16	12 16	13 17 21	40 50			28	62	31	68	45	100
050	12 16	12 16	13 17 21	40 50			28	62	31	68	45	100
065		20	21 25	65 75			34	75	39	85	65	144
075		24	25 29	75			47	104	54	120	81	179
100		32	33	A0			72	159	80	177	132	291

Parker Climate & Industrial Controls

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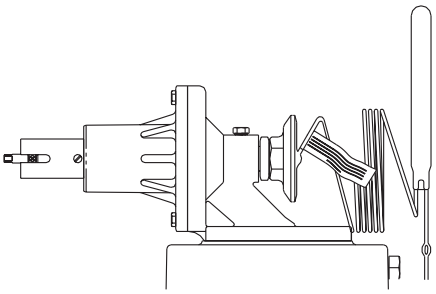
Broadview, IL 60155 USA

Temperature Operated Regulators (20-100mm)

The temperature compensated pressure regulator differs from the conventional pressure regulator in that rather than maintaining a previously set constant pressure, this regulator modulates pressure in accordance with the demands of the load. The regulator will vary its pressure set point as load demand varies as sensed by the thermal bulb. This valve responds to temperature changes only.

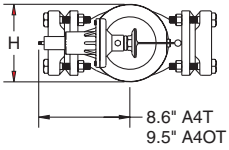
See Pages 24-25 for weld end body regulators.

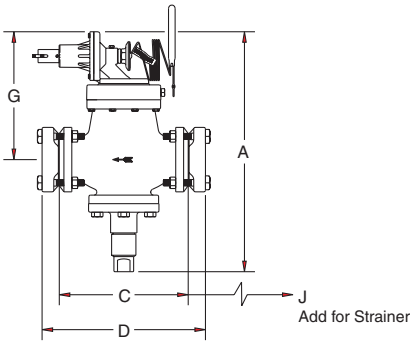


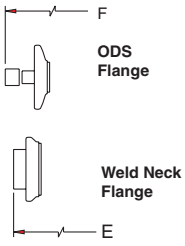
Temperature Module

Dimensions

A4T, A4OT







OVERALL VALVE DIMENSIONS																				
Port Size		**20mm & 25mm (3/4 & 1")**			**32mm (1-1/4")**			**40mm & 50mm (1-5/8 & 2")**			**65mm (2-1/2")**			**75mm (3")**			**100mm (4")**		
DIMENSION			**mm**	**inches**		**mm**	**inches**		**mm**	**inches**		**mm**	**inches**		**mm**	**inches**		**mm**	**inches**
A			378	14.9		396	15.6		450	17.7		470	18.5		582	23.0		665	26.2
C			164	6.2		203	8.0		251	9.9		252	9.9		311	12.2		359	14.1
G			244	9.6		248	9.8		287	11.3		302	11.9		324	12.8		361	14.2
H			117	4.6		117	4.6		140	5.5		159	6.2		176	7.0		222	8.8
J			98	3.9		178	7.0		251	9.9		314	12.4		314	12.4		363	14.3
OVERALL LENGTH DIMENSIONS WITH FLANGES ***Add 13mm (0.5") to D, E & F Dimensions for A4OT Variation**																				
D*	FPT & SW FOR PIPE SIZES	3/4"	216	8.5	1-1/4"	256	10.1	1-1/2"	307	12.1	2-1/2"	331	13.0	3"	389	15.3	4"	450	17.7
		1"	216	8.5	1-1/2"	256	10.1	2"	307	12.1									
		1-1/4"	216	8.5															
E*	WN FOR FLANGE PIPE SIZES	3/4"	254	10.0	1-1/4"	300	11.8	1-1/2"	364	14.3	2-1/2"	401	15.8	3"	478	18.8	4"	571	22.5
		1"	261	10.3	1-1/2"	304	12.0	2"	371	14.6									
		1-1/4"	261	10.3															
F*	ODS FOR TUBE SIZES	7/8"	239	9.4	1-3/8"	269	10.6	1-5/8"	358	14.1	2-5/8"	348	13.7	3-1/8"	414	16.3	4-1/8"	503	19.8
		1-1/8"	239	9.4	1-5/8"	279	11.0	2-1/8"	338	13.3									
		1-3/8"	231	9.1	2-1/8"	305	12.0	2-5/8"	358	14.1	3-1/8"	389	15.3	3-5/8"	432	17.0			
		1-5/8"	239	9.4															

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Refrigerating Specialties Division
Broadview, IL 60155 USA

How to Order Temperature Operated Regulators

Regulators can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Variation	Range	Reduced Capacity	Inlet Flange	Outlet Flange	Gauge	Gauge Valve	Low Limit Reg.	Coil Voltage, Style	Pilot Light	Lens Color	Strainer	Check Valve
020	A4	OTS	1	0	F08	F08	A2	A	0	21	0	0	S	4

Port Size

020	20mm (3/4")
025	25mm (1")
032	32mm (1-1/4")
040	40mm (1-1/2")
050	50mm (2")
065	65mm (2-1/2")
075	75mm (3")
100	100mm (4")

Function

Direct: Opens on Rise in Temp.	
T	Temperature Operated
TS	Shut-Off & Temperature Operated
TB	Wide Opening & Temperature Operated
DT	Dual Pressure & Temperature Operated
DTB	Wide Opening, Dual Pressure & Temp. Op.
DTS	Shut-Off, Dual Pressure & Temperature Operated
Inverse: Closes on Rise in Temp.	
OT	Temperature Operated
OET	Temperature Operated, Externally Equalized
OTS	Temperature Operated & Electric Shut-Off

Range

1	Low Temperature: -30° to +30°C (-20° to +80°F)
2	High Temperature: +20° to +60°C (+60° to +140°F)
For "D" Variations (Temp + Pressure)	
3	Low Temperature + Range A
4	Low Temperature + Range D
5	Low Temperature + Range V
6	High Temperature + Range D

See Availability Table!

Flange Type	Connection
X Less Flanges	00 None
F FPT (IPS) S SW (IPS) W Weld Neck (IPS)	06 ¾" 08 1" 10 1¼" 12 1½" 16 2" 20 2½" 24 3" 32 4"
K ODS (US) *Not suitable for use with ammonia.*	07 7/8" 09 1 1/8" 11 1 3/8" 13 1 5/8" 17 2 1/8" 21 2 5/8" 25 3 1/8" 29 3 5/8" 33 4 1/8"
D DIN Weld Neck M Insert Metric C EC-Br Copper	Enter size from table below.

Reduced Capacity Plugs (see page 8)

0	Full Capacity
1	17%
3	35%
5	50%

Gauge Size, Range, Type

0	No Gauge
A	2½" Low Pressure, English
B	3½" Low Pressure, English
C	2½" High Pressure, English
D	3½" High Pressure, English
E	2½" Low Pressure, Metric
F	3½" Low Pressure, Metric
G	2½" High Pressure, Metric
H	3½" High Pressure, Metric

Gauge Valve

N	No Valve
A	1/4" Angle Body

Refrigerant

0	No Gauge
7	R-717
1	R-134a
2	R-22
4	R-404a
5	R-507

Low Limit Regulator

0	No
1	Yes

Coil Voltage

0	No Coil
Standard	
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
Non-Standard	
A	24/60
C	480/60
D	24/50
F	48/50
H	24V DC
K	48V DC
W	120V DC

Coil Style ★

0	No Coil or Housing
1	Encapsulated w/36" Leads
L*	Encapsulated w/36" Leads & Pilot Light
2	Encapsulated w/DIN Connector
D*	Encapsulated w/DIN Connector & Pilot Light
5	Explosion Proof
8	Compact C,D Operator w/18" Leads
9	Compact C,D Operator w/DIN Connector

★ See page 30 for available coils by voltage.

* Integral pilot light. Lens color designated separately

Pilot Light

Remote Pilot Light▲

0	None
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

▲ With coils 1 & 8 only. See table on page 30 for voltages.

Lens Color

0	No Pilot Light
G	Green (std)
R	Red
A	Amber
W	White

Strainer?

N	No
S	Yes

Check Valve

0	None
1	w/CK-1
4	w/CK-4

Flange Availability & Weights

Table shows flange size codes available by flange type for each port size code

Port Code	Flange Connections Available						Weight					
	FPT (IPS)	Socket Weld (IPS) Weld Neck (IPS)	ODS (US)	DIN Weld Neck	Insert Metric	EC-Br Copper	Regulator		w/Flanges		w/Str. & Flg.	
							kg	lb	kg	lb	kg	lb
020	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	9.1	20	10	22	14	29
025	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	9.1	20	10	22	14	29
032	10 12	10 12	11 13 17	32 40 50		30 36 42	13	28	14	31	21	46
040	12 16	12 16	13 17 21	40 50			28	62	31	68	45	100
050	12 16	12 16	13 17 21	40 50			28	62	31	68	45	100
065		20	21 25	65 75			34	75	39	85	65	144
075		24	25 29	75			47	104	54	120	81	179
100		32	33	100			72	159	80	177	132	291

Parker Climate & Industrial Controls

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

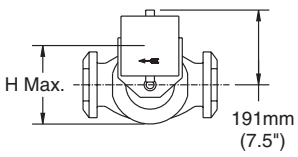
Electrically Compensated Regulators, 20-100mm (¾ - 4")

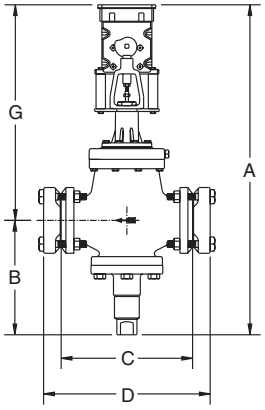
Type A4M electrically compensated inlet pressure regulators modulate the flow of refrigerant gas or liquid to maintain a varying upstream (Inlet) pressure in response to an electrical signal applied to a low-voltage motor mounted on a regulator pilot. A4OM regulators modulate outlet pressure.

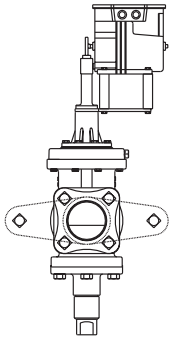
See pages 24-25 for weld end body regulators.

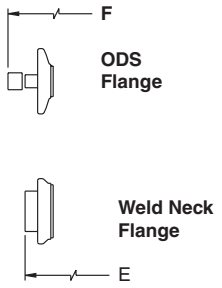
Dimensions

A4M









OVERALL VALVE DIMENSIONS																				
Port Size		**20mm & 25mm (3/4 & 1")**			**32mm (1-1/4")**			**40mm & 50mm (1-5/8 & 2")**			**65mm (2-1/2")**			**75mm (3")**			**100mm (4")**		
DIMENSION			**mm**	**inches**		**mm**	**inches**		**mm**	**inches**		**mm**	**inches**		**mm**	**inches**		**mm**	**inches**
A	A4M		597	23.5		615	24.2		668	26.3		688	27.1		803	31.6		859	33.8
	A4OM		620	22.4		638	23.1		691	25.2		711	26.0		826	32.5		882	34.7
B			148	5.8		162	6.3		177	6.9		181	7.1		273	10.7		292	11.5
C			164	6.2		203	8.0		251	9.9		252	9.9		311	12.2		359	14.1
G	A4M		449	17.7		453	17.9		491	19.4		507	20.0		530	20.9		566	22.3
	A4OM		472	18.6		476	18.8		514	20.3		530	20.9		553	21.8		589	23.2
H			117	4.6		117	4.6		140	5.5		159	6.2		176	7.0		222	8.8
OVERALL LENGTH DIMENSIONS WITH FLANGES ***Add 13mm (0.5") to D, E & F Dimensions for A4OM Variation**																				
D*	FPT & SW	3/4"	216	8.5	1-1/4"	256	10.1	1-1/2"	307	12.1										
	FOR PIPE	1"	216	8.5	1-1/2"	256	10.1	2"	307	12.1	2-1/2"	331	13.0	3"	389	15.3	4"	450	17.7
	SIZES	1-1/4"	216	8.5															
E*	WN FOR	3/4"	254	10.0	1-1/4"	300	11.8	1-1/2"	364	14.3										
	FOR PIPE	1"	261	10.3	1-1/2"	304	12.0	2"	371	14.6	2-1/2"	401	15.8	3"	478	18.8	4"	571	22.5
	SIZES	1-1/4"	261	10.3															
F*	ODS FOR	7/8"	239	9.4	1-3/8"	269	10.6	1-5/8"	358	14.1	2-5/8"	348	13.7	3-1/8"	414	16.3			
	TUBE	1-1/8"	239	9.4	1-5/8"	279	11.0	2-1/8"	338	13.3									
	SIZES	1-3/8"	231	9.1	2-1/8"	305	12.0	2-5/8"	358	14.1	3-1/8"	389	15.3	3-5/8"	432	17.0	4-1/8"	503	19.8
		1-5/8"	239	9.4															

How to Order Electrically Compensated Regulators

Regulators can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Variation	Range	Reduced Capacity	Inlet Flange	Outlet Flange	Gauge	Gauge Valve	Low Press. Drop	Coil Voltage, Style	Pilot Light	Lens Color	Strainer	Check Valve
020	A4	OMS1	D	0	F08	F08	A2	A	0	21	0	0	S	4

Port Size

020	20mm (3/4")
025	25mm (1")
032	32mm (1-1/4")
040	40mm (1-1/2")
050	50mm (2")
065	65mm (2-1/2")
075	75mm (3")
100	100mm (4")

Variation

M	Inlet Regulator
MS	With Electric Shut-Off
BM	WithElectric Wide Opening
DM	With Dual Pressure
OM	Electrically Compensated Outlet Regulator
OMS	Outlet Regulator with Electric Shut-Off

Motor Style

H	Motor Hardware Only
	Honeywell Motors
1	24V 50/60Hz Std. Cam, 120V Transformer
A	Option 1 with 240V Transformer
2	24V 50/60Hz Low Rise Cam, 120V Transformer
B	Option 2 with 240V Transformer
3	4-20 mA, 120V 50/60Hz Standard Cam
4	4-20 mA, 120V 50/60Hz Low Rise Cam
5	4-20 mA, 240V 50/60Hz Standard Cam
6	220V 50Hz Std. Cam
7	220V 50Hz Low Rise Cam
	Penn Motors
8	24V 50/60Hz Std. Cam, 120V Transformer
C	Option 8 with 240V Transformer
9	24V 50/60Hz Low Rise Cam, 120 V Transformer
D	Option 9 with 240V Transformer

Pressure Range*

A**	0-10.3 Bar (0-150 PSIG)
D	5.2-19.3 Bar (75-280 PSIG)
V	500mm Hg to 8.3 Bar (20 in Hg to 120 PSIG)

See Availability Table!

Flange Type	Connection
X Less Flanges	00 None
F FPT (IPS) S SW (IPS) W Weld Neck (IPS)	06 ¾" 08 1" 10 1¼" 12 1½" 16 2" 20 2½" 24 3" 32 4"
K ODS (US) *Not suitable for use with ammonia.*	07 7/8" 09 1 1/8" 11 1 3/8" 13 1 5/8" 17 2 1/8" 21 2 5/8" 25 3 1/8" 29 3 5/8" 33 4 1/8"
D DIN Weld Neck M Insert Metric C EC-Br Copper	Enter size from table below.

Reduced Capacity Plug (see page 8)

0	Full Capacity
1	17%
3	35%
5	50%

Gauge Size, Range, Type

0	No Gauge
A	2½" Low Pressure, English
B	3½" Low Pressure, English
C	2½" High Pressure, English
D	3½" High Pressure, English
E	2½" Low Pressure, Metric
F	3½" Low Pressure, Metric
G	2½" High Pressure, Metric
H	3½" High Pressure, Metric

*For DM variation, indicate range for each pilot, i.e. AD (low/high).
** Not available with OM or OMS variation.

Body

N	No Valve
A	1/4" Angle Body

Refrigerant

0	No Gauge
7	R-717
1	R-134a
2	R-22
4	R-404a
5	R-507

LPD

0	N/A

Coil Voltage

0	No Coil
	Standard
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
	Non-Standard
A	24/60
C	480/60
D	24/50
F	48/50
H	24V DC
K	48V DC
W	120V DC

Coil Style ★

0	No Coil or Housing
1	Encapsulated w/36" Leads
L*	Encapsulated w/36" Leads & Pilot Light
2	Encapsulated w/DIN Connector
D*	Encapsulated w/DIN Connector & Pilot Light
5	Explosion Proof
8	Compact C,D Operator w/18" Leads
9	Compact C,D Operator w/DIN Connector

★ See page 30 for available coils by voltage.
* Integral pilot light. Lens color designated separately

Remote Pilot Light▲

0	None
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

▲ With coils 1 & 8 only. See table on page 30 for voltages.

Lens Color

0	No Pilot Light
G	Green (std)
R	Red
A	Amber
W	White

Strainer?

N	No
S	Yes

Check Valve

0	None
1	w/CK-1
4	w/CK-4

Flange Availability & Weights

Table shows flange size codes available by flange type for each port size code

Port Code	Flange Connections Available						Weight					
	FPT (IPS)	Socket Weld (IPS) Weld Neck (IPS)	ODS (US)	DIN Weld Neck	Insert Metric	EC-Br Copper	Regulator		w/Flanges		w/Str. & Flg.	
							kg	lb	kg	lb	kg	lb
020	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	9.1	20	10	22	14	29
025	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	9.1	20	10	22	14	29
032	10 12	10 12	11 13 17	32 40 50		30 36 42	13	28	14	31	21	46
040	12 16	12 16	13 17 21	40 50			28	62	31	68	45	100
050	12 16	12 16	13 17 21	40 50			28	62	31	68	45	100
065		20	21 25	65 75			34	75	39	85	65	144
075		24	25 29	75			47	104	54	120	81	179
100		32	33	A0			72	159	80	177	132	291

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

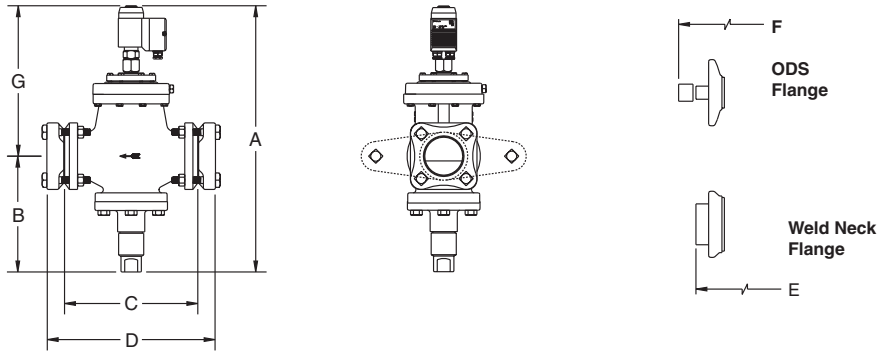
Electronic Pilot Operated Regulators, 20-100mm (¾ - 4")

Type A4J electronic pilot operated regulators utilize a Landis & Staefa M2FP03GX direct operated proportional solenoid as a pilot valve to modulate the flow of pilot pressure to the top of the regulator's piston. The positioning of the electronic pilot actuator is proportional to the input signal supplied to the electronic valve. Two separate control modules are available which respond to the supply signal from an external controller which senses the medium being cooled.

Type A4J is not available in 125-200mm (5" - 8") sizes.

Dimensions

A4J



OVERALL VALVE DIMENSIONS																			
Port Size		**20mm & 25mm (3/4 & 1")**			**32mm (1-1/4")**			**40mm & 50mm (1-5/8 & 2")**			**65mm (2-1/2")**			**75mm (3")**			**100mm (4")**		
DIMENSION			**mm**	**inches**		**mm**	**inches**		**mm**	**inches**		**mm**	**inches**		**mm**	**inches**		**mm**	**inches**
A			432	17.0		450	17.7		503	19.8		523	20.6		635	25.0		693	27.3
B			148	5.8		162	6.3		177	6.9		181	7.1		273	10.7		292	11.5
C			164	6.2		203	8.0		251	9.9		252	9.9		311	12.2		359	14.1
G			259	10.2		284	1132		325	12.8		343	13.5		366	14.4		401	15.6
H			117	4.6		117	4.6		140	5.5		159	6.2		176	7.0		222	8.8
OVERALL LENGTH DIMENSIONS WITH FLANGES																			
D*	FPT & SW FOR PIPE SIZES	3/4"	216	8.5	1-1/4"	256	10.1	1-1/2"	307	12.1									
		1"	216	8.5	1-1/2"	256	10.1	2"	307	12.1	2-1/2"	331	13.0	3"	389	15.3	4"	450	17.7
		1-1/4"	216	8.5															
E*	WN FOR FOR PIPE SIZES	3/4"	254	10.0	1-1/4"	300	11.8	1-1/2"	364	14.3									
		1"	261	10.3	1-1/2"	304	12.0	2"	371	14.6	2-1/2"	401	15.8	3"	478	18.8	4"	571	22.5
		1-1/4"	261	10.3															
F*	ODS FOR TUBE SIZES	7/8"	239	9.4	1-3/8"	269	10.6	1-5/8"	358	14.1	2-5/8"	348	13.7	3-1/8"	414	16.3			
		1-1/8"	239	9.4	1-5/8"	279	11.0	2-1/8"	338	13.3									
		1-3/8"	231	9.1	2-1/8"	305	12.0	2-5/8"	358	14.1	3-1/8"	389	15.3	3-5/8"	432	17.0	4-1/8"	503	19.8
		1-5/8"	239	9.4															

Electronic Accessories

For use with "J" variation regulators

Controllers	**Part #**
4-20 mA	105624
0-18 VDC	105625

Transformer	**Part #**
240/24	301787
120/24	301788

How to Order Electronic Pilot Operated Regulators

Regulators can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Variation	Range	Reduced Capacity	Inlet Flange	Outlet Flange	Gauge	Gauge Valve	Low Press. Drop	Coil Voltage, Style	Pilot Light	Lens Color	Strainer	Check Valve
020	A4	J1	A	0	F08	F08	A2	A	0	21	0	0	S	4

Port Size

020	20mm (3/4")
025	25mm (1")
032	32mm (1-1/4")
040	40mm (1-1/2")
050	50mm (2")
065	65mm (2-1/2")
075	75mm (3")
100	100mm (4")

Function

J	Electronic Pilot Operated
JS	Electronic Pilot Operated with Electric Shut-Off
DJ	Electronic Pilot Operated with Dual Pressure

I/O Control Module

1	4-20 mA I/O Module
2	4-20 mA with Controller
3	4-20 mA with Controller and 120/24 Transformer
4	4-20 mA with Controller and 240/24 Transformer
5	0-10 VDC I/O Module
6	0-10 VDC with Controller
7	0-10 VDC with Controller and 120/24 Transformer
8	0-10 VDC with Controller and 240/24 Transformer

Pressure Range*

A	0-10.3 Bar (0-150 PSIG)
D	5.2-19.3 Bar (75-280 PSIG)
V	500mm Hg to 8.3 Bar (20 in Hg to 120 PSIG)

*For dual pressure variation (DJ), enter pressure range for each pilot regulator, i.e. VA (low/high).

See Availability Table!

Flange Type	Connection
X Less Flanges	00 None
F FPT (IPS) S SW (IPS) W Weld Neck (IPS)	06 ¾" 08 1" 10 1¼" 12 1½" 16 2" 20 2½" 24 3" 32 4"
K ODS (US) *Not suitable for use with ammonia.*	07 7/8" 09 1 1/8" 11 1 3/8" 13 1 5/8" 17 2 1/8" 21 2 5/8" 25 3 1/8" 29 3 5/8" 33 4 1/8"
D DIN Weld Neck M Insert Metric C EC-Br Copper	Enter size from table below.

Reduced Capacity Plugs (see page 8)

0	Full Capacity
1	17%
3	35%
5	50%

Gauge Size, Range, Type

0	No Gauge
A	2½" Low Pressure, English
B	3½" Low Pressure, English
C	2½" High Pressure, English
D	3½" High Pressure, English
E	2½" Low Pressure, Metric
F	3½" Low Pressure, Metric
G	2½" High Pressure, Metric
H	3½" High Pressure, Metric

Gauge Valve

N	No Valve
A	1/4" Angle Body

Refrigerant

0	No Gauge
7	R-717
1	R-134a
2	R-22
4	R-404a
5	R-507

LPD

0	No

Coil Voltage

0	No Coil
Standard	
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
Non-Standard	
A	24/60
C	480/60
D	24/50
F	48/50
H	24V DC
K	48 VDC
W	120V DC

Coil Style ★

0	No Coil or Housing
1	Encapsulated w/36" Leads
L	Encapsulated w/36" Leads & Pilot Light*
2	Encapsulated w/DIN Connector
D	Encapsulated w/DIN Connector & Pilot Light*
5	Explosion Proof
8	Compact C,D Operator w/18" Leads
9	Compact C,D Operator w/DIN Connector

★ See page 30 for available coils by voltage.
* Integral pilot light. Lens color designated separately

Remote Pilot Light▲

0	None
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

▲ With coils 1 & 8 only. See table on page 30 for voltages.

Lens Color

0	No Pilot Light
G	Green (std)
R	Red
A	Amber
W	White

Strainer

N	No
S	Yes

Check Valve

0	None
1	w/CK-1
4	w/CK-4

Flange Availability & Weights

Table shows flange size codes available by flange type for each port size code

Port Code	Flange Connections Available						Weight					
	FPT (IPS)	Socket Weld (IPS) Weld Neck (IPS)	ODS (US)	DIN Weld Neck	Insert Metric	EC-Br Copper	Regulator		w/Flanges		w/Str. & Flg.	
							kg	lb	kg	lb	kg	lb
020	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	9.1	20	10	22	14	29
025	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	9.1	20	10	22	14	29
032	10 12	10 12	11 13 17	32 40 50		30 36 42	13	28	14	31	21	46
040	12 16	12 16	13 17 21	40 50			28	62	31	68	45	100
050	12 16	12 16	13 17 21	40 50			28	62	31	68	45	100
065		20	21 25	65 75			34	75	39	85	65	144
075		24	25 29	75			47	104	54	120	81	179
100		32	33	A0			72	159	80	177	132	291

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

Weld End Regulators, 125-200mm (5" - 8")

These heavy duty, cast steel bodied pressure regulators weld directly in the line and do not require flanges. As with the flanged body regulators, they are pilot operated and use the same modules to configure many variations.

These valves can be ordered with the R/S strainer to be welded directly to the inlet of any regulator.

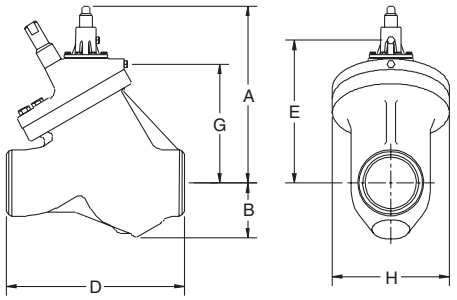
Dimensions

NOTE:

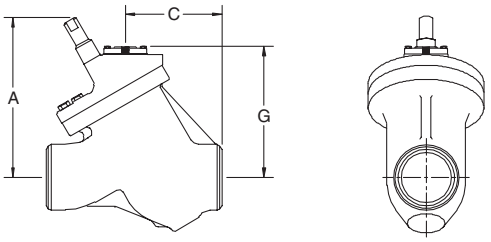
Allow 75mm (3") overhead clearance for access to adjusting stem.

Allow 100mm (4") overhead clearance for coil or seal cap removal.

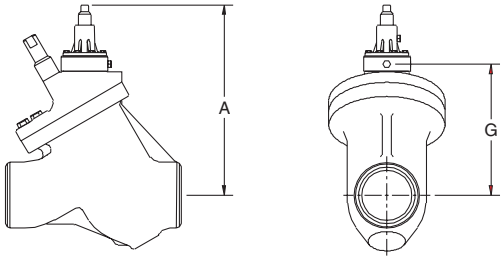
A4
A4E
A4P



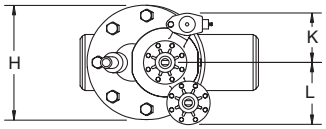
A4R

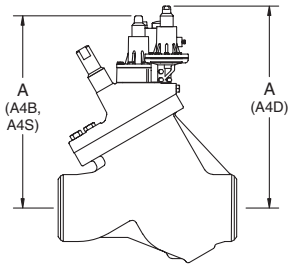


A4OE



A4B
A4S
A4D





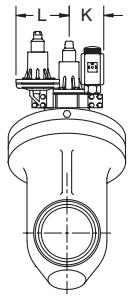


TABLE OF DIMENSIONS							
		125 (5")		150 (6")		200 (8")	
DIMENSIONS	TYPE	mm	inches	mm	inches	mm	inches
A	A4, A4E, A4P	438	17.25	514	20.25	572	22.50
	A4R	414	16.25	489	19.25	546	21.50
	A4S, A4B	476	18.75	552	21.75	610	24.00
	A4D	502	19.75	578	22.75	635	25.00
	A4OE	463	18.25	539	21.25	597	23.50
B		114	4.50	152	6.00	197	7.750
C		190	7.50	254	10.00	356	14.00
D		381	15.00	483	19.00	622	24.50
E		318	12.50	394	15.50	451	17.75
F		273	10.75	349	13.75	406	16.00
G		305	12.00	381	15.00	438	17.25
H		267	10.50	318	12.50	381	15.00
K		100	4.00	100	4.00	100	4.00
L		140	5.50	140	5.50	140	5.50

How to Order Weld End Regulators

Regulators can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Variation	Range	Gauge	Gauge Valve	LPD/ Low Limit Regulator	Coil Voltage, Style	Pilot Light	Lens Color	Strainer
150	A4	BS	A	A2	A	0	21	0	0	S

Port Size

125	125mm (5")
150	150mm (6")
200	200mm (8")

Variation (For a differential regulator, use variation "P")

Blank	Basic Inlet Regulator
B	Electric Wide Opening
S	Electric Shut-Off
BS	Electric Wide Opening & Shut-Off
D	Dual Pressure
E	Externally Equalized
K	Reseating Relief
BK	Electric Wide Opening & Reseating Relief
M	Electrically Compensated
MS	Electrically Compensated with Electric Shut-Off
BM	Electrically Compensated with Electric Wide Open
DM	Dual Pressure, Electrically Compensated
P	1:1 Pressure Compensated
PB	1:1 Compensation and Electric Wide Opening
PS	1:1 Compensation and Electric Shut-Off
3P	3:1 Pressure Compensated
R	Main Regulator only (Order Remote Pilot Separately)
T	Temperature Compensated
Z	Basic Inlet Regulator with Modudapter® and Two Moduplates®
OE	Basic Outlet Regulator
OES	Outlet Regulator with Electric Shut-Off

Motor Style (for M, MS, BM and DM only)

H	Motor Hardware Only
	Honeywell Motors
1	24V 50/60Hz Std. Cam, 120V Transformer
A	Option 1 with 240V Transformer
2	24V 50/60Hz Low Rise Cam, 120V Transformer
B	Option 2 with 240V Transformer
3	4-20 mA, 120V 50/60Hz Standard Cam
4	4-20 mA, 120V 50/60Hz Low Rise Cam
5	4-20 mA, 240V 50/60Hz Standard Cam
6	220V 50Hz Std. Cam
7	220V 50Hz Low Rise Cam
	Penn Motors
8	24V 50/60Hz Std. Cam, 120V Transformer
C	Option 8 with 240V Transformer
9	24V 50/60Hz Low Rise Cam, 120V Transformer
D	Option 9 with 240V Transformer

Gauge Size, Range, Type

0	No Gauge
A	2½" Low Pressure, English
B	3½" Low Pressure, English
C	2½" High Pressure, English
D	3½" High Pressure, English
E	2½" Low Pressure, Metric
F	3½" Low Pressure, Metric
G	2½" High Pressure, Metric
H	3½" High Pressure, Metric

Refrigerant

0	No Gauge
7	R-717
1	R-134a
2	R-22
4	R-404A
5	R-507

Pressure Range*

A**	0-10.3 Bar (0-150 PSIG)
D	5.2-19.3 Bar (75-280 PSIG)
V	500mm Hg to 8.3 Bar (20 in Hg to 120 PSIG)
0	No Range (A4R only)

Temperature Range ("T" Variation only)

1	Low Temperature: -30° to +30°C (-20° to +80°F)
2	High Temperature: +20° to +60°C (+60° to +140°F)

* Dual pressure regulators ("D" variations) require a range for each pilot regulator, i.e. AD (low/high).

** Not available for outlet regulators.

Body

N	No Valve
A	1/4" Angle Body

Low Pressure Drop (Variations B, S, BS, D, P, 3P, PB, PS, OE, OES only)

0	No LPD
1	With LPD

Low Limit Regulator (Variation T only)

0	No Low Limit Reg.
1	With Low Limit Reg.

Coil Voltage

0	No Coil
	Standard
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
	Non-Standard
A	24/60
C	480/60
D	24/50
F	48/50
H	24V DC
K	48V DC
W	120V DC

Coil Style ★

0	No Coil or Housing
1	Encapsulated w/36" Leads
L*	Encapsulated w/36" Leads & Pilot Light
2	Encapsulated w/DIN Connector
D*	Encapsulated w/DIN Connector & Pilot Light
5	Explosion Proof
8	Compact C,D Operator w/18" Leads
9	Compact C,D Operator w/DIN Connector

★ See page 30 for available coils by voltage.

* Integral pilot light. Lens color designated separately

Remote Pilot Light▲

0	None
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

▲ With coils 1 & 8 only. See table on page 30 for voltages.

Lens Color

0	No Pilot Light
G	Green (std)
R	Red
A	Amber
W	White

Strainer?

N	No
S	Yes

Weights

Port Code	Less Strainer kg	Less Strainer lb	w/Strainer kg	w/Strainer lb
125	54	120	99	220
150	98	215	176	390
200	159	350	294	650

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A2D Modular Pressure Pilot

Adds dual (D) variation when combined with Modular Solenoid Pilot (below). Provides a second higher control pressure.

Furnished with bolts and O-rings.

Mounts to Modudapter®. Same for all regulator sizes.

Type

A2D

Type	
A2D2	Use with 20-50mm (¾" to 2") Size A4
A2D	Use with 65-200mm (2½" to 8") Size A4

Range

A

Range	
A	0-10.3 Bar (0-150 PSIG)
D	5.2-19.3 Bar (75-280 PSIG)
V	500mm Hg to 8.3 Bar (20 in Hg to 120 PSIG)

S6A Modular Solenoid Pilot

Adds electric shut-off (S) or electric wide opening (B) and is used with Modular Pressure Pilot A2D for dual (D) variations. Uses Class "B" coil.

Furnished with bolts and O-rings.

Mounts to Modudapter®. Same for all regulator sizes.

Type

S6A

Volts/Frequency, Coil Style

1L

Volts/Frequency★			
0	No Coil		
	Standard		**Non-Standard**
1	120/60	**A**	24/60
R	120/6/60	**C**	480/60
2	208/60	**D**	24/50
S	208/6/60	**F**	48/50
3	240/60	**H**	24V DC
T	240/6/60	**K**	48V DC
6	115/50	**W**	120V DC
7	230/50		
8	240/50		

★ See page 30 for available coil/voltage combinations.

Coil Style	
0	No Coil or Housing
1	Encapsulated w/36" Leads
L*	Encapsulated w/36" Leads & Pilot Light
2	Encapsulated w/DIN Connector
D*	Encapsulated w/DIN Connector & Pilot Light

* Integral pilot light. Order lens color separately

Remote Pilot Light

0

Remote Pilot Light▲	
0	None
1	PLT-1 (NEMA1)
2	PLT-2 (NEMA4)
5	PLT-5

Lens Color

G

Lens Color	
0	No Pilot Light
G	Green
R	Red
A	Amber
W	White

▲ With coil 1 only. See page 30 for voltages.

S6B Compact Modular Solenoid Pilot

Adds electric shut-off (S) or electric wide opening (B) and is used with Modular Pressure Pilot A2D for dual (D) variations. Uses Class "H" coil.

Furnished with bolts and O-rings.

Mounts to Modudapter®. Same for all regulator sizes.

Type

S6B

Coil Style, Volts/Frequency

81

Volts/Frequency	
0	No Coil
	Standard
1	120/60
2	208/60
3	240/60
6	115/50
7	230/50
8	240/50

Coil Style	
0	No Coil or Housing
8	Compact C,D Operator w/18" Leads
9	Compact C,D Operator w/DIN Connector

Remote Pilot Light

0

Remote Pilot Light▲	
0	None
5	PLT-5

▲ With coil 8 only. See page 30 for voltages.

Lens Color

0

Lens Color	
0	No Pilot Light
G	Green (std)
R	Red
A	Amber
W	White

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Modudapter®(MD, SMD)

The special adapter to which the modular solenoid pilot, modular pressure pilot and Moduplate are bolted.

The **Series Modudapter (SMD)** is used with special regulators such as A4DS, A4BDS, etc.

Furnished with bolts and gaskets. (Standard part of regulators with S, B, D and Z variations)

NOTE:
Use SMD65 for all 125-200mm (5" - 8") A4 regulators.

Type	Use with Regulator Size	Part Number
MD25	20-25mm (¾"-1")	200591
MD32	32mm (1¼")	200593
MD50	40-50mm (1⅝"-2")	200595
MD65	65mm (2½")	200597
MD75	75mm (3")	200599
MD100	100mm (4")	200606
Series Modudapter®		
SMD65	20-65mm (¾"-2½") 125-200mm (5" - 8")	200564
SMD100	75-100mm (3"-4")	200566

Moduplate®(MP)

Provides blankoff or cross-over of pilot circuit on Type A4S or Type A4B.

Attaches to Modudapter. Same for all regulator sizes.

Furnished with bolts and three O-rings.

To order, specify Part # 200518.

Vacuum Cartridge (VC)

A pilot seat with vacuum range cartridge. Will change A range A4, A2B or A2D to vacuum range: 500mm Hg to 8.3 bar (20 in Hg to 120 PSIG).

Same for all regulator sizes.

Furnished with diaphragm and necessary gasket.

To order, specify Part # 202004.

Outlet Regulator Kit (OR)

An auxiliary adapter which converts A4 inlet regulators to outlet regulators with OE variation.

Furnished with all internal parts, bolts and gaskets.

Use with Port Sizes	Part Number
20-50mm (¾"- 2")	200516
65-200mm (2½"- 8")	200517

Pressure Bonnet Kit (PK)

Converts any A4, A4O or A2 Series regulator to 1:1 Pressure Compensation (P) variation . Standard in A range. Use with Type VC vacuum cartridge for V range.

Also available 3:1 pressure compensation (3P) variation.

Furnished with ¼" FPT bonnet connection for air or refrigerant pressure, bolts and gaskets. 3:1 kit includes above plus auxiliary adapter.

Same for all port sizes.

Type	Part Number
PK1 (1:1)	200520
PK3 (3:1)	200519

Temperature Bonnet Kit (TB)

Converts to temperature operated (T and OT) variation any A4 regulator.

Low range: -30° to 30°C (-20° to 80°F)
High range: 20° to 60°C (60° to 140°F)

Furnished as complete bonnet assembly including 15.9 x 133.4mm (5/8" x 3¼") bulb, 6m (20 ft.) capillary, bolts, gaskets and O-rings. Consult factory for 33' capillary.

Kit for A4OT (¾" to 4" only) includes tubing assembly for downstream connection.

Direct Acting (Cooling)

Use with Port Sizes	Part # Low Range	Part # High Range
20-50mm (¾"-2")	200622	202098
65-200mm (2½"-8")	200624	202097

Reverse Acting (Heating)

Use with Port Sizes	Part # Low Range	Part # High Range
20-200mm (¾"-8")	202096	202099

Motor Bonnet Kit (MB)

Converts to electric compensation (M) variation any A4 Series regulator. Standard in A range. Combine with VC vacuum cartridge for V range.

Furnished with bonnet, all internal parts, cam, bolts, gaskets, motor and transformer with 24 Volt secondary to operate motor.

Same for all ports.

Type	Motor Style
MB	3

Motor Style	
H	Motor Hardware Only
	Honeywell Motors
1	24V 50/60Hz Std. Cam with 120V Transformer
A	24V 50/60Hz Std. Cam with 240V Transformer
2	24V 50/60Hz Low Rise Cam with 120V Transformer
B	24V 50/60Hz Low Rise Cam with 240V Transformer
3	4-20 mA, 120V 50/60Hz Standard Cam
4	4-20 mA, 120V 50/60Hz Low Rise Cam
5	4-20 mA, 240V 50/60Hz Standard Cam
6	220V 50Hz Standard Cam
7	220V 50Hz Low Rise Cam
	Penn Motors
8	24V 50/60Hz Std. Cam with 120V Transformer
C	24V 50/60Hz Std. Cam with 240V Transformer
9	24V 50/60Hz Low Rise Cam with 120V Transformer
D	24V 50/60Hz Low Rise Cam with 240V Transformer

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Electric Proportioning Thermostat (T27)

Use with "M" variation regulators.

Specifications:

Range ..... -34° to 21°C (-30° to 70°F)
Capillary ..... 1.5m (5') standard
Bulb ..... 12.7mm dia. x 106mm long (½" dia. x 4 3/16" long)
Sensitivity adjustable ..... 1.7° to 16.7°C (3° to 30°F)
Various electronic controllers available

To order, specify Part # 301808.

Well, Separable

For use with T27 Thermostat
Stainless steel, 3/8" x 5"

For use with temperature operated valves (A4T)
Stainless steel, 5/8" x 3"

Type	Part Number
For T27	301800
For Temperature Operated Valves	203237

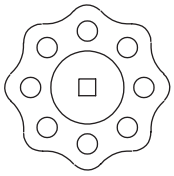
Defrost Timer (T31)

- U.L. listed
- Adjustable for defrost in 3-hour multiples
- Separate adjustable pump down cycle
- Separate adjustable fan delay cycle
- Contact ratings 10 amps
- Standard NEMA-3 housing

Type	Part Number
115V 60Hz	301805
208-240V 60Hz (Paragon #632)	301806

Handwheel

2½" diameter zinc stem handle. For regulator adjusting stem operation.



To order, specify Part # 302111.

Flange Ring-Tube Kits (FRT)

Use with "L" and "O" variation regulators

Close couples to the valve outlet. Eliminates the need for field piping.

Body Size	Part # Straight (A4O/A4L)	Part # Elbow (A4OT)
20-25mm (¾" - 1")	200439	200451
32mm (1¼")	200441	200453
40-50mm (1⅝" - 2")	200443	200455
65mm (2½")	200445	200457
75mm (3")	200447	200459
100mm (4")	200449	200461

Class 'B"Coil (S6A)

The molded water resistant Class "B" solenoid coil, available on most Refrigerating Specialties solenoid valves, is designed for long life and powerful opening force. The standard coil housing meets NEMA 3R and 4 requirements. This sealed construction can withstand direct contact with moisture and ice. The coil housing far exceeds the requirements of NEMA Standard ICS.1-110.57 salt spray test for rust resistance.

By definition, Class "B" coil construction will permit coil temperatures, as measured by resistance method, as high as 130°C (266°F). Final coil temperatures are a function of both fluid and ambient temperatures. The higher fluid temperatures require lower ambient temperatures so the maximum coil temperature is not exceeded. Conversely, low fluid temperatures permit higher ambient temperatures.

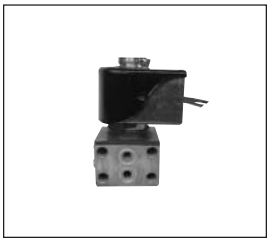
The supply circuits must be properly sized to give adequate voltage at the coil even when other electrical equipment is operating. The coil is designed to operate with line voltage from 85% to 110% of rated coil voltage. Power consumption during normal operation will be 33 watts or less.

Standard Encapsulated Coils

Volts/Hertz	Leads	Inrush Current (Amps)	Holding Current (Amps)	Fuse Size (Amps)
120/60	Blue	1.18	0.46	1
208/60	Blue and Red	0.63	0.26	1
240/60	Red	0.60	0.23	1
115/50	Yellow and Blue	1.22	0.21	1
230/50	Yellow	0.65	0.26	1

For other voltages, contact factory. On transformer coil, the 6 volt leads are always black.

Class 'H"Coil (S6B)



The Refrigerating Specialties Division molded water resistant Class "H" coil is designed for long life and powerful opening force. The Class "H" coil construction will permit coil temperatures, as measured by resistance method, as high as 180°C (365°F).

The supply circuits must be properly sized to give adequate voltage at the coil leads even when other electrical equipment is operating. The coil is designed to operate at 15% under voltage. Operating with line voltage below the limit will result in lowering the valve opening pressure differential.

Currents

Coil Type	Watt Rating	Volt Amperage	
		Holding	Inrush
Standard AC Class 'H"	10.5	23	37
Standard AC Coil with 6v Secondary Pilot Light	11.0	26	38

Voltages

Coils are available from stock with most standard voltages (see table below). Non-standard voltages (shown in the shaded area of table) are available as special order. Coils are also available with 6V secondary voltage for use with remote pilot lights PLT-1 and PLT-2. Consult factory for other voltages.

NOTE: Pilot lights cannot be used with explosion proof or unleaded coils.

Available Voltages for Coils and Pilot Lights	Code	Class	120/60	120/6/60	208/60	208/6/60	240/60	240/6/60	115/50	230/50	240/50	24/60	480/60	24/50	48/50	24VDC	48VDC	120VDC
Encapsulated w/Leads	1	B	●	●	●	●	●	●	●	●	●	●		●	●			
Encapsulated w/Leads & Integral Pilot Light	L	B	●		●		●			●								
Encapsulated w/DIN Connector	2	B	●				●		●	●	●						●	
Encapsulated w/DIN & Integral Pilot Light	D	B	●				●		●	●	●							
Explosion Proof	5	—	●		●		●		●	●		●	●			●		●
Compact C,D Operator w/Leads	8	H	●		●		●		●	●	●							
Compact C,D Operator w/DIN Connector	9	H	●		●		●		●	●	●							
PLT-1 (NEMA 1)				●		●		●										
PLT-2 (NEMA 4)				●		●		●										
PLT-5 (NEMA 4)			●		●		●											

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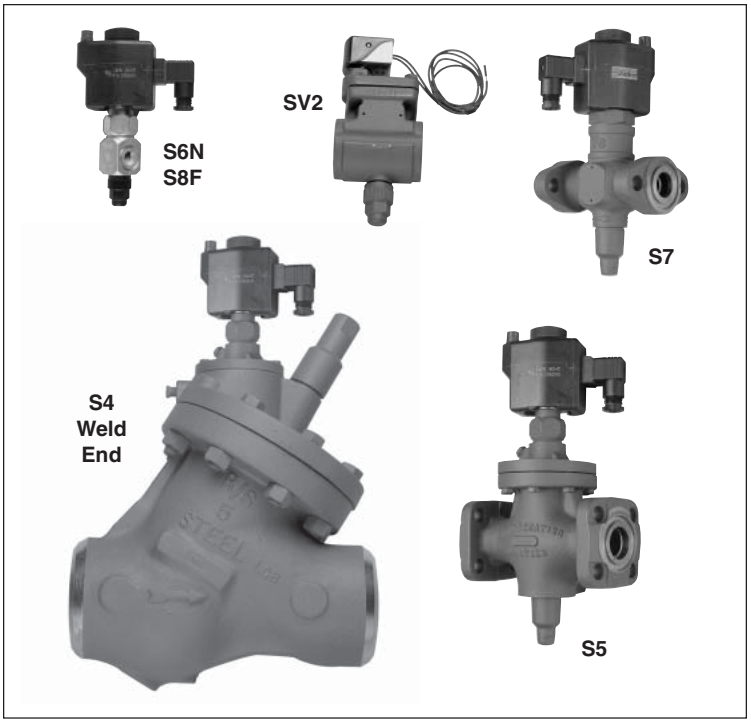
Solenoid Valves

The Refrigerating Specialties family of solenoid valves includes direct operated and pilot operated valves. Selections for most refrigeration applications are available – liquid, suction, hot gas and compressor unloading. Low or no pressure differential, equalizing and vent solenoid in sizes up to 50mm (2").

Explosion proof SV2X and S4X hazardous environment type solenoids carry NEMA Type 4 and 7 classification.

Coils are stocked in standard voltages. Non-standard voltages may be special ordered. See table on page 48 or consult factory.



Common Specifications

Design Pressure (MRP) ..... 27.6 Bar (400 psig)
SV2 only ..... 31.0 Bar (450 psig)
Maximum Fluid Temperature ..... 105°C (220°F)
Standard Coil Housing ..... NEMA 3R and 4
Explosion Proof Housing ..... NEMA Type 4 and 7

Specifications

Type		S6N	S8F	S7	SV2	S5	S5	S4	S4	S4
Port Size	mm	5	13	20-25	13-32	32	40-75	20-32	40-100	125-200
	inch	3⁄16"	½"	¾" - 1"	½" - 1¼"	1¼"	1⅝" - 3"	¾" - 1¼"	1⅝" - 4"	5" - 8"
Seat Material		PTFE	PTFE	PTFE	PTFE	PTFE	Metal	PTFE	Metal	Metal
Body Material		Ductile Iron	Ductile Iron	Gray Iron	Ductile Iron	Gray Iron	Gray Iron	Gray Iron	Gray Iron	Cast Steel
Minimum Pressure Drop to Open Wide	bar	0	0.7	0	.24	0.07	0.07	0.14	0.28	0.14
	psi	0	1	0	3.5	1	1	4	2	2
Minimum Fluid Temperature	°C	-50°	-50°	-30°	-45°	-30°	-30°	-45°	-50°	-50°
	°F	-60°	-60°	-25°	-50°	-25°	-25°	-50°	-60°	-60°
Operation		Direct Operated	Spring Closing	Electrically Held Open	Spring Closing	Gravity Closing	Gravity Closing	Spring Closing	Spring Closing	Spring Closing
Bulletin for Reference		30-90	30-91	30-92	30-06	30-93	30-93	30-94	30-94	30-05

Selection Guide

Valve Type	Refrigerant Application	Refrigerant Temperature Range	VALVE MOST RECOMMENDED –Listed by Port Size										
			5mm	13mm	20mm	25mm	32mm	40mm	50mm	65mm	75mm	100mm	125-200mm
			3⁄16"	½	¾	1"	1¼	1	5⁄8"	2"	2½	3"	4"	5"- 8"
Solenoid	Liquid	Conventional warm high pressure	S6N	S8F SV2	S4 SV2	S4 SV2	S4 SV2	S4	S4	S4	S4	S4	S4
		Above -50°C (-60°F)	S6N	S8F	—	—	—	S4	S4	S4	S4	S4	S4
		Above -45°C (-50°F)	S6N	S8F SV2	S4 SV2	S4 SV2	S4 SV2	S4	S4	S4	S4	S4	S4
	Suction*	Above -30°C (-25°F)	S6N	S8F	S7	S7	S5	S5	S5	S5	S5	S4	S4
Solenoid	Hot Gas Defrost	Below 105°C (220°F)	S6N	S8F SV2	S4 SV2	S4 SV2	S4 SV2	S4	S4	S4	S4	S4	S4
	Bypass Compressor Unloading	Below 105°C (220°F)	S6N	S8F	S7	S7	S4E	S4E	S4E	S4E	S4E	S4E	—

*Also see Gas Powered Suction Valves.

- Coil Housing Surpasses NEMA Salt Spray Test
- Accepts Either Open Frame or Totally Encapsulated Coils
- Direct Acting, Normally Closed Operation
- Replaceable Teflon Seat
- Manual Opening Stem
- Stainless Steel Needle
- Pilot Light Available
- Maximum Opening Pressure Difference (MOPD) is 20.7 Bar (300 psi)

Description

This compact, heavy duty, direct-acting solenoid valve is suitable for industrial refrigerants for liquid lines, refrigerant oil lines, and as a pilot valve to actuate remote gas powered valves and other pilot actuated devices. The plunger-needle assembly is also used with most other Refrigerating Specialties industrial solenoid valves. This valve is usually ordered with a close-coupled stainless steel screen strainer. (See page 90 for strainer information).

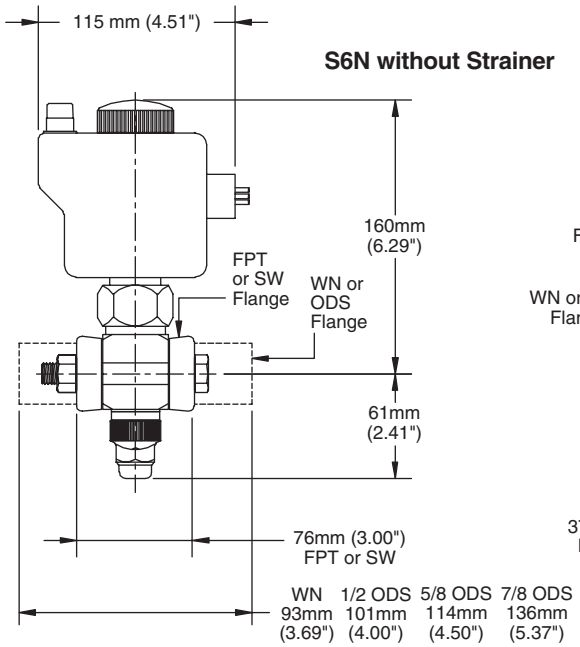
Materials

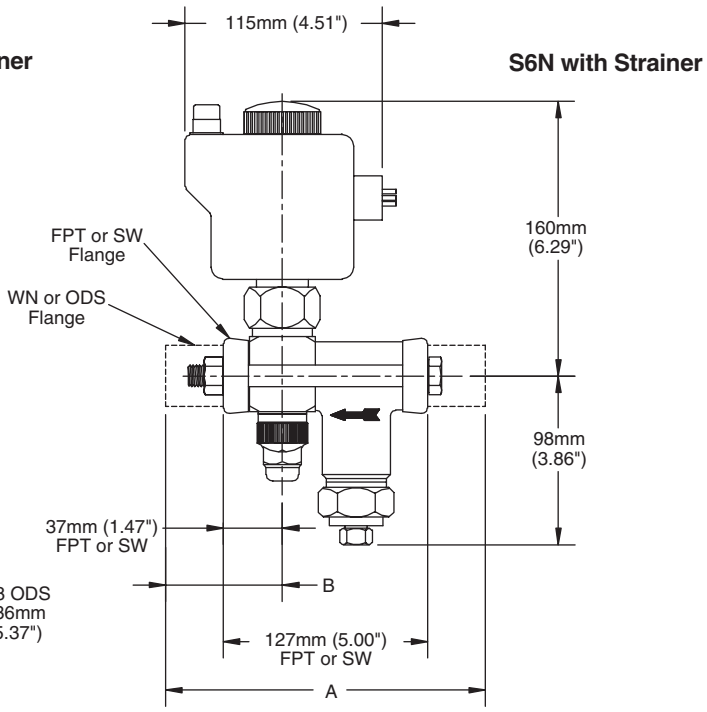
Body ..... Plated Ductile Iron
Seat ..... PTFE
Needle ..... Stainless Steel

Specifications

Minimum Pressure Drop
to Open Wide ..... 0 bar (0 PSI)
Minimum Fluid Temperature ..... -50°C (-60°F)
Coil (See page 48) ..... Class “B” Housing
Flow Coefficient ..... 0.5 Kv (0.6 Cv)

Dimensions





	Flange	1/2 ODS	5/8 ODS	7/8 ODS
A	144mm (5.69")	152mm (6.00")	165mm (6.50")	187mm (7.37")
B	46mm (1.81")	50mm (1.97")	56mm (2.22")	67mm (2.66")

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How to Order

Type S6N solenoid valves can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Inlet Flange	Outlet Flange	Coil Voltage, Style	Pilot Light	Lens Color	Strainer	Check Valve
005	S6N	F04	F04	12	0	0	S	4

Port Size

005	5mm (3/16")

Flange Type / Connection

Flange Type		Connection	
X	Less Flanges	**00**	None
F	FPT (IPS)	**02▲**	1/4"
S	SW (IPS)	**03**	3/8"
W	WN (IPS)	**04**	1/2"
		06	3/4"
K	ODS (US)	**04**	1/2"
		05	5/8"
		07	7/8"

▲ FPT only

Coil Voltage

0	No Coil
Standard	
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
Non-Standard	
A	24/60
D	24/50
F	48/50
K	48 V DC

Coil Style ★

0	No Coil or Housing
1	Encapsulated w/36" Leads
L*	Encapsulated w/36" Leads & Pilot Light
2	Encapsulated w/DIN Connector
D*	Encapsulated w/DIN Connector & Pilot Light

★ See page 48 for available coil style/voltage combinations.

* Integral pilot light. Lens color designated separately

Remote Pilot Light ◆

0	None
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

◆ With coil style 1 only. See page 48 for voltages.

Lens Color

0	No Remote Light
G	Green (std)
R	Red
A	Amber
W	White

Strainer

N	No Strainer
S	w/Strainer

Check Valve

0	None
4	w/CK4

⚠ **WARNING!**
ODS flanges not suitable for use with ammonia.

Weight:

Less Strainer ..... 2.5 kg (5 lbs)
With Strainer ..... 3.3 kg (7 lbs)

- Coil Housing Surpasses NEMA Salt Spray Test
- Accepts Either Open Frame or Totally Encapsulated Coils
- Replaceable Piston Plug Assembly
- Stainless Steel Needle
- Pilot Light Available
- Manual Opening Stem
- Maximum Opening Pressure Difference (MOPD) is 20.7 Bar (300 psi)

Description

This compact, heavy duty, pilot-operated solenoid valve is suitable for industrial refrigeration for liquid, suction and hot gas lines, and refrigerant oil lines. The plunger-needle assembly is also used with most other Refrigerating Specialties industrial solenoid valves. This valve is usually ordered with a close-coupled stainless steel screen strainer. (See page 90 for strainer information).

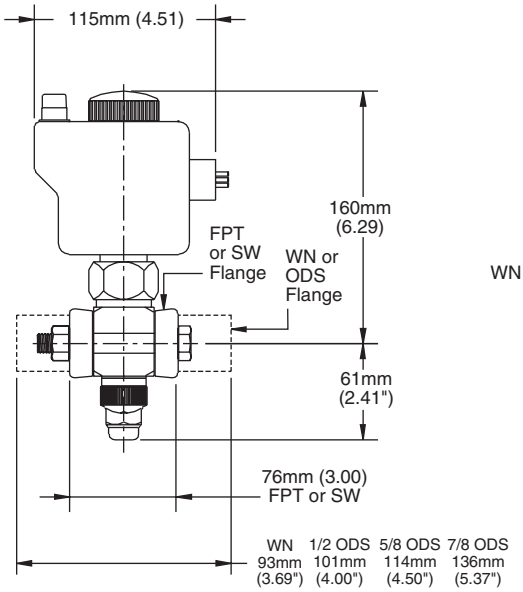
Materials

Body ..... Plated Ductile Iron
Seat ..... PTFE
Needle ..... Stainless Steel

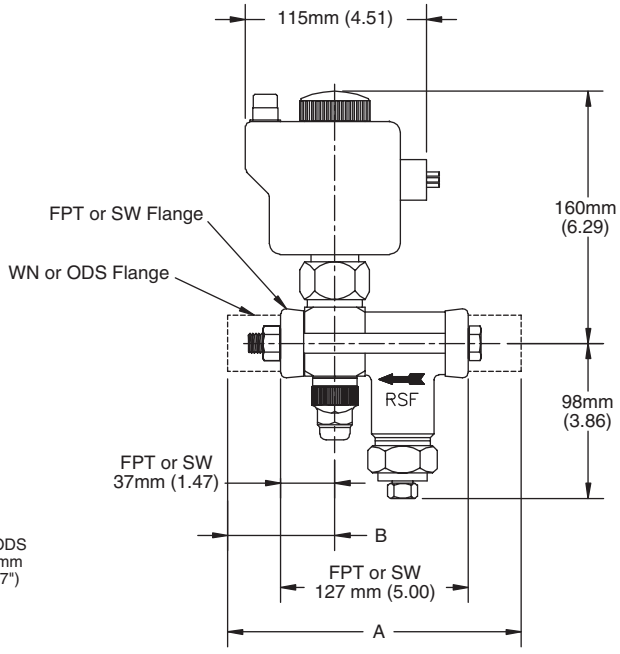
Specifications

Minimum Pressure Drop
to Open Wide ..... 0.7 bar (1 PSI)
Minimum Fluid Temperature ..... -50°C (-60°F)
Coil (see page 48) ..... Class “B” Housing
Flow Coefficient: ..... 2.3 Kv (2.7 Cv)

Dimensions



S8F without Strainer



S8F with Strainer

	Flange	1/2 ODS	5/8 ODS	7/8 ODS
A	144mm (5.69")	152mm (6.00")	165mm (6.50")	187mm (7.37")
B	46mm (1.81")	50mm (1.97")	56mm (2.22")	67mm (2.66")

Parker Climate & Industrial Controls

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Refrigerating Specialties Division
Broadview, IL 60155 USA

How to Order

Type S8F solenoid valves can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Inlet Flange	Outlet Flange	Coil Voltage, Style	Pilot Light	Lens Color	Strainer	Check Valve
013	S8F	F04	F04	R1	2	G	S	0

Port Size

013	13mm (½")

Flange Type / Connection

Flange Type		Connection	
X	Less Flanges	**00**	None
F	FPT (IPS)	**02▲**	1/4"
S	SW (IPS)	**03**	3/8"
W	Weld Neck (IPS)	**04**	1/2"
		06	3/4"
K	ODS (US)	**04**	1/2"
		05	5/8"
		07	7/8"
D	DIN Weld Neck	**10**	10mm
		15	15mm
		20	20mm

▲ FPT only.

Coil Voltage★

0	No Coil
	Standard
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
	Non-Standard
A	24/60
D	24/50
F	48/50
K	48V DC

★ See table on page 48 for available coil style/voltage combinations.

Coil Style

0	No Coil or Housing
1	Encapsulated w/36" Leads
L*	Encapsulated w/36" Leads & Pilot Light
2	Encapsulated w/DIN Connector
D*	Encapsulated w/DIN Connector & Pilot Light

* Integral pilot light. Lens color designated separately

Check Valve

0	None
4	w/CK4

Strainer

N	No Strainer
S	w/Strainer

Lens Color

0	No Remote Light
G	Green (std)
R	Red
A	Amber
W	White

Remote Pilot Light◆

0	None
1	PLT-1 (NEMA 1)
2	PLT-2(NEMA 4)
5	PLT-5

◆ With coil style 1 only. See page 48 for voltages.

⚠ WARNING!
ODS flanges not suitable for use with ammonia.

Weight:

Less Strainer ..... 2.5 kg (5 lbs)
With Strainer ..... 3.3 kg (7 lbs)

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- Pilot Operated
- Molded Class “H” Coil Construction
- Pilot Light Available
- Manual Opening Stem
- MOPD 20.7 bar (300 PSIG); MRP 31.0 bar (450 PSIG)
- All Service from the Top

Description

This compact, heavy duty, pilot-operated solenoid valve is suitable for ammonia and other common refrigerants, certain oils and other fluids approved for use in refrigeration. This valve may be opened by means of a manual opening stem for servicing or in case of electrical power failure. The valve can be ordered with a close-coupled stainless steel screen strainer (see page 90).

The Type SV2 valve is available with an optional extension tube to raise the solenoid operator and coil housing assembly 50mm (2”) above the valve body to accommodate insulation. When the option is desired, the Type SV2A solenoid valve should be specified.

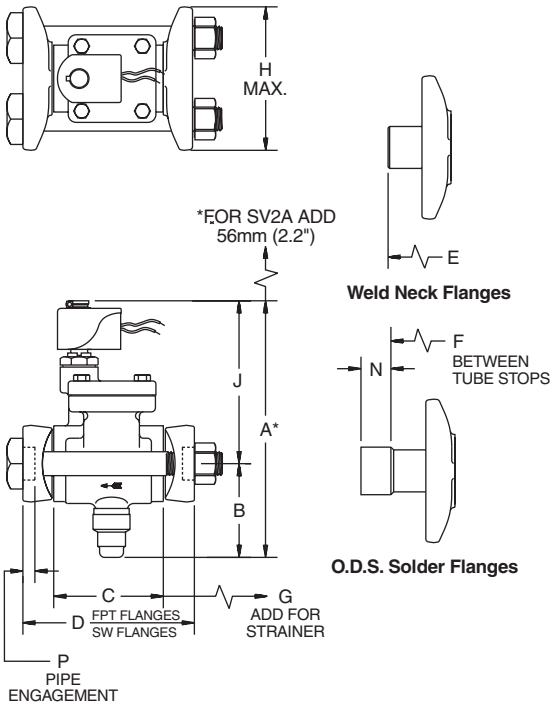
Materials

Body ..... Ductile Iron
Seat ..... PTFE
Needle ..... Stainless Steel

Specifications

Minimum Pressure Drop to Open Wide .. .24 bar (3.5 PSI)
Minimum Fluid Temperature ..... -45°C (-50°F)
Coil (see page 48) ..... Class “H” Housing
Flow Coefficients:
13 mm (½”) ..... 2.6 Kv (3.0 Cv)
20 mm (¾”) ..... 6.0 Kv (7.0 Cv)
25 mm (1”) ..... 10.3 Kv (12.0 Cv)
32 mm (1¼”) ..... 16.3 Kv (19.0 Cv)

Dimensions



Allow 38mm (1.5”) above valve for removal of coil housing assembly.
Allow 25mm (1”) below valve to operate manual opening stem.

Dimension		PORT SIZE								
		13mm (1/2’)			20mm & 25mm (3/4”& 1’)			32mm (1-1/4’)		
A*	mm	166			203			219		
	inch	6.56			8.00			8.62		
B	mm	59			79			89		
	inch	2.31			3.12			3.50		
C	mm	57			87			149		
	inch	2.25			3.43			5.87		
D (FPT,SW)	mm	95			146			203		
	inch	3.75			5.73			7.97		
								1-1/4		1-1/2
E (WN)	mm	113			192			246		251
	inch	4.44			7.53			9.67		9.87
		1/2	5/8	7/8	7/8	1-1/8	1-3/8	1-3/8	1-5/8	2-1/8
F (ODS)	mm	121	134	156	168			215	225	251
	inch	4.75	5.25	6.12	6.63			8.47	8.87	9.87
G	mm	50			99			178		
	inch	2.00			3.90			7.00		
H	mm	76			117			95		
	inch	3.00			4.60			3.75		
J*	mm	98			124			130		
	inch	3.87			4.87			5.12		
		1/2	5/8	7/8	7/8	1-1/8	1-3/8	1-3/8	1-5/8	2-1/8
N (ODS)	mm	10	13	20	20	24	25	25	28	34
	inch	0.37	0.50	0.75	0.75	0.93	1.00	1.00	1.09	1.34
P (SW)	mm	13			13			15		
	inch	0.50			0.50			0.60		

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How to Order

Type SV2 solenoid valves can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Variation	Inlet Flange	Outlet Flange	Coil Voltage, Style	Pilot Light	Lens Color	Strainer	Check Valve
020	SV2	A	F08	F08	12	1	G	S	1

Port Size

013	13mm (½")
020	20mm (¾")
025	25mm (1")
032	32mm (1¼")

Variation

Blank	Standard Valve
A	w/Extension Tube

Not all flange sizes are available for each port size. See Flange Availability table for allowable combinations.

Flange Type	Connection
X Less Flanges	**00** None
F FPT (IPS) **S** SW (IPS) **W** Weld Neck (IPS)	**02** ¼" **03** 3/8" **04** ½" **06** ¾" **08** 1" **10** 1¼" **12** 1½"
K ODS (US)	**04** ½" **05** 5/8" **07** 7/8" **09** 1 1/8" **11** 1 3/8" **13** 1 5/8" **17** 2 1/8"
D DIN Weld Neck **M** Insert Metric **C** EC-Br Copper	Enter size from table below.

*See table below for availability

⚠ WARNING!
ODS flanges not suitable for use with ammonia.

Coil Voltage

0	No Coil
	Standard
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
	Non-Standard
A	24/60
C	480/60
D	24/50
H	24V DC
W	120V DC

Coil Style★

0	No Coil
5	Explosion Proof
6	Compact A,B Operator w/18" Leads
7	Compact A,B Operator w/DIN Connector

★ See table on page 48 for available coil style/voltage combinations.

Remote Pilot Light

0	None
1	PLT-1(NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

◆ With coil style 6 only. See page 48 for voltages.

Lens Color

0	No Remote Light
G	Green (std)
R	Red
A	Amber
W	White

Strainer

N	No Strainer
S	w/Strainer

Check Valve

0	None
1*	w/CK1
4	w/CK4

* N/A on Size 013

Flange Availability & Weights

Table shows flange size codes available by flange type for each port size code

Port Code	Flange Connections Available						Weight			
	FPT (IPS)	Socket Weld (IPS) Weld Neck (IPS)	ODS (US)	DIN Weld Neck	Insert Metric	EC-Br Copper	Less Strainer		With Strainer	
							kg	lb	kg	lb
013	02 03 04 06	03 04 06	04 05 07	10 15 20			1.8	4	2.7	6
020	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	4.0	9	7.2	16
025	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	4.0	9	7.2	16
032	10 12	10 12	11 13 17	32 40 50		30 36 42	6.8	15	13.5	30

- Positive Lift, Held Open Electrically
- Standard Coil Housing Meets NEMA 3R and NEMA 4 – Rain Tight
- Coil Housing Surpasses NEMA Salt Spray Test
- Gray Iron Body, PTFE Seat
- Molded Class “B” Coil Construction
- Pilot Light Available
- Stainless Steel Needle
- Manual Opening Stem
- MRP 27.6 bar (400 PSIG)

Description

This heavy duty solenoid valve is suitable for ammonia and other common refrigerants, certain oils and other fluids approved for use in refrigeration. The S7 is a pilot operated, positive lift valve. The valve may be opened by means of a manual opening stem for servicing or in case of electrical power failure.

It is advisable to install a strainer upstream of each valve to prevent entrance of foreign material into the valves and the rest of the system. Refrigerating Specialties strainers are available to close-couple to valve inlets (see page 90).

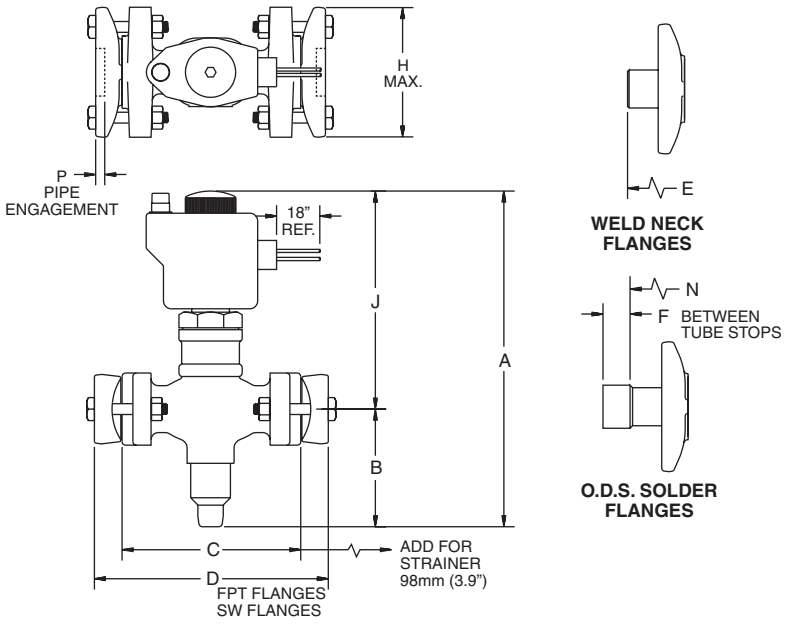
Materials

Body ..... Gray Iron
Seat ..... PTFE
Needle ..... Stainless Steel

Specifications

Minimum Pressure Drop
to Open Wide ..... 0 bar (0 PSI)
Minimum Fluid Temperature ..... -30°C (-25°F)
Coil (See page 48) ..... Class “B” Housing
Flow Coefficients:
20 mm (¾”) ..... 6.8 Kv (8.0 Cv)
25 mm (1”) ..... 8.6 Kv (10.0 Cv)

Dimensions



A		B		C		D (FPT, SW)		E (WN)		F (ODS)		H		J		N (ODS)		P (SW)	
MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH
282	11.1	102	4.0	157	6.2	216	8.5	261	10.3	239	9.4	117	4.6	180	7.1	25	1.0	13	0.5

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How to Order

Type S7 solenoid valves can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Inlet Flange	Outlet Flange	Coil Voltage, Style	Pilot Light	Lens Color	Strainer	Check Valve
020	S7	F08	F08	11	0	0	S	0

Port Size*

020	20mm (¾")
025	25mm (1")
050	50mm (2")

Not all flange types and sizes are available for each port size. See Flange Availability table for allowable combinations.

Flange Type	Connection
X Less Flanges	00 None
F FPT (IPS) S SW (IPS) W Weld Neck (IPS)	06 ¾" 08 1" 10 1¼" 12 1½" 16 2"
K ODS (US)	07 7/8" 09 1 1/8" 11 1 3/8" 13 1 5/8" 17 2 1/8" 21 2 5/8"
D DIN Weld Neck M Insert Metric C EC-Br Copper	Enter size from table below.

Coil Voltage

0	No Coil
Standard	
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
Non-Standard	
A	24/60
D	24/50
F	48/50
K	48V DC

Coil Style★

0	No Coil or Housing
1	Encapsulated w/36" Leads
L	Encapsulated w/36" Leads & Pilot Light*
2	Encapsulated w/DIN Connector
D	Encapsulated w/DIN Connector & Pilot Light*

★ See page 48 for available coil style/voltage combinations.
* Integral pilot light. Lens color designated separately.

Remote Pilot Light◆

0	None
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

◆ With coil style 1 only. See page 48 for voltages.

Lens Color

0	No Pilot Light
G	Green (std)
R	Red
A	Amber
W	White

Strainer

N	No Strainer
S	w/Strainer

Check Valve

0	None
1	w/CK1
4	w/CK4

⚠ WARNING!
ODS flanges not suitable for use with ammonia.

Flange Availability & Weights

Table shows flange size codes available by flange type for each port size code

Port Code	Flange Connections Available						Weight			
	FPT (IPS)	Socket Weld (IPS) Weld Neck (IPS)	ODS (US)	DIN Weld Neck	Insert Metric	EC-Br Copper	Less Strainer		With Strainer	
							kg	lb	kg	lb
020	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	5.8	12	9	19
025	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	5.8	12	9	19
050	12 16	12 16	13 17 21	40 50			29	63	43	95

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- Standard Coil Housing Meets NEMA 3R and NEMA 4 – Rain Tight
- Coil Housing Surpasses NEMA Salt Spray Test
- Replaceable Piston Plug Assembly
- Molded Class “B” Coil Construction
- Pilot Light Available
- Stainless Steel Needle
- Manual Opening Stem
- MOPD is 20.7 bar (300 PSIG); MRP is 27.6 bar (400 PSIG)

Description

This heavy duty, pilot-operated, gravity closing solenoid valve is suitable for ammonia and other common refrigerants, certain oils and other fluids approved for use in refrigeration. The valve may be opened by means of a manual opening stem for servicing or in case of electrical power failure. The valve can be ordered with a close-coupled stainless steel screen strainer (see page 90).

Materials

Body ..... Gray Iron

Seat:
- 32mm (1¼") ..... PTFE
- 40-75mm (1⅝" - 3") ..... Metal

Needle ..... Stainless Steel

Specifications

Minimum Pressure Drop to Open Wide ..... 0.07 bar (1 PSI)

Minimum Fluid Temperature ..... -30°C (-25°F)

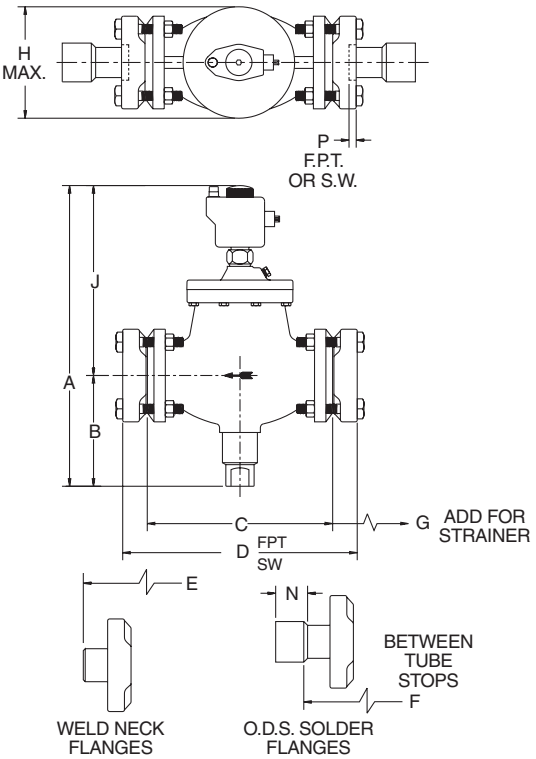
Coil (see page 48) ..... Class “B” Housing

External Connection for Outlet Pressure (S5E) ..... ¼” FPT

Flow Coefficients:
- 32mm (1¼") ..... 16.3 Kv (19.0 Cv)
- 40 mm (1⅝") ..... 31.7 Kv (37.0 Cv)
- 50 mm (2") ..... 43.7 Kv (51.0 Cv)
- 65mm (2½") ..... 70.7 Kv (82.0 Cv)
- 75mm (3") ..... 98.0 Kv (115 Cv)

Dimensions

Dimension		PORT SIZE									
		32mm (1-1/4’)			40 & 50mm (15/8 & 2’)			65mm (2-1/2’)		75mm (3’)	
A	mm	348			411			437		511	
	inch	13.7			16.2			17.2		20.1	
B	mm	117			127			137		198	
	inch	4.6			5.0			5.4		7.8	
C	mm	203			251			251		311	
	inch	8.0			9.9			9.9		12.2	
D (FPT,SW)	mm	256			307			331		289	
	inch	10.1			12.1			13.0		15.3	
		1-1/4		1-1/2	1-1/2		2				
E (WN)	mm	300		304	364		371	401		478	
	inch	11.8		12.0	14.3		14.6	15.8		18.8	
		1-3/8	1-5/8	2-1/8	1-5/8	2-1/8	2-5/8	2-5/8	3-1/8	3-1/8	3-5/8
F (ODS)	mm	269	279	304	358	338	358	348	389	414	432
	inch	10.6	11.0	12.0	14.1	13.3	14.1	13.7	15.3	16.3	17.0
G	mm	178			251			314		314	
	inch	7.0			9.9			12.4		12.4	
H	mm	117			140			159		176	
	inch	4.6			5.5			6.2		7.0	
J	mm	231			284			300		312	
	inch	9.1			11.2			11.8		12.3	
		1-3/8	1-5/8	2-1/8	1-5/8	2-1/8	2-5/8	2-5/8	3-1/8	3-1/8	3-5/8
N (ODS)	mm	25	28	33	28	33	38	38	43	43	48
	inch	1.0	1.1	1.3	1.1	1.3	1.5	1.5	1.7	1.7	1.9
		1-1/4		1-1/2	1-1/2		2				
P (SW)	mm	15		15	15		15	25		29	
	inch	0.6		0.6	0.6		0.6	1.0		1.1	



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How to Order

Type S5 solenoid valves can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Variation	Inlet Flange	Outlet Flange	Coil Voltage, Style	Pilot Light	Lens Color	Strainer	Check Valve
050	S5		F12	F12	11	0	0	S	0

Port Size

032	32mm (1¼")
040	40mm (1⅝")
050	50mm (2")
065	65mm (2½")
075	75mm (3")

Variation

Blank	Standard
E	External Actuating Pressure Supply

Not all flange types and sizes are available for each port size. See Flange Availability table for allowable combinations.

Flange Type	Connection
X Less Flanges	00 None
F FPT (IPS) S SW (IPS) W Weld Neck (IPS)	10 1¼" 12 1½" 16 2" 20 2½" 24 3"
K ODS (US)	11 1 3/8" 13 1 5/8" 17 2 1/8" 21 2 5/8" 25 3 1/8" 29 3 5/8"
D DIN Weld Neck M Insert Metric C EC-Br Copper	Enter size from table below.

⚠ WARNING!
ODS flanges not suitable for use with ammonia.

Coil Voltage

0	No Coil
Standard	
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
Non-Standard	
A	24/60
D	24/50
F	48/50
K	48V DC

Coil Style★

0	No Coil or Housing
1	Encapsulated w/36" Leads
L	Encapsulated w/36" Leads & Pilot Light*
2	Encapsulated w/DIN Connector
D	Encapsulated w/DIN Connector & Pilot Light*

★ See page 48 for available coil style/voltage combinations.
* Integral pilot light. Lens color designated separately

Remote Pilot Light◆

0	None
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

◆ With coil style 1 only. See page 48 for voltages.

Lens Color

0	No Pilot Light
G	Green (std)
R	Red
A	Amber
W	White

Strainer

N	No Strainer
S	w/Strainer

Check Valve

0	None
1	w/CK1
4	w/CK4

Flange Availability & Weights

Table shows flange size codes available by flange type for each port size code

Port Code	Flange Connections Available						Weight			
	FPT (IPS)	Socket Weld (IPS) Weld Neck (IPS)	ODS (US)	DIN Weld Neck	Insert Metric	EC-Br Copper	Less Strainer		With Strainer	
							kg	lb	kg	lb
032	10 12	10 12	11 13 17	32 40 50		30 36 42	14	30	21	46
040	12 16	12 16	13 17 21	40 50			29	63	43	95
050	12 16	12 16	13 17 21	40 50			29	63	43	95
065		20	21 25	65 75			37	81	64	140
075		24	25 29	75			53	116	80	175

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- Standard Coil Housing Meets NEMA 3R and NEMA 4 – Rain Tight
- Coil Housing Surpasses NEMA Salt Spray Test
- Molded Class “B” Coil Construction
- Pilot Light Available
- Stainless Steel Needle
- Manual Opening Stem
- MOPD is 20.7 bar (300 PSIG); MRP is 27.6 bar (400 PSIG)

Description

This heavy duty solenoid valve is suitable for ammonia and other common refrigerants, certain oils and other fluids approved for use in refrigeration. The S4 is a pilot operated valve that may be opened by means of the manual opening stem for servicing or in case of electrical power failure.

Materials

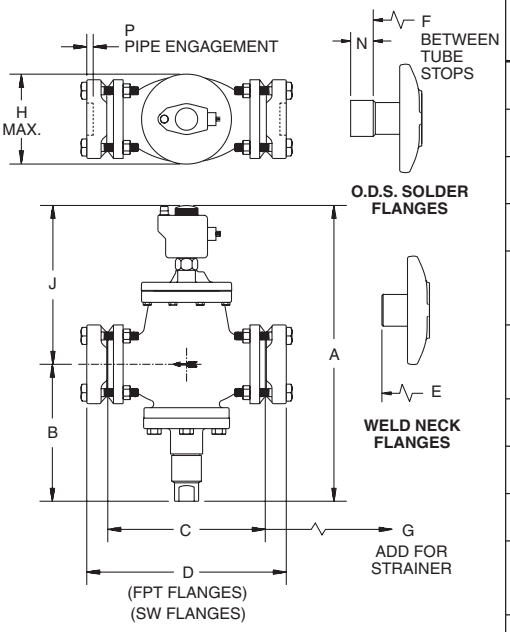
Body ..... Gray Iron
Seat ..... PTFE (13-32mm), Metal (40-100mm)
Needle ..... Stainless Steel

Specifications

Minimum Pressure Drop to Open Wide
20-32mm (¾" - 1¼") ..... 0.14 bar (2 PSI)
40-100mm (1⅝" - 4") ..... 0.28 bar (4 PSI)
Minimum Fluid Temperature
20-32mm (¾" - 1¼") ..... -45°C (-50°F)
40-100mm (1⅝" - 4") ..... -50°C (-60°F)
Coil (See page 48) ..... Class “B” Housing

Flow Coefficients:
20 mm (¾”) ..... 6.2 Kv (7.2 Cv)
25 mm (1”) ..... 8.6 Kv (10.0 Cv)
32mm (1¼”) ..... 15.0 Kv (17.5 Cv)
40 mm (1⅝”) ..... 28.6 Kv (33.4 Cv)
50 mm (2”) ..... 42.4 Kv (49.5 Cv)
65 mm (2½”) ..... 59.9 Kv (70.0 Cv)
75 mm (3”) ..... 86.0 Kv (100 Cv)
100 mm (4”) ..... 139 Kv (162 Cv)

Dimensions



Note: Allow 100mm (4") above valve for removal of coil housing and coil.

Dimension		PORT SIZE												
		20mm (3/4') & 25mm (1')	32mm (1-1/4')		40 & 50mm (1-5/8 & 2')			65mm (2-1/2')		75mm (3')		100mm (4')
A	mm	376	394		442			467		579		645
	inch	14.8	15.5		17.4			18.4		22.8		25.4
B	mm	148	162		177			181		273		292
	inch	5.8	6.3		6.9			7.1		10.7		11.5
C	mm	164	203		251			251		311		339
	inch	6.2	8.0		9.9			9.9		12.2		14.1
D	mm	216	256		307			331		389		450
(FPT,SW)	inch	8.5	10.1		12.1			13.0		15.3		17.7
			1¼	1½	1½	2						
E	mm	261	300	304	364	371		401		478		571
(WN)	inch	10.3	11.8	12.0	14.3	14.6		15.8		18.8		22.5
			1⅜	1⅝	2⅛	1⅝	2⅛	2⅝	2⅝	3⅛	3⅛	3⅝	
F	mm	239	269	279	304	358	338	358	348	389	414	432	303
(ODS)	inch	9.4	10.6	11.0	12.0	14.1	13.3	14.1	13.7	15.3	16.3	17.0	19.8
G	mm	98	178		251			314		314		363
	inch	3.9	7.0		9.9			12.4		12.4		14.3
H	mm	117	117		140			159		176		222
	inch	4.6	4.6		5.5			6.2		7.0		8.8
J	mm	224	231		284			300		312		353
	inch	8.8	9.1		11.2			11.8		12.3		13.9
			1⅜	1⅝	2⅛	1⅝	2⅛	2⅝	2⅝	3⅛	3⅛	3⅝	4⅛
N	mm	25	25	28	33	28	33	38	38	43	43	48	55
(ODS)	inch	1.0	1.0	1.1	1.3	1.1	1.3	1.5	1.5	1.7	1.7	1.9	2.2
			1-1/4		1-1/2	1-1/2		2					
P	mm	13	15		15	15		15		25		29	32
(SW)	inch	0.5	0.6		0.6	0.6		0.6		1.0		1.1	1.3

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Broadview, IL 60155 USA

How to Order

Type S4 solenoid valves can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Variation	Inlet Flange	Outlet Flange	Coil Voltage, Style	Pilot Light	Lens Color	Strainer	Check Valve
020	S4	X	F08	F08	15	0	0	S	0

Port Size

020	20mm (¾")
025	25mm (1")
032	32mm (1¼")
040	40mm (1⅝")
050	50mm (2")
065	65mm (2½")
075	75mm (3")
100	100mm (4")

Variation

Blank	Standard
E	External Actuating Pressure Supply
SC	Slow Closing

Not all flange types and sizes are available for each port size. See Flange Availability table for allowable combinations.

Flange Type	Connection
X Less Flanges	00 None
F FPT (IPS) S SW (IPS) W Weld Neck (IPS)	06 ¾" 08 1" 10 1¼" 12 1½" 16 2" 20 2½" 24 3" 32 4"
K ODS (US)	07 ⅞" 09 1⅛" 11 1⅜" 13 1⅝" 17 2⅛" 21 2⅝" 25 3⅛" 29 3⅝" 33 4⅛"
D DIN Weld Neck M Insert Metric C EC-Br Copper	Enter size from table below.

⚠ WARNING!
ODS flanges not suitable for use with ammonia.

Volts/Frequency★

0	No Coil
Standard	
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
Non-Standard	
A	24/60
C	480/60
D	24/50
F	48/50
H	24V DC
K	48V DC
W	120V DC

★ See page 48 for coil availability.

Coil Style

0	No Coil
1	Encapsulated w/36" Leads
L	Encapsulated w/36" Leads & Pilot Light*
2	Encapsulated w/DIN Connector
D	Encapsulated w/DIN Connector & Pilot Light*
5	Explosion Proof

* Integral pilot light. Lens color designated separately

Remote Pilot Light▲

0	None
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

▲ With coil style 1 only. See page 48 for voltages.

Lens Color

0	No Pilot Light
G	Green (std)
R	Red
A	Amber
W	White

Strainer

N	No Strainer
S	w/Strainer

Check Valve

0	None
1	w/CK1
4	w/CK4

Flange Availability & Weights

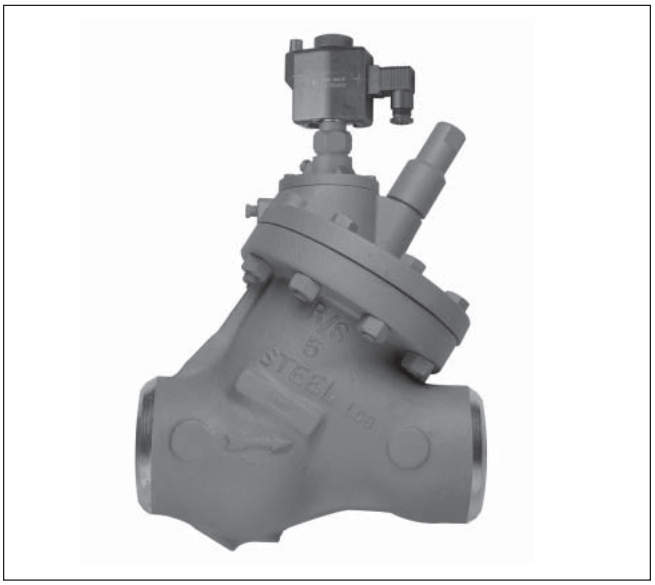
Table shows flange size codes available by flange type for each port size code

Port Code	Flange Connections Available						Weight			
	FPT (IPS)	Socket Weld (IPS) Weld Neck (IPS)	ODS (US)	DIN Weld Neck	Insert Metric	EC-Br Copper	Less Strainer		With Strainer	
							kg	lb	kg	lb
020	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	10	21	13	28
025	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	10	21	13	28
032	10 12	10 12	11 13 17	32 40 50		30 36 42	15	33	22	48
040	12 16	12 16	13 17 21	40 50			31	67	45	99
050	12 16	12 16	13 17 21	40 50			31	67	45	99
065		20	21 25	65 75			38	75	66	144
075		24	25 29	75			55	121	82	180
100		32	33	A0			75	164	127	278

Parker Climate & Industrial Controls

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

- Pilot Operated
- Welds directly in the Line – No Flanges
- Removable Seat is Serviceable from Top Side
- Streamlined Fluid Flow Pattern
- Cast Steel Body, ASTM No. A352 Grade LCB
- PTFE Pilot Seat
- Molded Class “B” Coil Construction
- Manual Opening Stem
- MOPD 20.7 bar (300 PSIG); MRP 27.6 bar (400 PSIG)



Description

These heavy duty, spring closing solenoid valves are suitable for control of ammonia and other common refrigerants, certain oils and other fluids approved for use in refrigeration valves. They weld directly in the line and do not require flanges. The Type S4W are pilot operated valves using upstream pressure for the moving force, and require a minimum of 0.21 bar (3 psi) pressure drop to fully open. The valves are normally closed.

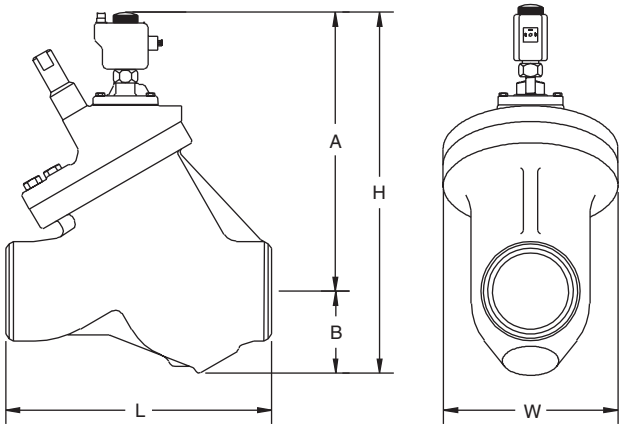
Materials

Body ..... Cast Steel (ASTM A352 Grade LCB)
Seat ..... Metal
Needle ..... Stainless Steel

Specifications

Minimum Pressure Drop
to Open Wide ..... 0.21 bar (3 PSI)
Temperature Range ..... -45° to 105°C (-50° to 220°F)
Coil (see page 48) ..... Class “B” Housing
Flow Coefficients:
125 mm (5”) ..... 171 Kv (200 Cv)
150 mm (6”) ..... 308 Kv (360 Cv)
200 mm (8”) ..... 471 Kv (550 Cv)

Dimensions



Dimension		125mm (5’)	150mm (6’)	200mm (8’)
A	mm	451	527	584
	inch	17.75	20.75	23.00
B	mm	114	152	197
	inch	4.50	6.00	7.75
H	mm	565	679	781
	inch	22.25	26.75	30.75
L	mm	381	483	622
	inch	15.00	19.00	24.50
W	mm	267	318	381
	inch	10.50	12.50	15.00

How to Order

Type S4 solenoid valves can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Variation	Coil Voltage, Style	Pilot Light	Lens Color	Strainer
150	S4		1R	2	G	S

Port Size

125	125mm (5")
150	150mm (6")
200	200mm (8")

Variation

Blank	Standard
E	External Actuating Pressure Supply

Coil Voltage★

0	No Coil
Standard	
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
Non-Standard	
A	24/60
C	480/60
D	24/50
F	48/50
H	24V DC
K	48V DC
W	120V DC

★ See page 48 for available voltage/coil combinations.

Coil Style

0	No Coil or Housing
1	Encapsulated w/36" Leads
L	Encapsulated w/36" Leads & Pilot Light*
2	Encapsulated w/DIN Connector
D	Encapsulated w/DIN Connector & Pilot Light*
5	Explosion Proof

* Integral pilot light. Lens color designated separately.

Remote Pilot Light▲

0	None
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

▲ With coil style 1 only. See page 48 for voltages.

Lens Color

0	No Pilot Light
G	Green (std)
R	Red
A	Amber
W	White

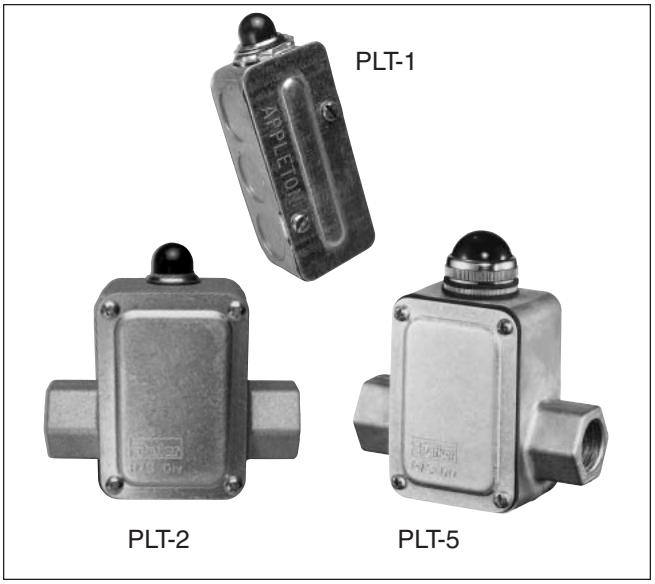
Strainer

N	No Strainer
S	w/Strainer

Connections & Weights

Port Code	Connections Available	Weight			
	Weld End	Less Strainer		With Strainer	
		kg	lb	kg	lb
125	5”	54	120	99	218
150	6”	98	215	177	380
200	8”	159	350	295	650

- Pilot Light Assembly is Completely Self-Contained
- Gives Visual Observation of Solenoid Valve Operation
- Standard Conduit Box or Weatherproof Design



Description

The **PLT-1** assembly is completely self-contained, consisting of a standard conduit box with multiple knockouts for connecting to the R/S coil housing cover. The pilot light is a standard 6-volt bulb.

The **PLT-2** pilot light assembly is completely self-contained, consisting of a cast aluminum conduit box with 1/2" FPT connections, a gasket sealed cover and a moisture sealed pilot light. The light is a standard 6-volt bulb.

Transformer coils can be furnished for 120, 208, 240 volts 60 Hertz and 115 and 230 volts 50 Hertz – all with a 6-volt secondary winding.

The **PLT-5** pilot lights wire directly to line voltage. The bulb is 6 Watts for 120V applications and 10 Watts for 208/240V applications. The large base uses an S6 double contact bayonet bulb. No special transformer coil is required. The PLT-5 weatherproof unit has a cast aluminum box with stamped aluminum cover and rubber gasket. The assembly uses rubber washers to maintain weatherproof condition and is designed for outdoor use.

Ordering Information

Type	Voltage	Lens Color
PLT-2	1	G

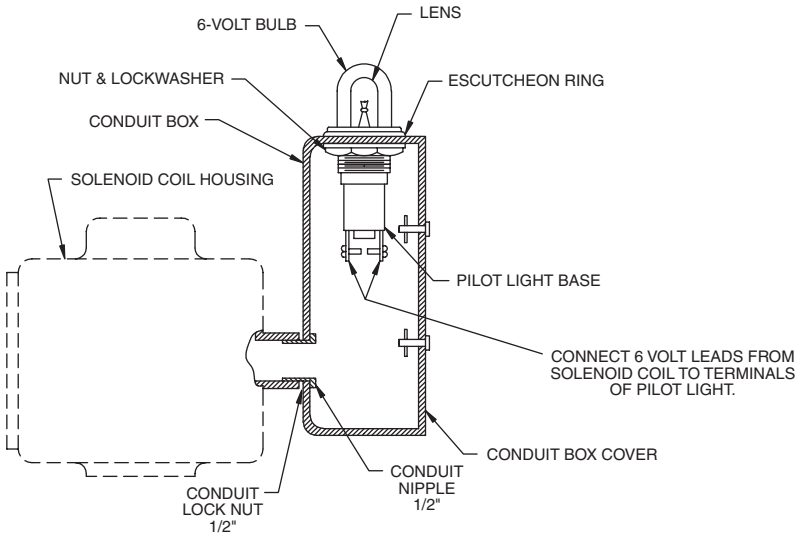
Type	
PLT-1	Transformer Style, NEMA1
PLT-2	Transformer Style, NEMA 4
PLT-5	Direct Wired, Weatherproof

Voltage	
1★	6V Secondary
2◆	120/60
3◆	208/60 or 240/60

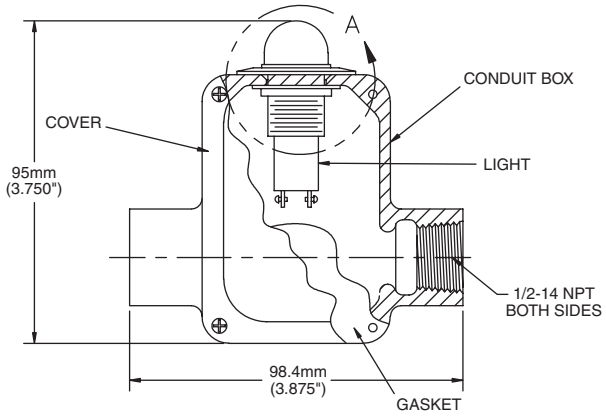
★ PLT-1 & PLT-2 only
◆ PLT-5 only

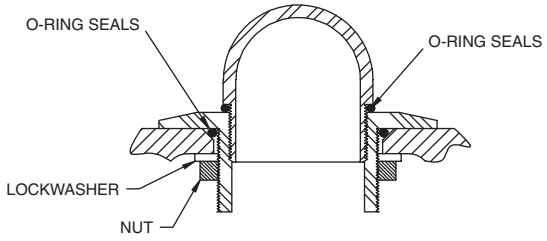
Lens Color	
G	Green (std)
R	Red
A	Amber
W	White

PLT-1



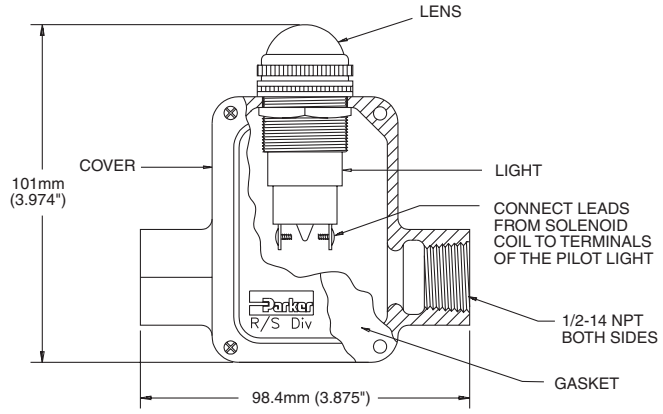
PLT-2

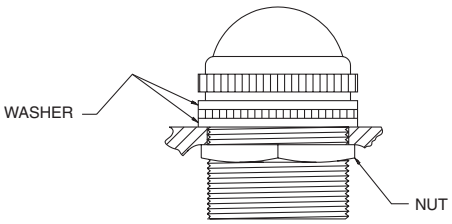




VIEW A ENLARGED

PLT-5





ENLARGED VIEW

Class 'B" Coil

The molded water resistant Class "B" solenoid coil, available on most Refrigerating Specialties solenoid valves, is designed for long life and powerful opening force. The standard coil housing meets NEMA 3R and 4 requirements. This sealed construction can withstand direct contact with moisture and ice. The coil housing far exceeds the requirements of NEMA Standard ICS.1-110.57 salt spray test for rust resistance.

By definition, Class "B" coil construction will permit coil temperatures, as measured by resistance method, as high as 130°C (266°F). Final coil temperatures are a function of both fluid and ambient temperatures. The higher fluid temperatures require lower ambient temperatures so the maximum coil temperature is not exceeded. Conversely, low fluid temperatures permit higher ambient temperatures.

The supply circuits must be properly sized to give adequate voltage at the coil even when other electrical equipment is operating. The coil is designed to operate with line voltage from 85% to 110% of rated coil voltage. Power consumption during normal operation will be 33 watts or less.

Standard Encapsulated Coils

Volts/Hertz	Leads	Inrush Current (Amps)	Holding Current (Amps)	Fuse Size (Amps)
120/60	Blue	1.18	0.46	1
208/60	Blue and Red	0.63	0.26	1
240/60	Red	0.60	0.23	1
115/50	Yellow and Blue	1.22	0.21	1
230/50	Yellow	0.65	0.26	1

For other voltages, contact factory. On transformer coil, the 6 volt leads are always black.

Class 'H" Coil (SV2 only)

The Refrigerating Specialties Division molded water resistant Class "H" coil is designed for long life and powerful opening force. The Class "H" coil construction will permit coil temperatures, as measured by resistance method, as high as 180°C (365°F).

The supply circuits must be properly sized to give adequate voltage at the coil leads even when other electrical equipment is operating. The coil is designed to operate at 15% under voltage. Operating with line voltage below the limit will result in lowering the valve opening pressure differential.

Currents

Coil Type	Watt Rating	Volt Amperage	
		Holding	Inrush
Standard AC Class 'H"	10.5	23	37
Standard AC Coil with 6v Secondary Pilot Light	11.0	26	38

Voltages

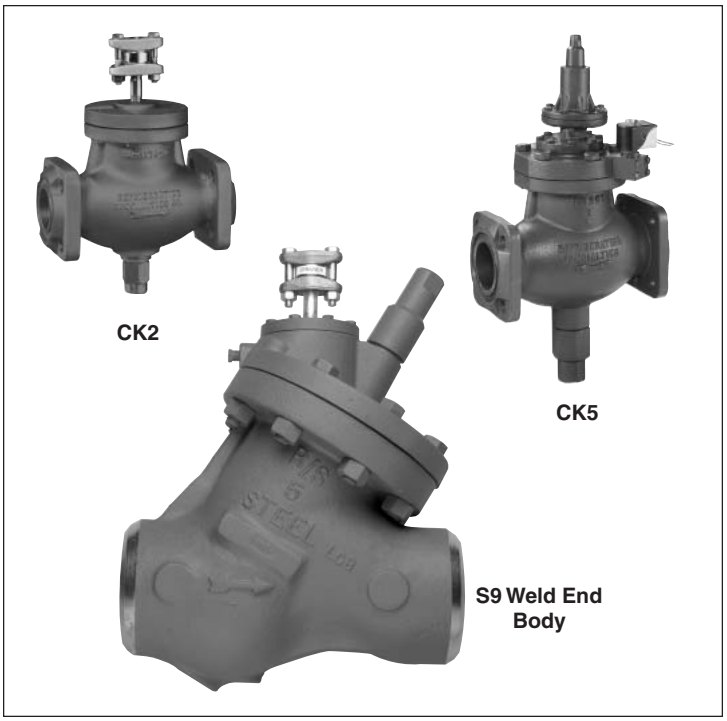
Coils are available from stock with most standard voltages (see table below). Non-standard voltages (shown in shaded area of table) can be special ordered. Coils are also available with 6V secondary voltage for use with remote pilot lights PLT-1 and PLT-2.

NOTE: Pilot lights cannot be used with explosion proof or unleaded (DIN connector) coils.

■ These voltages for the Class "H" coils are 120/60-110/50, 240/60-220/50, 480/60-440/50.

Available Voltages for Coils and Pilot Lights	Code	Class	120/60	120/6/60	208/60	208/6/60	240/60	240/6/60	115/50	230/50	230/6/50	240/50	24/60	480/60	24/50	48/50	24VDC	120VDC	48VDC
Encapsulated w/Leads	1	B	●	●	●	●	●	●	●	●		●	●		●	●			
Encapsulated w/Leads & Integral Pilot Light	L	B	●		●		●			●									
Encapsulated w/DIN Connector	2	B	●				●		●	●		●							●
Encapsulated w/DIN & Integral Pilot Light	D	B	●						●	●									
Explosion Proof	5	–	●		●		●		●	●			●	●			●	●	
Compact A,B Operator w/Leads	6	H	■	■	●	●	■	■	●	●		●	●	■	●		●		
Compact A,B Operator w/DIN	7	H	■		●		■		●	●		●	●	■	●				
PLT-1 (NEMA 1)				●		●		●			●								
PLT-2 (NEMA 4)				●		●		●			●								
PLT-5 (NEMA 4)			●		●		●												

- Very low pressure drop for low temperatures
- Ideal for overfeed or flooded systems
- Use in Vertical or Horizontal Line
- Pilot Connection Contains Disc Strainer between a Pair of Flanges
- Suitable to -50°C (-60°F)
- Main valve can lie on its side for minimum pressure drop with two-phase flow
- Manual opening stem
- Condenser gas powered piston and heavy return spring on Type S9 overcome viscous oil conditions



Common Specifications

Max. Opening Pressure Difference ..... 20.7 bar (300 psig)
Design Pressure (MRP) ..... 27.6 Bar (400 psig)
Maximum Fluid Temperature ..... 105°C (220°F)
Coil Insulation ..... Molded Waterproof Class B
Standard Coil Housing ..... NEMA 3R and 4

Specifications

Type		CK2	CK2	CK5	CK5	S9	S9
Port Size	mm	32	40-150	32	40-150	50-100	125-200
	inch	1¼"	1⅝" - 6"	1¼"	1⅝" - 6"	2" - 4"	5" - 8"
Seat Material		PTFE	Metal	PTFE	Metal	Metal	Metal
Body Material		Gray Iron	Gray Iron	Gray Iron	Gray Iron	Gray Iron	Cast Steel
Minimum Pressure Drop to Open Wide	bar	0	0	0	0	0	0
	psi	0	0	0	0	0	0
Minimum Fluid Temperature	°C	-50°	-50°	-50°	-50°	-50°	-50°
	°F	-60°	-60°	-60°	-60°	-60°	-60°
Operation		Normally Open	Normally Open	Normally Open	Normally Open	Normally Closed	Normally Closed
Bulletin for Reference		50-12	50-12	50-23	50-23	31-90	30-05

Selection Guide

Refrigerant Application	Refrigerant Temperature Range	VALVE MOST RECOMMENDED –Listed by Port Size											
		15mm	20mm	25mm	32mm	40mm	50mm	65mm	75mm	100mm	125mm	150mm	200mm
		½	¾	1"	1¼	1	⅝"	2"	2½	3"	4"	5"	6"	8"
Suction	Above -50°C (-60°F) Normally Open*	Use larger size →			CK2 CK5	CK2A CK5	CK2 CK5	CK2 CK5	CK2 CK5	CK2 CK5	CK2 CK5	CK2 CK5	— —
	Above -50°C (-60°F) Normally Closed*	Use larger size → → → → →					S9	S9	S9	S9	S9	S9	S9

Recommendations assume no highly viscous oil, dirt, moisture or foreign substance in refrigerant; also no abnormal shock impact below -30°C (-25°F).

* Use CK2 only above -30°C (-25°F) if not powered by near oil free hot gas, such as in rotary screw compressor systems.

- Normally Open
- Low Pressure Drop
- Heavy Return Spring
- Manual Opening Stem
- Use in Vertical or Horizontal Line
- Main Valve Can be Installed on Side
- Maximum Rated Pressure (MRP): 27.6 bar (400 psig)

Description

These piston type, pressure powered, normally open, heavy duty valves are built with control valve precision. All are equipped with flanges and manual lift stem. The 32mm (1¼") port size has a PTFE main seat; 40 mm (1⅝") port and larger have a metal to metal seat.

Specifications

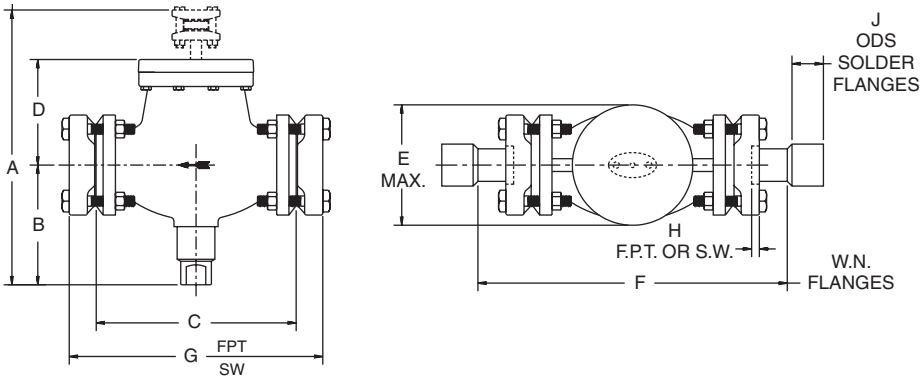
Minimum Pressure Drop
to Open Wide ..... 0 bar (0 PSI)
Minimum Fluid Temperature ..... -50°C (-60°F)
Coil (See page 30) ..... Class "B" Housing
Flow Coefficient:
- 32mm (1¼") ..... 16.3 Kv (19.0 Cv)
- 40mm (1⅝") ..... 31.7 Kv (37.0 Cv)
- 50mm (2") ..... 43.7 Kv (51.0 Cv)
- 65mm (2½") ..... 70.2 Kv (82.0 Cv)
- 75mm (3") ..... 103 Kv (120 Cv)
- 100mm (4") ..... 171 Kv (200 Cv)
- 125mm (5") ..... 244 Kv (285 Cv)
- 150mm (6") ..... 342 Kv (400 Cv)

Materials

Body ..... Gray Iron
Seat:
- 32mm (1¼") ..... PTFE
- 40-150mm (1⅝"-6") ..... Metal

Needle ..... Stainless Steel

Dimensions



DIMENSIONAL DATA																			
PORT SIZE		A		B		C		D		E		F		G		H		J	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
32	1¼	312.7	12.31	122	4.8	203	8.0	96.5	3.8	86.4	3.4	304	12.0	256	10.1	15	0.6	33	1.3
40	1⅝	359.9	14.17	139.7	5.5	251	9.9	129.5	5.1	129.5	5.1	371	14.6	307	12.1	15	0.6	38	1.5
50	2	359.9	14.17	139.7	5.5	251	9.9	129.5	5.1	129.5	5.1	371	14.6	307	12.1	15	0.6	38	1.5
65	2½	396.5	15.6	142.2	5.6	251	9.9	160	6.3	147.3	5.8	401	15.8	331	13.0	25	1.0	43	1.7
75	3	475.0	18.7	216	8.5	311	12.2	167.6	6.6	167.6	6.6	478	18.8	389	15.3	29	1.1	48	1.9
100	4	518.2	20.4	217	8.6	359	14.1	208.3	8.2	190.5	7.5	571	22.5	450	17.7	32	1.3	55	2.2
125	5	586.7	23.15	298.4	11.7	381	15.0	198.1	7.8	228.6	9.0	576.6	22.7	485	19.1	30.5	1.2	—	—
150	6	628.6	24.7	355.6	14.0	514.3	20.2	180.3	7.1	294.6	11.6	706.1	27.8	617	24.3	35.6	1.4	—	—

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

How to Order

Type CK2 solenoid valves can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Inlet Flange	Outlet Flange	Pilot Connection	Pilot Option	Coil Voltage Coil Style	Pilot Light	Lens Color	Strainer
050	CK2	F12	F12	F03	1	12	0	0	S

Not all flange types and sizes are available for each port size. See Flange Availability table for allowable combinations.

Port Size

032	32mm (1¼")
040	40mm (1⅝")
050	50mm (2")
065	65mm (2½")
075	75mm (3")
100	100mm (4")
125	125mm (5")
150	150mm (6")

Flange Type	Connection
X Less Flanges	**00** None
F FPT (IPS) **S** SW (IPS) **W** Weld Neck (IPS)	**10** 1¼" **12** 1½" **16** 2" **20** 2½" **24** 3" **32** 4" **40** 5" **48** 6"
K ODS (US)	**11** 13/8" **13** 15/8" **17** 21/8" **21** 25/8" **25** 31/8" **29** 35/8" **33** 41/8"
D DIN Weld Neck **C** EC-Br Copper	Enter size from table below.

Pilot Option

0	No Pilot Solenoid
1	Pilot Solenoid only
2	Pilot Solenoid w/Strainer

Pilot Strainer Connection*

Flange Type	Connection
F FPT (IPS) **S** SW (IPS) **W** Weld Neck (IPS)	**02**★ ¼" **03** 3/8" **04** ½" **06** ¾"
K ODS (US)	**04** ½" **05** 5/8" **07** 7/8"

Must be specified even if pilot solenoid is not ordered. See note below.
★FPT only.

Coil Voltage

0	No Coil
Standard	
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
Non-Standard	
A	24/60
D	24/50
F	48/50
K	48V DC

Coil Style★

0	No Coil or Housing
1	Encapsulated w/36" Leads
L	Encapsulated w/36" Leads & Pilot Light*
2	Encapsulated w/DIN Connector
D	Encapsulated w/DIN Connector & Pilot Light*

★ See table on page 30 for coil style/voltage combinations.
* Integral pilot light. Lens color designated separately

Pilot Light

Remote Pilot Light ▲

0	None
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

▲ Available with coil style 1 only. See table on page 30 for voltages.

Lens Color

0	No Pilot Light
G	Green (std)
R	Red
A	Amber
W	White

Strainer

N	No Strainer
S	w/Strainer

⚠ WARNING!
ODS flanges not suitable for use with ammonia.

NOTE: Where pilot solenoid valve is designated in this model code, its companion flanges will be supplied to correspond to pilot connection as selected within this model number. Customer may designate pilot style "0" and order pilot solenoid valve separately.

Flange Availability & Weights

Table shows flange size codes available by flange type for each port size code

Port Code	Flange Connections Available					Weight			
	FPT (IPS)	Socket Weld (IPS) Weld Neck (IPS)	ODS (US)	DIN Weld Neck	EC-Br Copper	Less Flanges		With Flanges	
						kg	lb	kg	lb
032	10 12	10 12	11 13 17	32 40 50	30 36 42	13	28	15	33
040	12 16	12 16	13 17 21	40 50		25	55	28	60
050	12 16	12 16	13 17 21	40 50		25	55	28	60
065		20	21 25	65 75		34	74	36	79
075		24	25 29	75		47	104	50	109
100		32	33	A0		71	157	74	162
125		40				128	282	131	287
150		48				204	450	207	455

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- Normally Open
- Low Pressure Drop
- Manual Opening Stem
- Integrated Pilot Solenoid on 32mm to 100mm (1 -1/4" to 4") Sizes
- Use in Vertical or Horizontal Line
- Can be Installed on Side
- Maximum Rated Pressure (MRP): 27.6 bar (400 psig)

Description

These piston-type, discharge gas powered, normally open, heavy duty valves are built with control precision. The 32mm through 100mm (1¼" through 4") port size valves are equipped with an attached modular pilot solenoid, A2D pilot regulator, and manual lift stem. The 125mm and 150mm (5" and 6") port size versions of this unique suction stop valve utilize a larger capacity, remotely piped pilot operated solenoid, the R/S type S8F. In addition, the pilot regulator for these two larger sized valves is mounted on top of valve with the strainer disc assembly piped into the side of the adapter.

Materials

Body ..... Gray Iron

Seat:

32mm (1¼") ..... PTFE

40-150mm (1⅝"-6") ..... Metal

Needle ..... Stainless Steel

Specifications

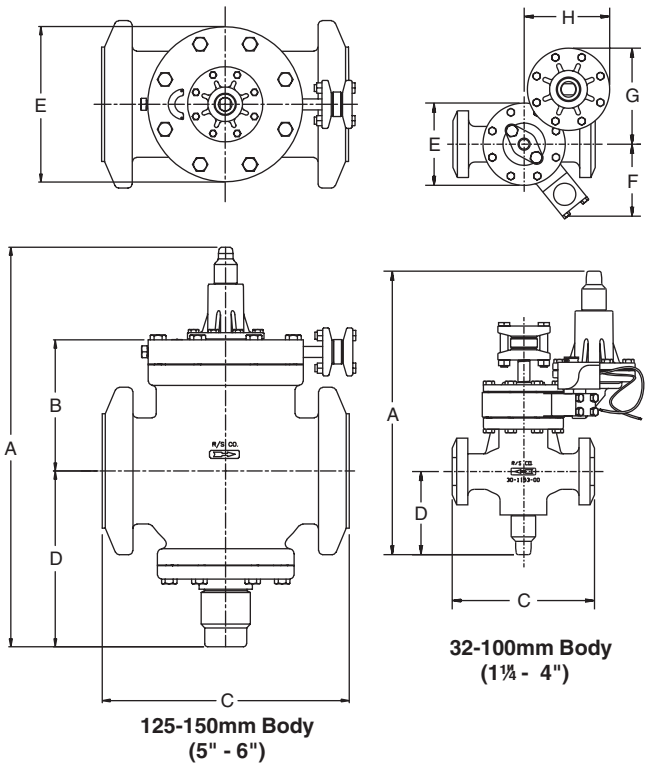
Minimum Pressure Drop to Open Wide ..... 0 bar (0 PSI)

Minimum Fluid Temperature ..... -50°C (-60°F)

Coil (See page 30) ..... Class “H” Housing

Flow Coefficient:

32mm (1¼") ..... 16.3 Kv (19.0 Cv)
40mm (1⅝") ..... 31.7 Kv (37.0 Cv)
50mm (2") ..... 43.7 Kv (51.0 Cv)
65mm (2½") ..... 70.2 Kv (82.0 Cv)
75mm (3") ..... 103 Kv (120 Cv)
100mm (4") ..... 171 Kv (200 Cv)
125mm (5") ..... 244 Kv (285 Cv)
150mm (6") ..... 342 Kv (400 Cv)



125-150mm Body (5" - 6")

32-100mm Body (1¼ - 4")

Dimensions

Dimension	1-1/4"	1-5/8"	2"	2-1/2"	3"	4"	5"	6"
A	17.6	19.7	19.7	20.2	24.9	27	23.2	26.8
B							8.4	7.7
C	8	9.9	9.9	9.9	12.1	14.1	15	20.2
D	6.3	6.9	6.9	7.1	10.7	11.5	11.7	14
E	4.6	5.5	5.5	6.2	7	8.8	9	11.6
F	4.4	4.6	4.6	4.9	5.6	6.2		
G	5.4	5.5	5.5	5.9	6.6	7.7		
H	4.8	5.3	5.3	5.2	4.8	5.5		

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How to Order

Type CK5 valves can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Inlet Flange	Outlet Flange	Pilot Connection	Pilot Option	Coil Voltage, Coil Style	Pilot Light	Lens Color	Strainer
050	CK5	F16	F16	F03	1	12	0	0	S

Port Size

032	32mm (1¼")
040	40mm (15/8")
050	50mm (2")
065	65mm (2½")
075	75mm (3")
100	100mm (4")
125	125mm (5")
150	150mm (6")

Not all flange types and sizes are available for each port size. See Flange Availability table for allowable combinations.

Flange Type	Connection
X Less Flanges	00 None
F FPT (IPS) S SW (IPS) W Weld Neck (IPS)	10 1¼" 12 1½" 16 2" 20 2½" 24 3" 32 4" 40 5" 48 6"
K ODS (US)	11 1 3/8" 13 1 5/8" 17 2 1/8" 21 2 5/8" 25 3 1/8" 29 3 5/8" 33 4 1/8"
D DIN Weld Neck C EC-Br Copper	Enter size from table below.

WARNING!
ODS flanges not suitable for use with ammonia.

Pilot Option

0*	No Pilot Solenoid
1	With Pilot Solenoid
2*	With Pilot Solenoid and Strainer

* Available with 5" and 6" valves only. See note below.

Pilot Strainer Connection*

Flange Type	Connection
F FPT (IPS) S SW (IPS) W Weld Neck (IPS)	02★ ¼" 03 3/8" 04 ½" 06 ¾"
K ODS (US)	04 ½" 05 5/8" 07 7/8"

Must be specified even if pilot solenoid is not ordered.
★FPT only.

Strainer

N	No Strainer
S	w/Strainer

Lens Color

0	No Pilot Light
G	Green (std)
R	Red
A	Amber
W	White

Remote Pilot Light▲

0	None
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

▲ With coil styles 1 & 8 only. See page 30 for voltages.

Coil Voltage★

	Standard		Non-Standard
0	No Coil		
1	120/60	A	24/60
R	120/6/60	D	24/50
2	208/60	F	48/50
S	208/6/60	K	48V DC
3	240/60		
T	240/6/60		
6	115/50		
7	230/50		
8	240/50		

★ See table on page 30 for coil style/voltage combinations.

Coil Style (32-100mm)

0	No Coil or Housing
8	Compact C, D Operator w/18" Leads
9	Compact C, D Operator w/DIN Connector

Coil Style (125-150mm)

0	No Coil or Housing
1	Encapsulated w/36" Leads
L	Encapsulated w/36" Leads & Pilot Light*
2	Encapsulated w/DIN Connector
D	Encapsulated w/DIN Connector & Pilot Light*

* Integral pilot light. Lens color designated separately

NOTE: For sizes 125 and 150 only: Where pilot solenoid valve is designated by this model code, its companion flanges will be supplied to correspond to pilot connection as selected within this model number. Customer may designate pilot style "0" and order S8F pilot solenoid valve separately.

Flange Availability & Weights

Table shows flange size codes available by flange type for each port size code

Port Code	Flange Connections Available					Weight			
	FPT (IPS)	Socket Weld (IPS) Weld Neck (IPS)	ODS (US)	DIN Weld Neck	EC-Br Copper	Less Flanges		With Flanges	
						kg	lb	kg	lb
032	10 12	10 12	11 13 17	32 40 50	30 36 42	13	28	15	33
040	12 16	12 16	13 17 21	40 50		25	55	28	60
050	12 16	12 16	13 17 21	40 50		25	55	28	60
065		20	21 25	65 75		34	74	36	79
075		24	25 29	75		47	104	50	109
100		32	33	A0		71	157	74	162
125		40				128	282	131	287
150		48				204	450	207	455

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- Port Sizes 50-100mm (2" - 4")
- Low Pressure Drop for Low Temperature Operation
- Suitable to -50°C (-60°F)
- Can Be Installed in Vertical or Horizontal Position
- Manual Opening Feature
- Maximum Rated Pressure (MRP): 27.6 bar (400 PSIG)

Description

This heavy duty gas powered valve is suitable for Ammonia, R-22, R404a, and R507, other refrigerants, certain oils and other fluids approved for use in refrigeration. They are pilot operated semi-steel bodied valves. The valves may be opened by means of the manual opening stem for servicing or in case of electrical power failure.

The Type S9 is a pilot operated valve but uses an external source of higher pressure gas to operate the valve, and, therefore requires no minimum pressure drop to open. The external gas pressure must be at least 0.69 bar (10 psi) above valve internal upstream pressure for positive opening. This valve is normally closed.

Specifications

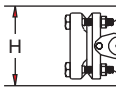
Minimum Pressure Drop
to Open Wide ..... 0 bar (0 PSI)
Minimum Fluid Temperature ..... -50°C (-60°F)
Coil (See page 30) ..... Class "B" Housing
Flow Coefficient:
50mm (2") ..... 38.5 Kv (45.0 Cv)
65mm (2½") ..... 55.6 Kv (65.0 Cv)
75mm (3") ..... 85.6 Kv (100 Cv)
100mm (4") ..... 154 Kv (180 Cv)

Materials

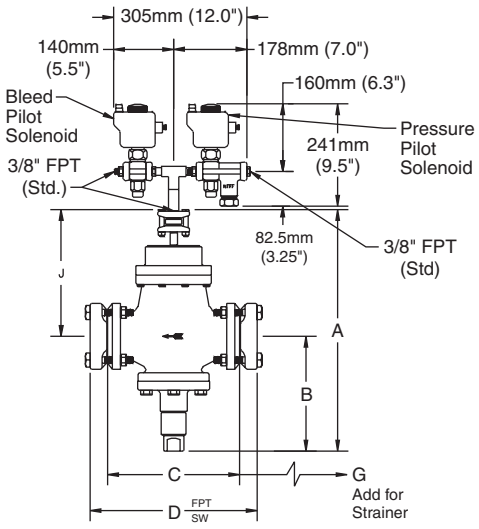
Body ..... Gray Iron
Seat ..... Metal

Dimensions

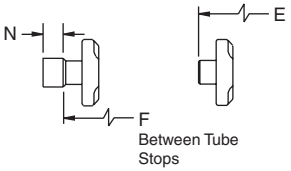
Dimension		50mm (2")			65mm (2-1/2")		75mm (3")		100mm (4")
A	MM	429			455		570		615
	INCH	16.9			17.9		22.4		24.2
B	MM	175			180		269		292
	INCH	6.9			7.1		10.6		11.5
C	MM	251			251		311		366
	INCH	9.9			9.9		12.2		14.4
D (FPT,SW)	MM	307			331		389		450
	INCH	12.1			13.0		15.3		17.7
E (WN)	CONN.	1-1/2		2	2-1/2		3		4
	MM	364		371	401		478		571
	INCH	14.3		14.6	15.8		18.8		22.5
F (ODS)	CONN.	1-5/8	2-1/8	2-5/8	2-5/8	3-1/8	3-1/8	3-5/8	4-1/8
	MM	358	338	358	348	389	414	432	503
	INCH	14.1	13.3	14.1	13.7	15.3	16.3	17	19.8
G	MM	251			314		314		363
	INCH	9.9			12.4		12.4		14.3
H	MM	140			159		176		222
	INCH	5.5			6.2		7.0		8.8
J	MM	254			274		300		323
	INCH	10.0			10.8		11.8		12.7
N (ODS)	CONN.	1-5/8	2-1/8	2-5/8	2-5/8	3-1/8	3-1/8	3-5/8	4-1/8
	MM	28	33	38	38	43	43	48	55
	INCH	1.1	1.3	1.5	1.5	1.7	1.7	1.9	2.2



Allow 100mm (4.0") above valve
for removal of coil knob & coil.



Allow 25mm (1.0") below valve
to operate manual opening stem



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How to Order

Type S9 flanged body valves can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Inlet Flange	Outlet Flange	Pilot Connection	Pilot Option	Volts/Frequency, Coil Style	Pilot Light	Lens Color	Strainer
050	S9	F12	F12	F03	1	21	0	0	S

Port Size

050	50mm (2")
065	65mm (2½")
075	75mm (3")
100	100mm (4")

Not all flange types and sizes are available for each port size. See Flange Availability table for allowable combinations.

Flange Type	Connection
X Less Flanges	**00** None
F FPT (IPS) **S** SW (IPS) **W** Weld Neck (IPS)	**12** 1½" **16** 2" **20** 2½" **24** 3" **32** 4"
K ODS (US)	**13** 1 5/8" **17** 2 1/8" **21** 2 5/8" **25** 3 1/8" **29** 3 5/8" **33** 4 1/8"
D DIN Weld Neck	Enter size from table below.

⚠ WARNING!
ODS flanges not suitable for use with ammonia.

Pilot Option

0	No Pilot Assembly
1	With Pilot Assembly

Pilot Strainer Connection*

Flange Type	Connection
F FPT (IPS) **S** SW (IPS) **W** Weld Neck (IPS)	**02**★ ¼" **03** 3/8" **04** ½" **06** ¾"
K ODS (US)	**04** ½" **05** 5/8" **07** 7/8"

Must be specified even if pilot solenoid is not ordered. See note below.
★FPT only.

Volts/Frequency

0	No Coil
Standard	
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
Non-Standard	
A	24/60
D	24/50
F	48/50
K	48V DC

★ See page 30 for coil style/voltage combinations.

Coil Style

0	No Coil or Housing
1	Encapsulated w/36" Leads
L*	Encapsulated w/36" Leads & Pilot Light
2	Encapsulated w/DIN Connector
D*	Encapsulated w/DIN Connector & Pilot Light

* Integral pilot light. Lens color designated separately

Remote Pilot Light▲

0	None
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

▲ With coil style 1 only. See page 30 for voltages.

Lens Color

0	No Pilot Light
G	Green (std)
R	Red
A	Amber
W	White

Strainer

N	No Strainer
S	w/Strainer

NOTE:

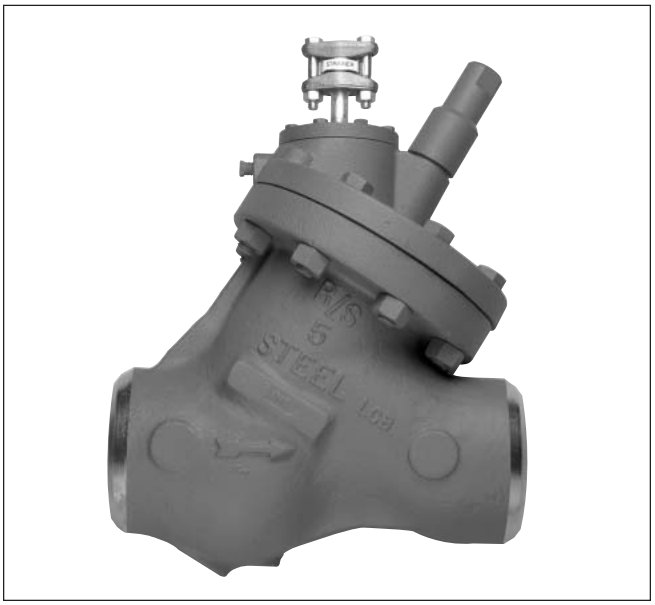
Where pilot solenoid assembly is designated by this model code, its companion flanges will be supplied to correspond to pilot connection as selected within this designation. Coil and remote pilot light selections will apply to both solenoids. Customer may designate pilot style "0" and order pilot assembly separately (see page 58).

Flange Availability & Weights

Table shows flange size codes available by flange type for each port size code

Port Code	Flange Connections Available				Weight			
	FPT (IPS)	Socket Weld (IPS) Weld Neck (IPS)	ODS (US)	DIN Weld Neck	With Flanges		With Pilots & Flanges	
					kg	lb	kg	lb
050	12 16	12 16	13 17 21	40 50	30	66	37	80
065		20	21 25	65 75	39	94	45	102
075		24	25 29	75	54	10	61	133
100		32	33	A0	74	173	81	177

- Port Sizes 125-200mm (5" - 8")
- Pilot Operated
- Welds directly in the Line – No Flanges
- Removable Seat is Serviceable from Top Side
- Coil Size Same as Most Other R/S Valves
- Streamlined Fluid Flow Pattern
- Cast Steel Body, ASTM No. A352 Grade LCB
- PTFE Pilot Seat
- Molded Class “B” Coil Construction
- Manual Opening Stem
- Maximum Rated Pressure (MRP): 27.6 bar (400 PSIG)



Description

These heavy duty, normally closed, gas powered valves are suitable for control of ammonia and other common refrigerants, certain oils and other fluids approved for use in refrigeration.

The Type S9 are pilot operated but use an external source of higher pressure gas to operate the valve and, therefore, require no minimum pressure drop to open. The external gas pressure must be at least 0.71 bar (10 psi) above valve internal upstream pressure for positive opening.

The S9 valve can be ordered without a pilot assembly and the pilot assembly ordered separately (see page 58).

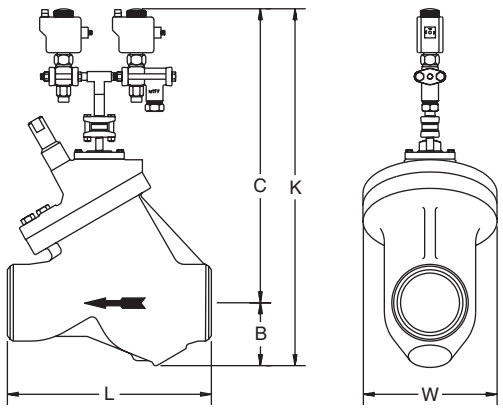
Materials

Body ..... Cast Steel
Seat ..... Metal

Specifications

Minimum Pressure
to Open Wide ..... 0.71 bar (10 PSI)
Fluid Temperature Range ... -45° to 100°C (-50° to 220°F)
Coil (See page 30) ..... Class “B” Housing
Flow Coefficients:
125 mm (5”) ..... 171 Kv (200 Cv)
150 mm (6”) ..... 308 Kv (360 Cv)
200 mm (8”) ..... 471 Kv (550 Cv)

Dimensions



Dimension		125mm (5’)	150mm (6’)	200mm (8’)
B	mm	114	152	197
	inch	4.50	6.00	7.75
C	mm	597	673	730
	inch	23.50	26.50	28.75
K	mm	711	825	927
	inch	28.00	32.50	36.50
L	mm	381	483	622
	inch	15.00	19.00	24.50
W	mm	267	318	381
	inch	10.50	12.50	15.00

How to Order

Type S9 weld end body valves can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Pilot Connection	Pilot Assembly	Coil Voltage, Coil Style	Pilot Light	Lens Color	Strainer
150	S9	F03	1	12	0	0	S

Port Size

125	125mm (5")
150	150mm (6")
200	200mm (8")

Pilot Strainer Connection*

Flange Type		Connection	
F	FPT (IPS)	**02★**	¼"
S	SW (IPS)	**03**	3/8"
W	Weld Neck (IPS)	**04**	½"
		06	¾"
K	ODS (US)	**04**	½"
		05	5/8"
		07	7/8"

Must be specified even if pilot solenoid is not ordered. See note below.

★FPT only.

Pilot Assembly

0	No Pilot Assembly
1	With Pilot Assembly

Coil Voltage

0	No Coil
Standard	
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
Non-Standard	
A	24/60
D	24/50
F	48/50
K	48V DC

★ See page 30 for coil style/voltage combinations.

Coil Style

0	No Coil or Housing
1	Encapsulated w/36" Leads
L	Encapsulated w/36" Leads & Pilot Light*
2	Encapsulated w/DIN Connector
D	Encapsulated w/DIN Connector & Pilot Light*

* Integral pilot light. Lens color selected separately

Pilot Light

Remote Pilot Light▲

0	None
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

▲ With coil style 1 only. See page 30 for voltages.

Lens Color

***Lens Color**

0	No Pilot Light
G	Green (std)
R	Red
A	Amber
W	White

Strainer

N	No Strainer
S	w/Strainer

⚠ WARNING!
ODS flanges not suitable for use with ammonia.

NOTE:

Where pilot solenoid assembly is designated by this model code, its companion flanges will be supplied to correspond to pilot connection as selected within this designation. Coil and remote pilot light selections will apply to both solenoids. Customer may designate pilot style "0" and order pilot assembly separately (see page 58).

Weights

Port Code	Weight			
	Less Pilots		With Pilots	
	kg	lb	kg	lb
125	60	134	150	234
150	103	229	182	404
200	163	372	304	672

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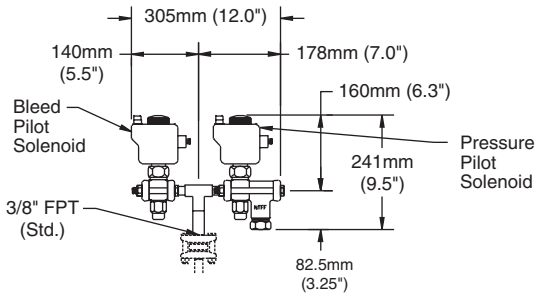
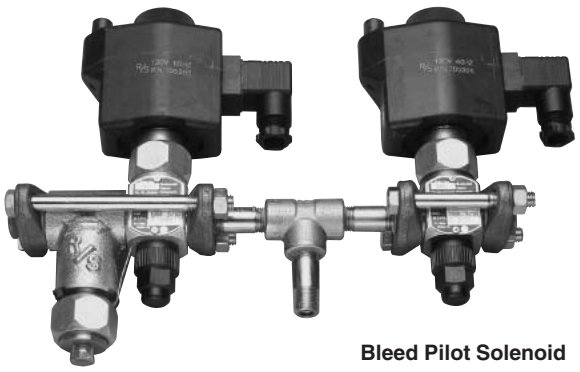
Description

The S9 Pilot Assembly can be ordered separately from the valve for stock or field assembly. Assembly includes a S6N pressure pilot solenoid with close coupled strainer, a S6N bleed pilot solenoid, required piping and flange connections. See Note below.

The 50mm (2") S9 valve uses a 050 size assembly. Valves 65mm (2½") and larger use the 065 size assembly.





Bleed Pilot Solenoid

Pressure Pilot Solenoid with Strainer

How to Order

Type S9 pilot assembly can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Size	Type	Flanges	Coil Voltage, Coil Style	Pilot Light	Lens Color
065	PS9	F03	12	0	0

Size

050	Use with 50mm (2") S9 valve
065	Use with 65 - 200mm (2½"- 8") S9 valves

Flange Type		Connection	
F	FPT (IPS)	**02★**	¼"
S	SW (IPS)	**03**	3/8"
W	Weld Neck (IPS)	**04**	½"
		06	¾"
K	ODS (US)	**04**	½"
		05	5/8"
		07	7/8"

★FPT only.

⚠ WARNING!
ODS flanges not suitable for use with ammonia.

Coil Voltage★

0	No Coil
Standard	
1	120/60
R	120/6/60
2	208/60
S	208/6/60
3	240/60
T	240/6/60
6	115/50
7	230/50
8	240/50
Non-Standard	
A	24/60
D	24/50
F	48/50
K	48V DC

★ See page 30 for coil style/voltage combinations.

Coil Style

0	No Coil or Housing
1	Encapsulated w/36" Leads
L*	Encapsulated w/36" Leads & Pilot Light
2	Encapsulated w/DIN Connector
D*	Encapsulated w/DIN Connector & Pilot Light

* Integral pilot light. Lens color selected separately

Remote Pilot Lights▲

0	None
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)
5	PLT-5

▲ With coil style 1 only. See page 30 for voltages.

Lens Color

0	No Pilot Light
G	Green (std)
R	Red
A	Amber
W	White

NOTES:

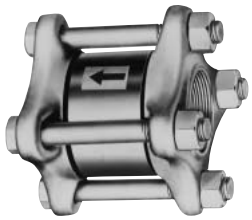
1. Flanges connected to the piping supplied are standard 3/8" FPT. Flanges selected within the model number will be supplied for both inlet and outlet of the assembly.
2. Coil and remote pilot light selections will be provided for both pilot solenoids.

Weights

Size	kg	lb
050	60	134
065	103	229

CK1

CK3



CK4

13-100mm
(½" - 4")

CK4

125-200mm
(5" - 8")

Specifications

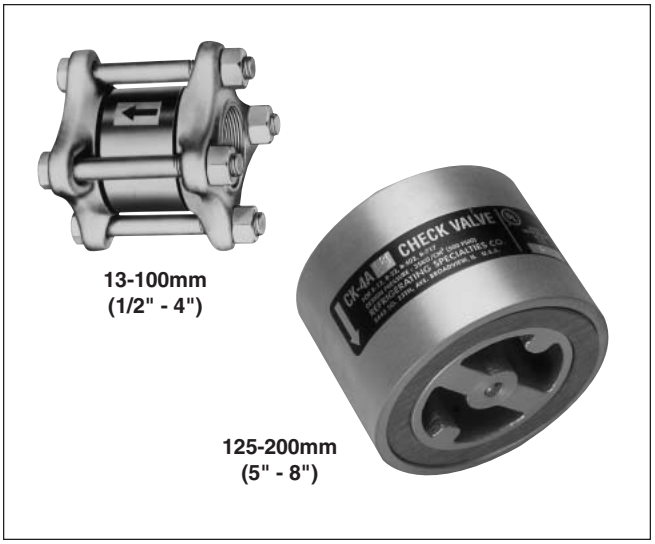
Type		CK4A	CK4A	CK4A	CK1	CK1	CK3
Port Size	mm	13	20-100	125-200	20-32	40-150	—
	inch	½"	¾" - 4"	5" - 8"	¾" - 1¼"	1⅝" - 6"	½ - 1 FPT
Seat Material		Stainless Steel	Stainless Steel	Stainless Steel	PTFE	Metal to Metal	PTFE
Body Material		Steel	Ductile Iron	Ductile Iron	Gray Iron	Gray Iron	Steel
Design Pressure (MRP)	bar	34.5	34.5	34.5	20.7	20.7	20.7
	psi	500	500	500	300	300	300
Fluid Temperature Limits	°C	-55° to 105°	-55° to 105°	-55° to 105°	-30° to 105°	-30° to 105°	-30° to 105°
	°F	-60° to 220°	-60° to 220°	-60° to 220°	-25° to 220°	-25° to 220°	-25° to 220°
Close Coupling to Valve*		Yes	Yes	No	Yes	Up to 100mm	No
Close Coupled Inlet Strainer		Yes	Yes	No	Yes	Up to 100mm	No
Minimum Pressure Drop to Open Wide	bar	0.05	0.05	0.05	0.03	0.03	0.34
	psi	0.75	0.75	0.75	0.5	0.5	5
Bulletin for Reference		50-16	50-16	50-20	50-10	50-10	50-13

*Close coupling using male adapter ring to outlet of R/S control valves.

Selection Guide

Type	Port Sizes	Typical Applications	Mounting
CK4	13-200mm (½" - 8")	1. Liquid lines 2. High speed compressor discharge lines (Not recommended for slow speed compressor discharge lines) 3. Pump discharge lines 4. Suction lines down to -55°C (-60°F) 5. Hot gas lines from pan to evaporator 6. Defrost relief regulator venting to an imtermediate pressure 7. Prevent receiver pressure from backing up into a cold condenser 8. Prevent liquid returning to compressor during shutdown 9. Prevent liquid from flowing down into drain pan 10. Prevent reverse flow in suction line due to unusual load conditions	Any position **NOTE: Not** recommended for side port applications on screw compressors
CK1	20-150mm (¾" - 6")	1. Slow speed compressor discharge lines 2. Liquid lines 3. Suction lines down to -30°C (-25°F) 4. Side port applications on screw compressors	Horizontal lines with opening stem in the vertical position
CK3	1/2 to 1 FPT	1. Hot gas lines from pan to evaporator 2. Liquid lines	Any position

- UL Listed (Thru 3" Size)
- Installs in any position
- Compact and lightweight
- In-Line flanged valves
- Design Pressure (MRP): 34.5 bar (500 psi)



Description

These compact valves are spring closing with a lapped, stainless steel or chrome plated seat for positive closing action and low leakage. A minimum pressure difference of 0.05 bar (0.75 psi) is required to hold the valve in the open position. Removable seat plate with combination O-ring and metal-to-metal knife edge seal allows the valve to be disassembled for maintenance. They may be ordered with a male adapter ring for close-coupling to other Refrigerating Specialties valves and may be installed in any position.

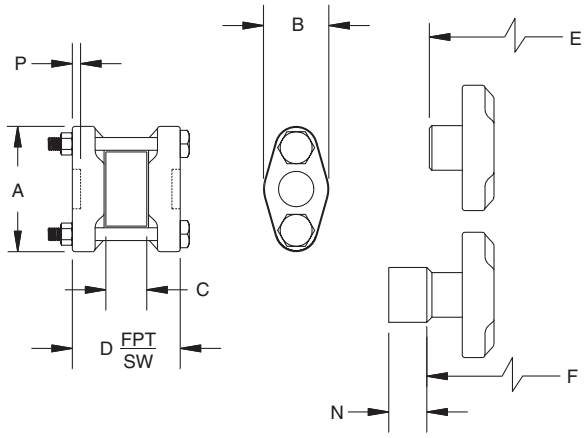
Materials

Body ..... Steel (15mm), Ductile Iron (20-200mm)
Seat ..... Stainless steel

Specifications

Design Pressure (MRP) ..... 34.5 bar (500 PSI)
Fluid Temperature Range ..... -55° to 105°C (-60° to 220°F)
Flow Coefficients:

13 mm (½") ..... 2.9 Kv (3.4 Cv)
20 mm (¾") ..... 6.1 Kv (7.1 Cv)
25 mm (1") ..... 11 Kv (13 Cv)
32 mm (1¼") ..... 16 Kv (19 Cv)
50mm (2") ..... 40 Kv (46 Cv)
65mm (2½") ..... 60 Kv (70 Cv)
75mm (3") ..... 96 Kv (112 Cv)
100mm (4") ..... 180 Kv (210 Cv)
125mm (5") ..... 240 Kv (280 Cv)
150mm (6") ..... 389 Kv (455 Cv)
200mm (8") ..... 670 Kv (783 Cv)



13 - 100mm Size

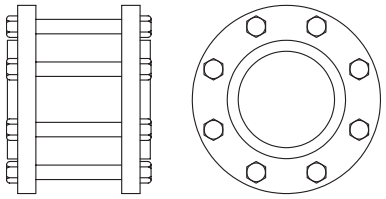
Dimensions

Dimension		PORT SIZE																		
		13mm (1/2')			20-25mm (3/4 - 1')				32mm (1-1/4')			50mm (2')			65mm (2-1/2')		75mm (3')		100m (4')
A	mm	75			113				95			114			148		148		179	
	inch	29.3			4.43				3.75			4.50			5.81		5.81		7.06	
B	mm	38			62				95			114			148		148		179	
	inch	1.50			2.43				3.75			4.50			5.81		5.81		7.06	
C	mm	27			32				50			60			70		81		89	
	inch	1.06			1.25				2			2.37			2.75		3.19		3.50	
D	mm	63			59				79			114			145		157		177	
(FPT, SW)	inch	2.47			2.32				3.10			4.47			5.72		6.16		6.97	
Conn. Size		**3/8, 1/2, 3/4**			**3/4"**	**1"**		**1-1/4"**	**1-1/4"**		**1-1/2"**	**1-1/2"**		**2"**	**2-1/2"**		**3"**		**4"**	
E	mm	82			97	117		117	126		136	171		177	215		245		298	
	inch	3.22			3.82	4.61		4.61	4.97		5.35	6.72		6.97	8.47		9.66		11.72	
Conn. Size		**1/2**	**5/8**	**7/8**	**7/8**	**1-1/8**	**1-3/8**	**1-5/8**	**1-3/8**	**1-5/8**	**2-1/8**	**1-5/8**	**2-1/8**	**2-5/8**	**2-5/8**	**3-1/8**	**3-1/8**	**3-5/8**	**4-1/8**	
F	mm	76	82	98	99	193	99.5	111	119	130	159	193	177	205	203	250	228	248	285	
	inch	2.98	3.22	3.85	3.88	4.07	3.91	4.36	4.69	5.12	6.26	7.57	6.95	8.08	7.98	9.82	8.95	9.76	11.2	
N	mm	9	13	29	20	24	25	28	25	28	34	28	34	37	37	42	42	48	55	
	inch	.37	.50	.75	.75	.93	.96	1.09	.96	1.09	1.34	1.09	1.34	1.46	1.46	1.65	1.65	1.90	2.15	
P	mm	13			13				15			15			25		29		32	
	inch	.50			.50				.60			.60			1.0		1.1		1.3	

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

Dimensions

Nominal Pipe Size	Valve Length		Valve Diameter		Flange Outside Diameter		Diameter of Bolt Circle		# of Bolts
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	
125 mm (5")	4.125	104.8	8.375	212.7	11	279	9.25	235	8
150 mm (6")	4.625	117.5	9.750	247.7	12.5	318	10.62	270	12
200 mm (8")	5.625	142.9	12.000	304.8	15	381	13.00	330	12



125 - 200mm Size

How to Order

Type CK4 solenoid valves can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Inlet Flange	Outlet Flange
050	CK4	F12	F12

Not all flange types and connections are available for each port size. See Flange Availability table for allowable combinations.

Port Size	
013	13mm (½")
020	20mm (¾")
025	25mm (1")
032	32mm (1¼")
050	50mm (2")
065	65mm (2½")
075	75mm (3")
100	100mm (4")
125	125mm (5")
150	150mm (6")
200	200mm (8")

Flange Type		Connection	
X	Less Flanges	**00**	None
R	Less Flanges, w/Male Adapter Ring		
F	FPT (IPS)	**02★**	¼"
S	SW (IPS)	**03**	3/8
W	Weld Neck (IPS)	**04**	½"
		06	¾"
		08	1"
		10	1¼"
		12	1½"
		16	2"
		20	2½"
		24	3"
		32	4"
★ FPT only.			

Flange Type		Connection	
K	ODS (US)	**04**	½"
		05	5/8"
		07	7/8"
		09	1 1/8"
		11	1 3/8"
		13	1 5/8"
		17	2 1/8"
		21	2 5/8"
		25	3 1/8"
		29	3 5/8"
		33	4 1/8"
	Not suitable for use with ammonia.		
D	DIN Weld Neck	Enter size in mm from table below.	
M	Insert Metric		
C	EC-Br Copper		
Y	ANSI Slip-On (IPS)	**40**	5"
		48	6"
Z	ANSI Weld Neck (IPS)	**64**	8"

Flange Availability & Weights

Table shows flange size codes available by flange type for each port size code

Port Code	Flange Connections Available						Weight			
	FPT (IPS)	Socket Weld (IPS) Weld Neck (IPS)	ODS (US)	DIN Weld Neck	Insert Metric	EC-Br Copper	Less Flanges		With Flanges	
							kg	lb	kg	lb
013	02 03 04 06	03 04 06	04 05 07	10 15 20			0.5	1	0.9	2
020	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	0.9	2	2.3	5
025	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	0.9	2	2.3	5
032	10 12	10 12	11 13 17	32 40 50		30 36 42	2.5	5	3	8
050	12 16	12 16	13 17 21	40 50			3.2	7	5.9	13
065		20	21 25	65 75			5.4	12	10	22
075		24	25 29	75			7.3	16	12	26
100		32	33	A0			15	34	24	53

Port Code		300# ANSI Flange Connections Available (150# available for certain applications. Consult factory.)		Weight			
				Less Flanges		With ANSI Flanges	
mm	inch	Slip-on (IPS)	Weld Neck (IPS)	kg	lbs	kg	lbs
125	5"	40	40	20	45	50	110
150	6"	48	48	28	62	67	147
200	8"	64	64	44	96	105	231

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

- Rugged, Heavy Duty
- Low Pressure Drop
- Piston Type Gravity Closing
- Flanged, horizontal mounting
- Design Pressure(MRP): 27.6 bar (400 psig)
- Manual Opening Stem

Description

These piston type, gravity closing, heavy duty check valves are suitable for Ammonia, R-22, R-134a, R-404A, R-507, other refrigerants, certain oils and other fluids approved for use in refrigeration. All CK1 check valves are flanged and are suitable for mounting only in horizontal lines with opening stem in the vertical position. They have a manual opening stem for manual operation. They may be ordered with a male adapter ring (through 4" size) for close coupling. A minimum pressure difference of .03 bar (0.5 psi) is required to open the valve.

Materials

Body ..... Gray Iron

Seat ..... PTFE (20-32mm), Metal (40-150mm)

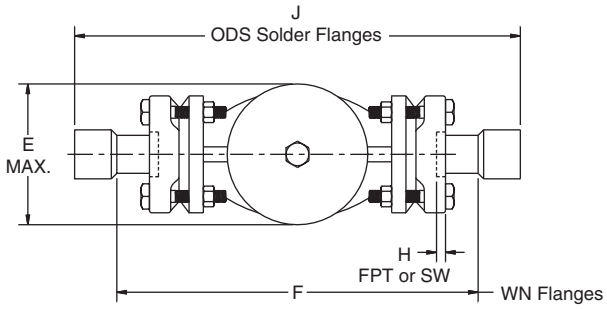
Specifications

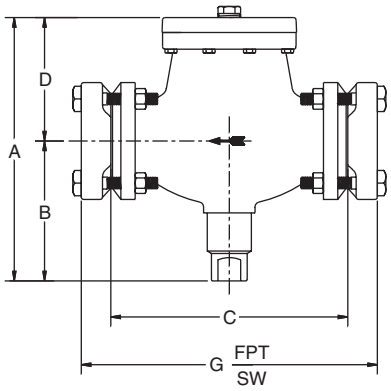
Design Pressure (MRP) ..... 27.6 bar (400 PSI)

Fluid Temperature Range ..... -30° to 105°C (-25° to 220°F)

Flow Coefficients:

20 mm (¾") ..... 8.1 Kv (9.5 Cv)
25 mm (1") ..... 8.6 Kv (10 Cv)
32 mm (1¼") ..... 16 Kv (19 Cv)
40mm (1⅝") ..... 32 Kv (37 Cv)
50mm (2") ..... 44 Kv (51 Cv)
65mm (2½") ..... 70 Kv (82 Cv)
75mm (3") ..... 103 Kv (120 Cv)
100mm (4") ..... 171 Kv (200 Cv)
125mm (5") ..... 244 Kv (285 Cv)
150mm (6") ..... 342 Kv (400 Cv)





Dimensions

DIMENSIONAL DATA																			
PORT SIZE		A		B		C		D		E		F		G		H		J	
mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
20, 25	¾, 1	191	7.5	102	4.0	158	6.2	89	3.5	117	4.6	239	9.4	216	8.5	13	.5	265	10.4
32	1¼	219	8.6	122	4.8	203	8.0	96.5	3.8	117	4.6	305	12.0	256	10.1	15	.6	320	12.6
40, 50	1⅝, 2	270	10.6	139.7	5.5	251	9.9	129.5	5.1	129.5	5.1	371	14.6	307	12.1	15	.6	414	16.3
65	2½	303	11.9	142.2	5.6	251	9.9	160	6.3	147.3	5.8	401	15.8	331	13.0	25	1.0	424	16.7
75	3	384	15.1	216	8.5	311	12.2	167.6	6.6	167.6	6.6	478	18.8	389	15.3	29	1.1	500	19.7
100	4	427	16.8	217	8.6	366	14.1	208.3	8.2	190.5	7.5	571	22.5	450	17.7	32	1.3	615	24.2
125	5	496	19.5	298.4	11.7	381	15.0	198.1	7.8	228.6	9.0	576.6	22.7	485	19.1	30.5	1.2	—	—
150	6	537	21.1	355.6	14.0	514.3	20.2	180	7.1	294.6	11.6	706.1	27.8	617	24.3	35.6	1.4	—	—

How to Order

Type CK1 check valves can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Inlet Flange	Outlet Flange	Strainer
050	CK1	F12	F12	S

Not all flange sizes are available for each port size. See Flange Availability table for allowable combinations.

Port Size

020	20mm (¾")
025	25mm (1")
032	32mm (1¼")
040	40mm (1⅝")
050	50mm (2")
065	65mm (2½")
075	75mm (3")
100	100mm (4")
125	125mm (5")
150	150mm (6")

Flange Type	Connection
X Less Flanges **R** Less Flanges, w/Male Adapter Ring	**00** None
F FPT (IPS) **S** SW (IPS) **W** Weld Neck (IPS)	**06** ¾" **08** 1" **10** 1¼" **12** 1½" **16** 2" **20** 2½" **24** 3" **32** 4" **40** 5" **48** 6"
K ODS (US)	**07** 7/8" **09** 1 1/8" **11** 1 3/8" **13** 1 5/8" **17** 2 1/8" **21** 2 5/8" **25** 3 1/8" **29** 3 5/8" **33** 4 1/8"
D DIN Weld Neck **M** Insert Metric **C** EC-Br Copper	Enter size from table below.

Strainer

N	No Strainer
S	w/Strainer

⚠ WARNING!
ODS flanges not suitable for use with ammonia.

Flange Availability & Weights

Table shows flange size codes available by flange type for each port size code

Port Code	Flange Connections Available						Weight			
	FPT (IPS)	Socket Weld (IPS) Weld Neck (IPS)	ODS (US)	DIN Weld Neck	Insert Metric	EC-Br Copper	Less Flanges		With Flanges	
							kg	lb	kg	lb
020	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	4.5	10	5.9	13
025	06 08 10	06 08 10	07 09 11	20 25 32	20 25 32	18 20 26 30	5.0	11	6.4	14
032	10 12	10 12	11 13 17	32 40 50		30 36 42	10	22	12	26
040	12 16	12 16	13 17 21	40 50			21	47	24	53
050	12 16	12 16	13 17 21	40 50			21	47	24	53
065		20	21 25	65 75			28	62	33	72
075		24	25 29	75			42	92	45	102
100		32	33	A0			62	136	70	154
125		40					109	239	137	279
150		48					182	400	200	440

Parker Climate & Industrial Controls

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

- Small, Compact, Heavy Duty
- Heavy Spring Closing
- Installs in any position
- PTFE Seat
- Threaded Ends
- Maximum Rated Pressure (MRP): 27.6 bar (400 psig)

Description:

This compact, heavy duty, threaded in-line check valve is suitable for Ammonia, R-22, R-134a, R-404A, R-507 and other refrigerants, certain oils and other fluids approved for use in refrigeration.

The CK3 is spring closing and can be installed in any position. The CK3 is available with 1/2", 3/4", and 1" FPT connections.

Materials

Body ..... Zinc-plated Steel
Seat ..... PTFE

Specifications

Design Pressure (MRP) ..... 27.6 bar (400 PSI)
Fluid Temperature Range ... -30° to 105°C (-25° to 220°F)
Flow Coefficients:
½" ..... 8.1 Kv (9.5 Cv)
¾" ..... 9.0 Kv (10.5 Cv)
1" ..... 9.8 Kv (11.5 Cv)

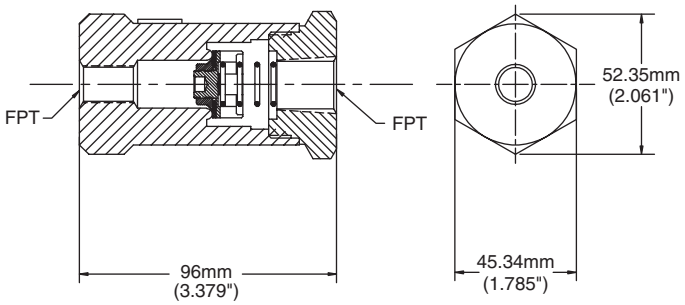
How to Order

Type CK3 check valves can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

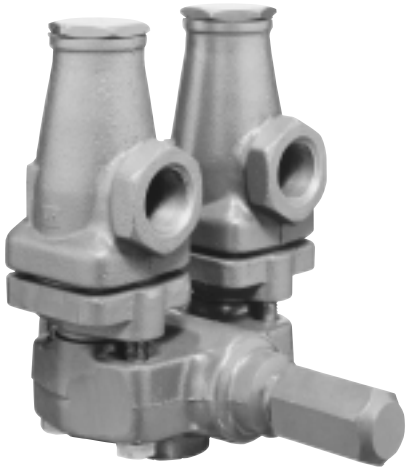
Port Size	Type
06	CK3

Port Size	
04	½" Female NPT
06	¾" Female NPT
08	1" Female NPT

Dimensions



- For use with R-22, R-717 and other common refrigerants
- High Capacity
- Excellent Repeatability
- Unaffected by Vibration
- Drain Plug Standard



Type H Valves on Type M Manifold

Description

The **Type H** High Capacity Safety Relief Valves are designed and constructed to meet the requirements of ASME Boiler and Pressure Vessel Code and ANSI/ASHRAE 15-78 Code requirements and bear the ASME Code Symbol (UV) indicating compliance with these codes. Employing proven principles of design, these Safety Relief Valves are highly reliable and dependable. Precision machined moving parts of stainless steel, a PTFE disc and a cadmium-plated spring prevent sticking due to corrosion or cold welding, to assure valve opening at the set pressure long after installation. They are not suitable for corrosive ambient atmospheres such as chlorine, etc. The two-bolt flanged bottom inlet affords simple removal and replacement.

Two relief valves can be mounted on a **Type M** Dual Stop Valve Manifold. This arrangement permits either valve to be shut off individually and removed for repairs or inspection. Thus, one valve is always in service as required by most codes.

The high capacity of the Type H valve permits the use of a small size valve which results in space saving. The valves are very sturdy and compact, requiring small headroom. The dual valve manifold assembly is especially compact and easily assembled.

Materials

Body ..... Gray Iron
Internal Parts ..... Stainless Steel
Seat ..... PTFE

Specifications

Maximum Temperature ..... 150°C (300°F)

See page 67 for capacities.

Application

Used with ammonia and halocarbon refrigerants in noncorrosive environments, Relief Valves protect each refrigeration system pressure vessel that can be isolated by valves.

Codes require valve settings equal to or less than the design working pressure (DWP) of the vessel to be protected. Pressure settings are set and sealed at the factory.

Selection Data

The Type H safety relief valve is intended to prevent the pressure of the vessel from rising more than 10% above (1) the design working pressure (DWP) of the vessel or (2) the pressure setting of the relief device, whichever is the lower pressure.

Whenever conditions permit, it is advisable to have the relief valve pressure setting at least 25% higher than the normal operating pressure for the refrigerant used. ***The relief valve pressure setting must not exceed the design working pressure of the vessel.***

Pressure limiting devices, such as high pressure cutouts on positive displacement compressor systems, must stop the action of the pressure imposing element at no higher than 90% of the pressure setting for the pressure relief device.

On non-positive displacement compressors, pressure limiting devices – such as high pressure cutout – may be set at the design working pressure (DWP) of the high side, provided:

1. The low side is protected by a properly sized pressure relief device set at the low side DWP and
2. There are not stop valves in the system that isolate the high side from the low side.

Discharge piping from relief devices must not exceed lengths specified in ANSI/ASHRAE 15-78 with discharge to atmosphere.

Per ANSI/ASHRAE 15-78, the minimum required discharge capacity of a relief device for each pressure vessel where the vessel is valved off from the refrigerating systems is determined as follows:

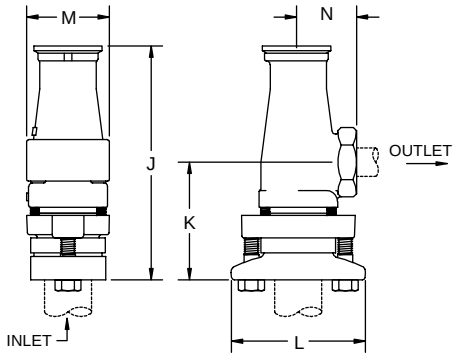
C = FDL, where:
C = capacity, lb/min air
F = a factor from the table below
D = outside diameter of the vessel in feet
L = length of vessel in feet

Refrigerant	Factor (F)
R-717	0.5
R-22	1.6
Consult factory for other refrigerants.	

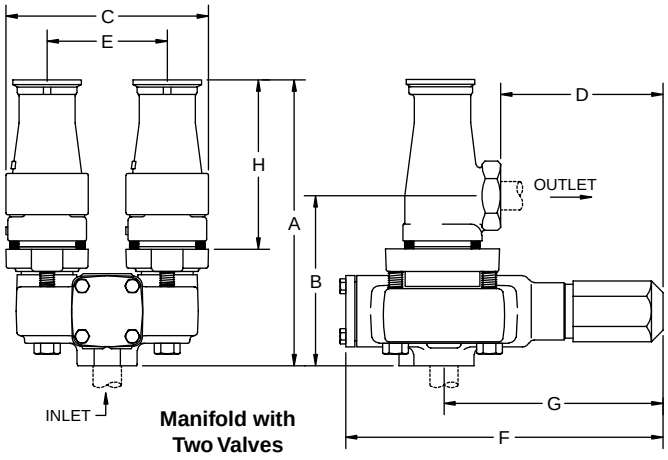
Refer to Bulletin 70-01.

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

Dimensions



Single Valve



Manifold with Two Valves

Dimension	H2		H3		H4		H5	
	mm	inch	mm	inch	mm	inch	mm	inch
A	251	9.87	295	11.62	340	13.37	371	14.62
B	152	6.00	187	7.37	211	8.31	224	8.81
C	171	6.75	219	8.62	273	10.75	318	12.50
D	137	5.37	127	5.00	117	4.62	111	4.37
E	102	4.00	127	5.00	165	6.50	165	6.50
F	273	10.75	283	11.12	298	11.75	298	11.75
G	187	7.37	188	7.41	192	7.56	192	7.56
H	166	6.53	202	7.97	237	9.34	266	10.46
I	193	7.59	229	9.03	267	10.53	296	11.65
K	96	3.77	120	4.72	137	5.40	151	5.93
L	102	4.00	102	4.00	122	4.81	122	4.81
M	70	2.75	92	3.62	108	4.25	152	6.00
N	49	1.94	62	2.43	75	2.94	81	3.19
Inlet	20	¾	25	1	32	1¼	32	1¼
Outlet	25	1	32	1¼	40	1½	50	2

Companion Mounting Flange (Male)

Size Oval Flange Tongue Pattern	Inlet Connection	Type Valve Applicable
½"	¾" FPT	H2
¾"	1" FPT	H3
1¼"	1¼" FPT	H4, H5
1¼"	1½" FPT	H4, H5

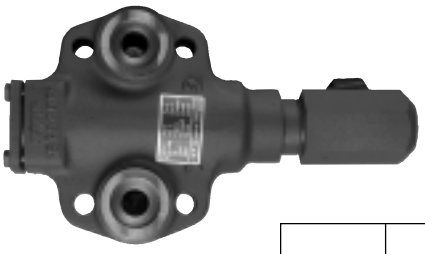
Note: Flange with bolts only. Gaskets supplied with Relief Valve.

Companion Mounting Flange (Female)

Size Oval Flange Tongue Pattern	Inlet Connection	Type Valve Applicable
½"	¾" FPT	H2
¾"	1" FPT	H3
1¼"	1¼" FPT	H4, H5
1¼"	1½" FPT	H4, H5

Note: Flange with bolts only. Gaskets supplied with Relief Valve.

Dual Stop Valve Manifold



Type	Bottom Inlet Connection Size
M2	¾" FPT
M3	1" FPT
M4	1½" FPT

Note: Bolts supplied with manifold.

Specifications

Note:
Pressure settings and capacities apply only when the valve is discharging to atmospheric pressure.

SINGLE VALVE ONLY						MANIFOLD FOR TWO VALVES	
Connections				Capacity		Connections	
Valve Type	Companion Mounting Flange (Inlet)	Relief Valve Outlet FPT	Pressure Setting (psig)	Lbs. Per Min Air	SCFM Air	Manifold Inlet Bottom	Relief Valve Outlet
H2	**½" Port** Provides ¾" FPT	1" FPT	50 75 100 125 150 175 200 225 250 275 300	23 32 41 50 60 69 78 87 96 105 114	302 422 541 661 780 899 1019 1138 1257 1377 1496	**Type M2** Manifold Provides ¾" FPT	1" FPT
H3	**¾" Port** Provides 1 " FPT	1¼" FPT	50 75 100 125 150 175 200 225 250 275 300	38 53 68 83 98 113 128 143 158 173 188	498 694 890 1087 1283 1479 1676 1872 2068 2265 2461	**Type M3** Manifold Provides 1" FPT	1¼" FPT
H4	**1" Port** Provides 1¼" FPT	1½" FPT	50 75 100 125 150 175 200 225 250 275 300	57 79 101 124 146 169 191 213 236 258 281	744 1037 1330 1624 1917 2211 2504 2798 3091 3385 3678	**Type M4** Manifold Provides 1½" FPT	1½" FPT
H5	**1¼" Port** Provides 1¼" FPT	2"	50 75 100 125 150 175 200 225 250 275 300	95 132 170 207 244 282 319 357 394 431 469	1242 1732 2222 2712 3202 3692 4182 4672 5162 5653 6143	**Type M4** Manifold Provides 1½" FPT	2" FPT

How to Order

Safety relief valves and manifolds can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Type	Inlet Flange	Connection Size		Pressure Setting
H2	**1**	**1**	–	**100**

Type (See Table Above)

H2	H2 Valve
H3	H3 Valve
H4	H4 Valve
H5	H5 Valve
M2	M2 Manifold
M3	M3 Manifold
M4▲	M4 Manifold

▲ Fits H4 & H5 Valves

Inlet Flange

X	Less Flange
1★	Male Companion Flange
2▲	Female Companion Flange
3▲	Male plus Female Companion Flanges

★ For Single Valves only.
▲ For Mainfolds only.

Connection Size

0	Less Flange
2	3/4" FPT (H2 only)
3	1" FPT (H3 only)
4	1¼" FPT (H4 & H5 only)
5	1½" FPT (H4 & H5 only)

◆ Standard settings shown. Other settings between 50 and 300 PSI are available at additional cost.

Pressure Setting◆

Blank	Manifold	
50	50 PSI	3.5 Bar
75	75 PSI	5.2 Bar
100	100 PSI	6.9 Bar
125	125 PSI	8.6 Bar
150	150 PSI	10.3 Bar
175	175 PSI	12.1 Bar
200	200 PSI	13.8 Bar
225	225 PSI	15.5 Bar
250	250 PSI	17.2 Bar
275	275 PSI	19.0 Bar
300	300 PSI	20.7 Bar

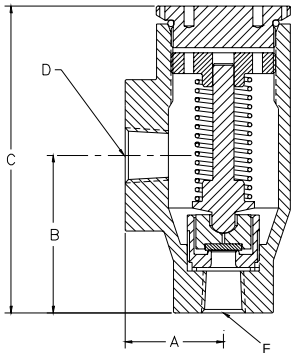
- For use with R-22, R-717, R507 and other common refrigerants
- Designed to ASME VIII, ASHRAE and IIAR standards
- Excellent repeatability
- Unaffected by vibration
- Pressure relief settings from 10.3 - 27.6 bar (150 - 400 psig)

Description

Parker Refrigerating Specialties has developed a family of low capacity safety relief valves to comply with the newly drafted ANSI/ASHRAE 15 safety code for mechanical refrigeration. The low capacity **SR Safety Relief Valve** meets the requirements for new installation and municipal ordinances. Precision machined moving parts of stainless steel and a PTFE disc prevent sticking due to corrosion or cold welding, to assure valve opening at the set pressure long after installation.

See Selection Data on page 65.

Refer to Bulletin 71-00.



Dimensions

Size	A	B	C	D	F
SR1	1.562	2.50	5.05	¾" FPT	½" FPT
SR2	1.562	2.50	5.05	1" FPT	½" FPT
SR3	1.875	3.00	5.92	1¼" FPT	¾" FPT
SR4	1.875	3.00	5.92	1½" FPT	¾" FPT

Capacities

Size	Pressure Setting psig	Lbs. per Min air	SCFM Air
SR1	150	10	130
	200	13	170
	250	16	210
	300	19	250
	350	22	290
	400	25	329
SR2	150	19	246
	200	25	321
	250	30	397
	300	36	472
	350	42	547
	400	48	622
SR3	150	29	377
	200	38	493
	250	46	608
	300	55	724
	350	64	839
	400	73	955
SR4	150	37	491
	200	49	641
	250	60	791
	300	72	945
	350	83	1091
	400	94	1241

Manifold

Type M1 manifolds designed to ASME VIII, ASHRAE and IIAR standards are available for use with SR/SRH valves. See following page for dimensions.

1/2" inlet ..... Part Number 107107
3/4" inlet ..... Part Number 107108

Accessories

Rupture disc assemblies, pressure transducer, pressure switch and Teltale pressure gauge are available for the SR Series valves. Consult factory for details.

How to Order

Safety relief valves can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Type	Connection Sizes		Pressure Setting
SR	**1**	–	**300**

Connection Size

1	1/2" FPT inlet, 3/4" FPT outlet
2	1/2" FPT inlet, 1" FPT outlet
3	3/4" FPT inlet, 1¼" FPT outlet
4	3/4" FPT inlet, 1½" FPT outlet

Pressure Setting

150	150 PSI	10.3 Bar
200*	200 PSI	
250	250 PSI	17.2 Bar
300	300 PSI	20.7 Bar
350*	350 PSI	
400	400 PSI	27.6 Bar

* Non-standard setting; available at additional cost.

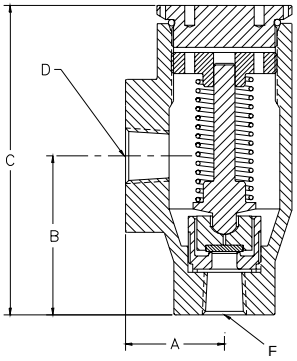
- For use with R-22, R-717, R507 and other common refrigerants
- Designed to ASME VIII, ASHRAE and IIAR standards
- Excellent repeatability
- Unaffected by vibration
- Pressure relief settings from 10.3 - 27.6 bar (150 - 400 psig)

Description

High capacity **SRH Safety Relief Valves** are designed and constructed to meet the requirements of Section VIII ASME Boiler and Pressure Vessel Code and ANSI/ASHRAE 15-78. Designed to address the large installed population of safety relief valves, they are direct replacement for competing products.

See Selection Data on page 65.

Refer to Bulletin 72-00.



Dimensions

Size	A	B	C	D	F
SRH1	1.562	2.50	5.05	¾" FPT	½" FPT
SRH2	1.562	2.50	5.05	1" FPT	½" FPT
SRH3	1.875	3.00	5.92	1" FPT	¾" FPT

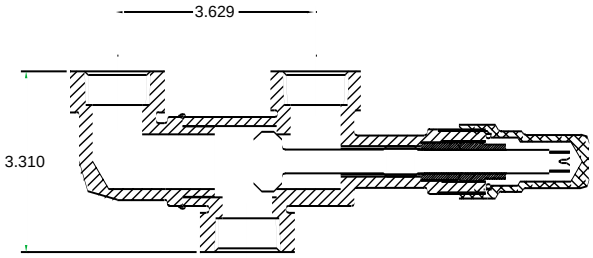
Capacities

Size	Pressure Setting, psig	Lbs. per Min air	SCFM Air
All	150	35	463
	200	46	605
	250	57	747
	300	68	889
	350	79	1031
	400	89	1173

Manifold

Type M1 manifolds designed to ASME VIII, ASHRAE and IIAR standards are available for use with SR/SRH valves.

1/2" inlet ..... Part Number 107107
3/4" inlet ..... Part Number 107108



Accessories

Rupture disc assemblies, pressure transducer, pressure switch and Teltale pressure gauge are available for the SRH Series valves. Consult factory for details.

How to Order

Safety relief valves can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Type	Connection Sizes		Pressure Setting
SRH	**1**	–	**300**

Connection Size	
1	1/2" FPT inlet, 3/4" FPT outlet
2	1/2" FPT inlet, 1" FPT outlet
3	3/4" FPT inlet, 1" FPT outlet

Pressure Setting		
150	150 PSI	10.3 Bar
200*	200 PSI	
250	250 PSI	17.2 Bar
300	300 PSI	20.7 Bar
350*	350 PSI	
400	400 PSI	27.6 Bar

* Non-standard setting; available at additional cost.

Parker Climate & Industrial Controls
Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

- Suitable for fluorocarbon refrigerants (R-22, R-134a, R-404A, R-507 and others), ammonia (R-717), nitrogen and carbon dioxide.
- Excellent flow coefficient – low pressure drop
- Handwheel and seal cap interchangeable on all valves
- Available as hand expansion valve in sizes up to 2" for socket weld and 1½" for threaded connection
- Same price for hand wheel or seal cap, globe or angle type, hand expansion or standard valve
- Save insulation cost

Operating Specifications

Design Pressure (MRP) ..... 27.6 Bar (400 psig)
Fluid Temperature Range ..... -45°C to +204°C (-50°F to +400°F)

For Hand Shut-Off Valves, refer to Bulletin 80-01.

For Hand Expansion Valves, refer to Bulletin 82-00.

General Specifications

Size	¼", ⅜", ½"	¾", 1", 1¼", 1½"	2", 2½", 3", 4", 5", 6", 8"	10", 12"
Body Type	Angle and Globe	Angle and Globe	Angle and Globe	Angle and Globe
Connections	Threaded and Socket Weld	Threaded and Socket Weld	Socket Weld and Butt Weld	Butt Weld
Body Material	Cast Steel	Cast Steel	Cast Steel	Cast Steel
Bonnet Material	Forged Steel	Forged Steel	Ductile Iron	Fabricated Steel
Packing Material	Non-Asbestos Graphite	Non-Asbestos Graphite	Non-Asbestos Graphite	Non-Asbestos Graphite
Seat Material	25% CarbonFilled PTFE	25% CarbonFilled PTFE	25% CarbonFilled PTFE	25% CarbonFilled PTFE

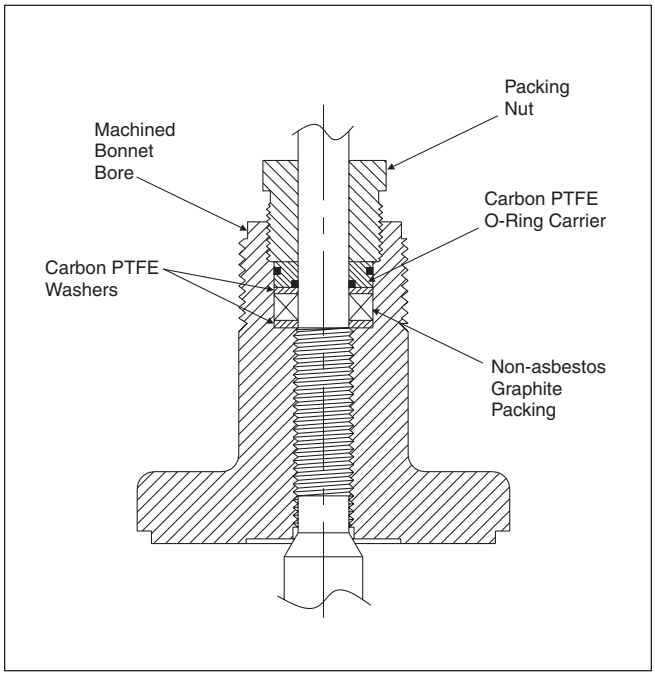
Flow Coefficients and Weights

		Flow Coefficients						Weights					
Valve Size		Globe "T"		Globe "Y"		Angle		Globe "T"		Globe "Y"		Angle	
mm	inches	Kv	Cv	Kv	Cv	Kv	Cv	kg	lb	kg	lb	kg	lb
6	¼	2.2	2.6	—	—	3.1	3.6	1	2.2	—	—	1	2.2
10	⅜"	3.5	4.1	—	—	4.7	5.5	1	2.2	—	—	1	2.2
13	½"	6.2	7.2	—	—	6.9	8.0	1.1	2.4	—	—	1.1	2.4
20	¾"	12	14	—	—	14.6	17	1.8	4.0	—	—	1.8	4.0
25	1"	18.9	22	—	—	23.2	27	1.8	4.0	—	—	1.8	4.0
32	1¼"	25.8	30	40.5	53	30.1	35	4.2	9.2	4.2	9.2	4.2	9.2
38	1½"	35	43	45.6	53	40	46	4.5	10	4.5	10	4.5	10
50	2"	52	61	80	92.6	73	85	6.5	14.4	6.5	14.4	6.5	14.4
65	2½"	89	103	131	153	128	149	9.5	21	9.5	21	9.5	21
75	3"	98	114	179	208	180	208	20	45	15	33	15	33
100	4"	173	202	292	340	292	340	34	74	22	47	18	40
125	5"	—	—	716	718	716	718	—	—	45	98	34	75
150	6"	—	—	788	916	788	916	—	—	80	132	45	99
200	8"	—	—	1244	1446	1244	1446	—	—	116	255	87	192
254	10"	—	—	2133	2480	2133	2480	—	—	199	417	142	313
305	12"	—	—					—	—	204	450	153	337

- ASTM 352 LCB Cast Steel Body (1/4" thru 12")
- Stainless Steel Stem
- Optional Stainless Steel Trim
- Reliable Back Seating
- Bolted Bonnets (1/4" thru 12")
- 25% Carbon Filled PTFE Seat Material
- Linear Flow "Y" Pattern Globe Body (1-1/4" thru 12") for Low Pressure Drop
- Extended Bonnets for Thicker Insulation
- Handwheel and Seal Cap Interchangeable on Same Valve

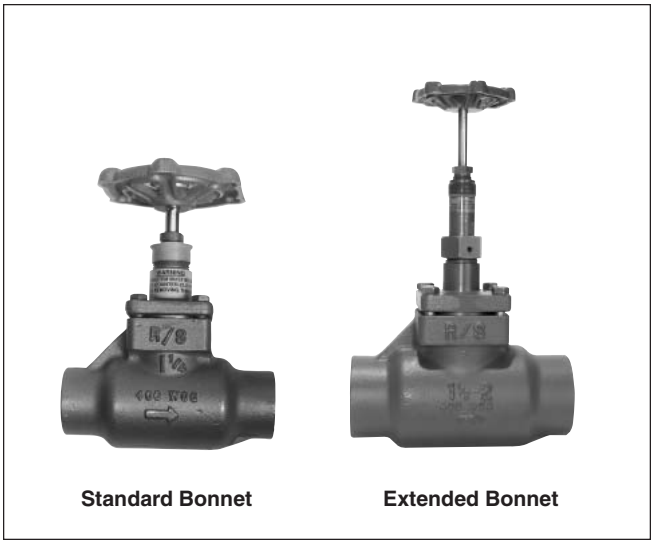
Description

This complete line of steel bodied valves with bolt-on bonnets is designed and built to maintain reliability both in the seating and back seating functions. This entire line is supplied with stainless steel stems and backseating capability. Corrosion resistant, high-grade stainless steel trim is available upon request. A unique carbon filled PTFE seat is standard throughout the line, lending durability to the seating surface. In addition a dual O-ring stem packing design along with a stem packing seal is standard on all valves from 1/4" thru 12". This innovative design seals both the valve stem and bonnet bore with independent O-rings, which are captured in a carbon PTFE carrier. The addition of the packing provides for backup sealing capability in the unlikely event of an O-ring failure.



Trim Options

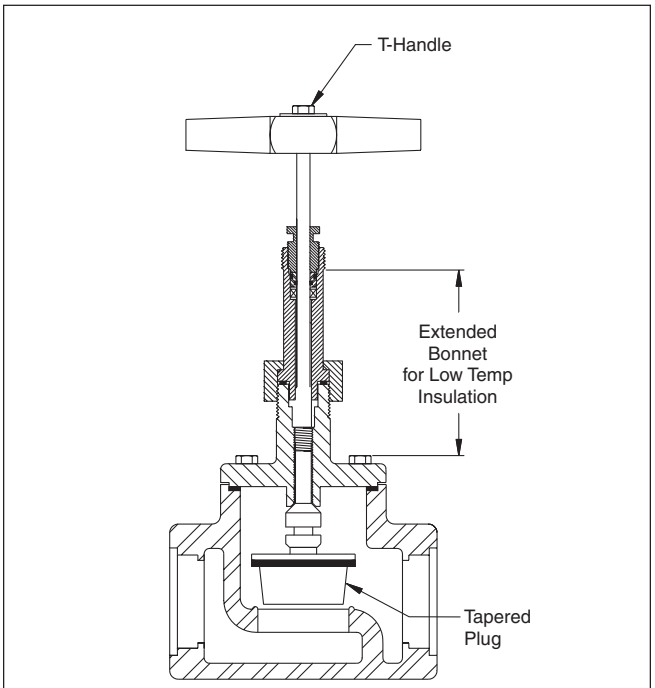
Standard mild steel trim includes Grade 5 Steel bonnet bolts, mild steel packing nut and Type 304 Stainless stem. The stainless steel trim option utilizes 316 Stainless Steel bonnet bolts, packing nut and stem to provide corrosion resistance for selected exposed parts.



Standard Bonnet **Extended Bonnet**

Extended Bonnet

An extended bonnet is available for selected sizes and styles of hand valves (see Availability Table). This design supports 3" thick insulation above bonnet bolts for valves through 3" size and 4" thick insulation for 4" size valves. All extended bonnet valves incorporate 316 Stainless Steel bonnet bolts, stem, packing nut, extension boss and boss retainer.



Hand Expansion Valve

Hand Expansion Valves

Hand expansion valves are the same as shut-off valves except they feature a tapered plug for throttling action. Handle options are a T-handle or seal cap.

How to Order

Hand valves can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Port Size	Type	Connection Style	Body Style	Trim Option	Operator Option
050	HS	F	T	T	S

Note: *Port sizes are not available in every body style. Refer to chart below for available combinations.*

Port Size

006	6mm (¼")
010	10mm (⅜")
013	13mm (½")
020	20mm (¾")
025	25mm (1")
032	32mm (1¼")
038	38mm (1½")
050	50mm (2")
065	65mm (2½")
075	75mm (3")
100	100mm (4")
125	125mm (5")
150	150mm (6")
200	200mm (8")
254	250mm (10")
305	304mm (12")

Valve Type

HE*	Hand Expansion
HS	Hand Shut-Off

* Available in port sizes 006 to 050 only.

Connection

F	FPT
B	Butt Weld
S	Socket Weld

Body Style

A	Angle
T	Globe "T"
Y	Globe "Y"

Trim Options

N	None
T	Stainless Steel Trim (Standard Bonnet)
E*	Extended Bonnet and Stainless Steel Trim

* Not available with Globe "Y" body and selected sizes in other body styles. Refer to chart below.

Handle Options

H	Handwheel (Type HS only)
S	Seal Cap
T	T-Handle (Type HE only)
C	Handwheel with Chain

Body and Connection Availability

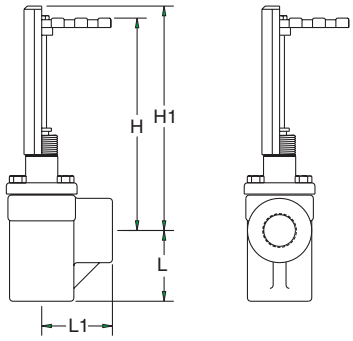
Table shows body and connection styles available for each port size code.
Hand expansion valves are not available in sizes within the shaded area.

Port Code	FPT		Socket Weld			Butt Weld		
	Angle	Globe "T"	Angle	Globe "T"	Globe "Y"	Angle	Globe "T"	Globe "Y"
006	★	★	★	★				
010	★	★	★	★				
013	●	●	●	●				
020	●	●	●	●				
025	●	●	●	●				
032	●	●	●	●	★	●		★
038	●	●	●	●	★	●		★
050			●	●	★	●		★
065			●	●	★	●		★
075			●		★	●	●	★
100			●		★	●	●	★
125						★		★
150						★		★
200						★		★
254						★		★
305						★		★

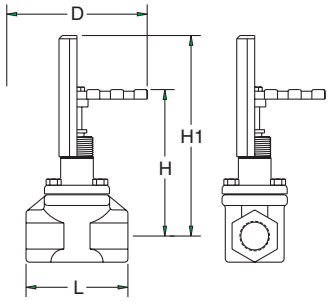
★ Not available with extended bonnet.

Dimensions on next pages.

Threaded Connection (FPT), Standard Bonnet



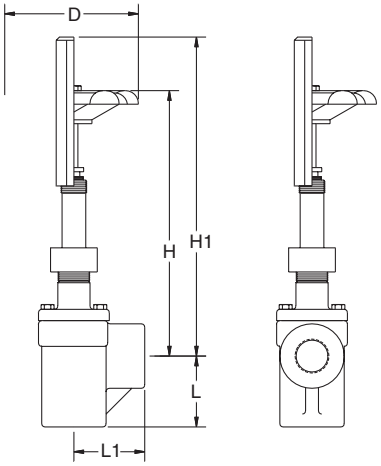
Angle



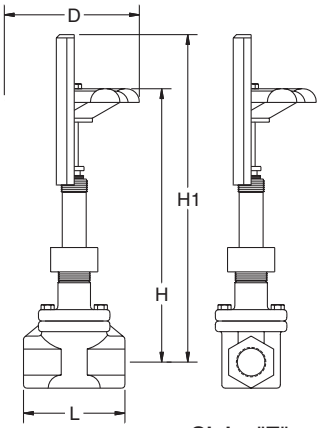
Globe "T"

Valve Size	Angle					Globe			
	L	L1	H	H1	D	L	H	H1	D
1/4", 3/8", 1/2"	1.75	1.75	4.50	6.00	2.50	3.75	5.75	6.88	2.50
3/4", 1"	1.50	2.00	5.75	6.50	4.00	3.88	5.75	6.50	4.00
1¼", 1½"	1.63	2.50	8.00	8.50	5.40	5.00	8.00	8.50	5.40

Threaded Connection (FPT), Extended Bonnet



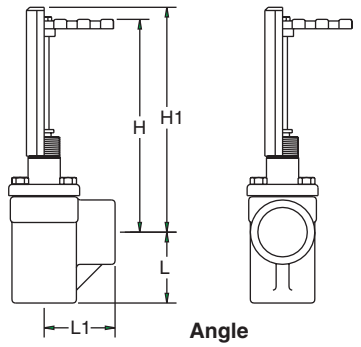
Angle



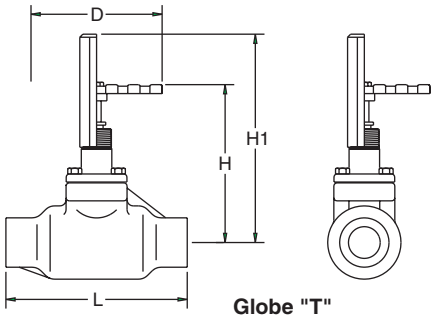
Globe "T"

Valve Size	Angle					Globe			
	L	L1	H	H1	D	L	H	H1	D
1/2"	1.75	1.75	7.25	8.75	2.50	3.75	7.25	8.75	2.50
3/4", 1"	1.50	2.00	8.50	9.50	4.00	3.88	8.50	9.50	4.00
1¼"	2.75	2.75	9.25	10.75	5.40	7.00	9.25	10.75	5.40
1½"	2.75	2.75	9.25	10.75	5.40	8.25	9.25	10.75	5.40

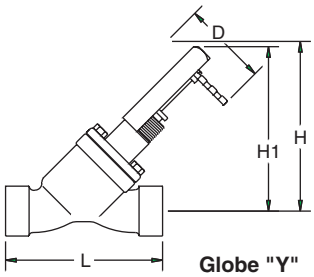
Socket Weld Connection, Standard Bonnet



Angle



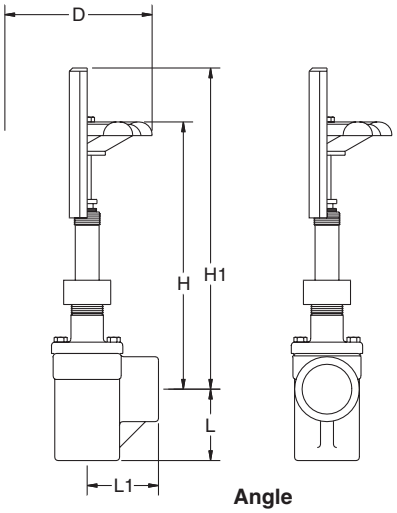
Globe "T"



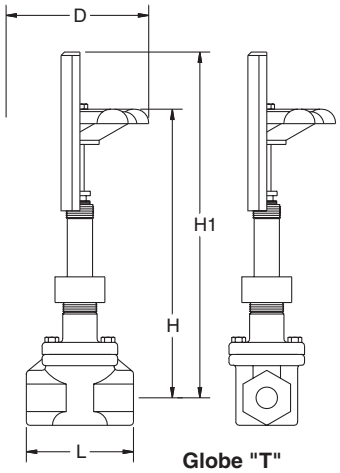
Globe "Y"

Valve Size	Angle					Globe "T"				Globe "Y"			
	L	L1	H	H1	D	L	H	H1	D	L	H	H1	D
1/4", 3/8", 1/2"	1.75	4.75	4.50	6.00	2.50	3.75	5.75	6.88	2.50	N/A			
¾", 1"	1.50	2.00	5.75	6.50	4.00	3.88	5.75	6.50	4.00	N/A			
1¼"	2.75	2.75	7.88	8.25	5.40	7.00	8.88	11.00	5.50	6.38	8.25	7.88	5.40
1½"	2.75	2.75	7.88	8.25	5.40	8.25	10.00	12.25	5.40	6.38	8.25	7.88	5.40
2"	3.12	3.12	8.38	8.63	5.40	8.25	10.00	12.25	5.40	8.00	9.50	8.63	5.40
2½"	3.75	3.75	9.00	9.25	5.40	9.75	13.75	14.25	5.40	9.25	10.50	9.50	5.40
3"	3.88	3.88	10.75	11.38	6.70	N/A				11.50	12.38	11.63	6.75
4"	4.50	4.50	11.63	12.00	6.75	N/A				13.88	13.75	12.63	6.75

Socket Weld Connection, Extended Bonnet



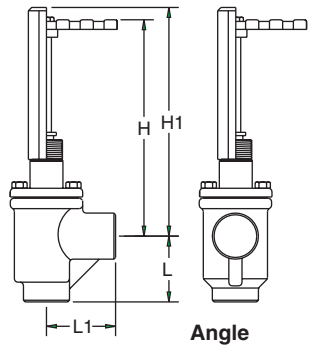
Angle



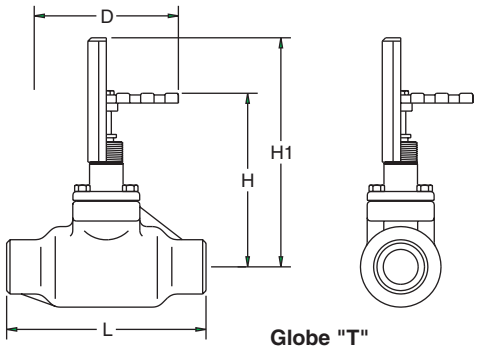
Globe "T"

Valve Size	Angle					Globe			
	L	L1	H	H1	D	L	H	H1	D
1/2"	1.75	1.75	7.25	8.75	2.50	3.75	7.25	8.75	2.50
3/4", 1"	1.50	2.00	8.50	9.50	4.00	3.88	8.50	9.50	4.00
1¼"	2.75	2.75	9.00	10.50	5.40	7.00	9.00	10.50	5.40
1½"	2.75	2.75	9.00	10.50	5.40	8.25	9.00	10.50	5.40
2"	3.12	3.12	10.25	11.25	5.40	8.25	10.25	11.25	5.40
2½"	3.75	3.75	10.50	11.50	5.40	9.75	10.50	11.50	5.40
3"	3.88	3.88	11.00	12.50	6.75	N/A			
4"	4.50	4.50	12.75	14.25	6.75	N/A			

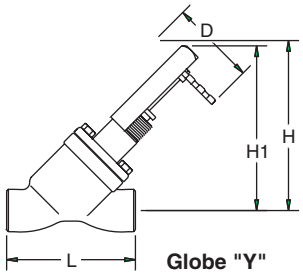
Butt Weld Connection, Standard Bonnet



Angle



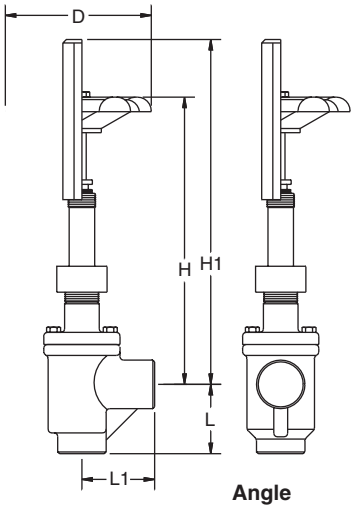
Globe "T"



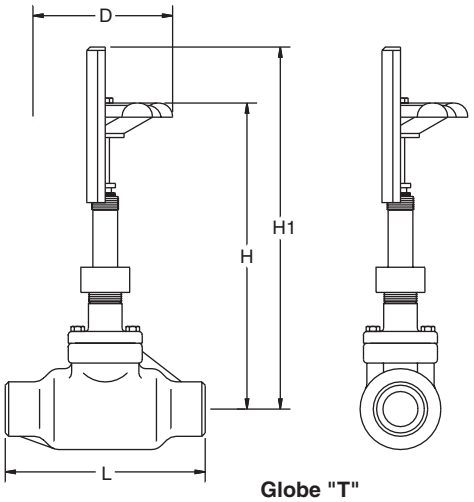
Globe "Y"

Valve Size	Angle					Globe "T"				Globe "Y"			
	L	L1	H	H1	D	L	H	H1	D	L	H	H1	D
1¼"	2.75	2.75	7.75	8.25	5.40	N/A				7.25	8.25	8.12	5.40
1½"	2.63	2.63	8.12	9.12	5.40	N/A				7.63	8.25	8.12	5.40
2"	3.00	3.00	8.50	8.75	5.40	N/A				8.12	9.75	8.75	5.40
2½"	3.63	3.88	11.12	11.75	6.75	N/A				9.63	10.75	9.50	5.40
3"	3.63	3.88	11.12	11.75	6.75	11.00	12.50	14.00	6.75	11.25	12.88	11.88	6.75
4"	4.62	5.00	11.38	12.00	6.75	12.50	14.00	15.50	6.75	12.25	13.25	12.25	6.75
5"	6.00	6.00	13.00	15.00	12.00	N/A				19.00	20.25	18.00	12.00
6"	6.38	6.38	14.50	15.50	12.00	N/A				22.00	21.68	18.68	12.00
8"	7.88	7.88	17.00	18.00	12.00	N/A				28.25	25.00	23.00	12.00
10"	9.75	9.75	25.75	27.25	16.50	N/A				35.00	35.00	32.00	16.50
12"	10.50	10.50	25.50	28.75	16.50	N/A				41.00	35.62	33.62	16.50

Butt Weld Connection, Extended Bonnet



Angle



Globe "T"

Valve Size	Angle					Globe			
	L	L1	H	H1	D	L	H	H1	D
1¼"	2.75	2.75	9.00	10.50	5.40	N/A			
1½"	2.63	2.63	9.00	10.50	5.40	N/A			
2"	3.00	3.00	10.00	11.00	5.40	N/A			
2½"	3.63	3.63	10.50	11.50	5.40	N/A			
3"	3.88	3.88	11.25	12.75	6.75	11.50	13.00	14.50	6.75
4"	4.50	4.50	12.75	14.25	6.75	13.00	15.25	16.75	6.75

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

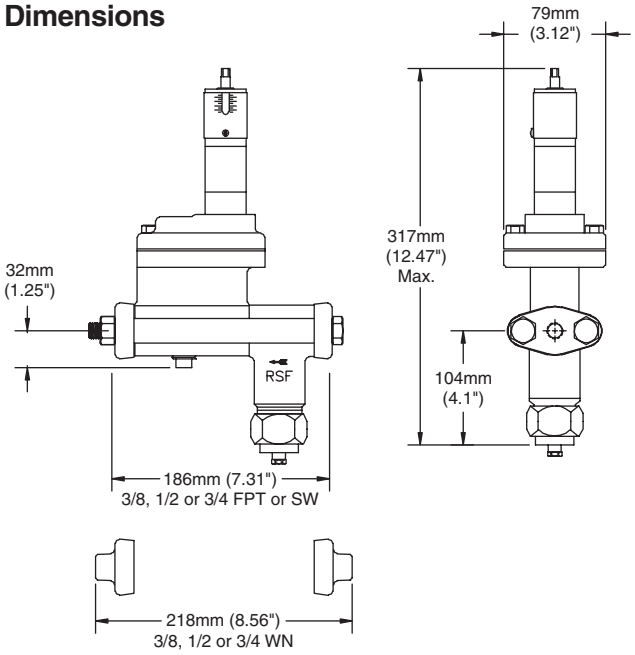
- External Adjustment
- Easy Setting Scale
- Eliminates System Balancing
- Integral Check Valve
- "Frost Free" Neck

Description

This precision built, heavy duty, self-contained, iron bodied Automatic Flow Regulator is used as a liquid control device for Ammonia Overfeed Systems. This adjustable flow regulator, once set, maintains a constant flow rate of liquid to the evaporator; it also serves as a check valve to prevent back flow into the liquid line from the evaporator during pressure reversals such as occur during hot gas defrost.

Refer to Bulletin 41-10.

Dimensions



Specifications

Maximum Rated Pressure (MRP) ..... 27.6 bar (400 psi)
Pressure drop range ..... 0.35 to 3.5 bar (5 to 50 psi)
Operating temperature ..... - 40° to 38°C (- 40° to 100°F)

Application Note

An AFR flow regulator is designed to maintain an approximately constant liquid refrigerant delivery rate into the evaporator. However, it is not an expansion device capable of controlling vapor or two-phase flow. Design conditions, which allow for the formation of flash gas as liquid flows through the regulator, can cause the AFR to chatter and result in irregular liquid delivery.

This feed device should be applied only where sufficient liquid subcooling exists to ensure that its outlet pressure will never be reduced to less than the liquid's saturation vapor pressure. AFR's are not recommended for application in gas displacement systems or where controlled pressure receivers deliver liquid to the evaporators.

How to Order

Type AFR automatic flow regulators can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Type	Inlet Flange	Outlet Flange	Strainer
AFR	F04	F04	S

Flange Type		Connection	
X	Less Flanges	00	None
F	FPT (IPS)	03	3/8"
S	SW (IPS)	04	1/2"
W	Weld Neck (IPS)	06	3/4"
D	DIN Weld Neck	10	10mm
		15	15mm
		20	20mm

Strainer	
N	No Strainer
S	w/Strainer

Weights

Less flanges ..... 3.6 kg (8 lb)
With flanges ..... 4.1 kg (9 lb)
With strainer & flanges ..... 5.0 kg (11 lb)

Parker Climate & Industrial Controls

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Refrigerating Specialties Division
Broadview, IL 60155 USA

- Eliminates System Balancing
- Overcomes Flow Fluctuations
- Permits evaporator optimization

Description

The Fixed Flow Regulator is used as a liquid flow control device for Liquid Recirculation Systems and is suitable for use with R-22 and Ammonia. The regulator establishes and maintains a constant flow rate determined only by the selected orifice number and independent of initial pressure drop or changes in the inlet or outlet pressure.

Materials

Body ..... ASTM 126 Class B cast iron

Piston ..... Stainless steel

Flow Orifice and Valve Body Cap ..... Steel

Specifications

Maximum Rated Pressure (MRP) ..... 27.6 bar (400 psi)

Pressure drop range ..... 0.35 to 3.5 bar (5 to 50 psi)
Higher pressure drops up to 300 psi will not harm the regulator but can cause poor flow control.

Operating temperature ..... - 40° to 38°C (- 40° to 100°F)

Refer to Bulletin 41-15.

Application Note

The FFR does not provide a check valve feature and will permit flow in the opposite direction; therefore, for hot gas defrost applications, or any other application where the pressure in the evaporator may occasionally exceed the pressure in the low pressure liquid line, a check valve must be installed *upstream.*

How to Order

Type FFR fixed flow regulators can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Type	Orifice Number	Inlet Flange	Outlet Flange	Strainer
FFR	10	K05	K05	S

Orifice Number*	
04	4
06	6
10	10
15	15
20	20
30	30
40	40
60	60
80	80

* Orifice number indicates nominal tons ammonia.

Flange Type		Connection	
X	Less Flanges	**00**	None
R	Less Flanges, w/Male Adapter Ring		
F	FPT (IPS)	**03**	3/8"
S	SW (IPS)	**04**	1/2"
W	Weld Neck (IPS)	**06**	3/4"
K	ODS (US)	**04**	1/2"
		05	5/8"
		07	7/8"
D	DIN Weld Neck	**10**	10mm
		15	15mm
		20	20mm

Strainer	
N	No Strainer
S	w/Strainer

⚠ WARNING!
ODS flanges not suitable for use with ammonia.

Weights

Less flanges ..... 1.4 kg (3 lb)
With flanges ..... 1.8 kg (4 lb)
With strainer & flanges ..... 2.7 kg (6 lb)

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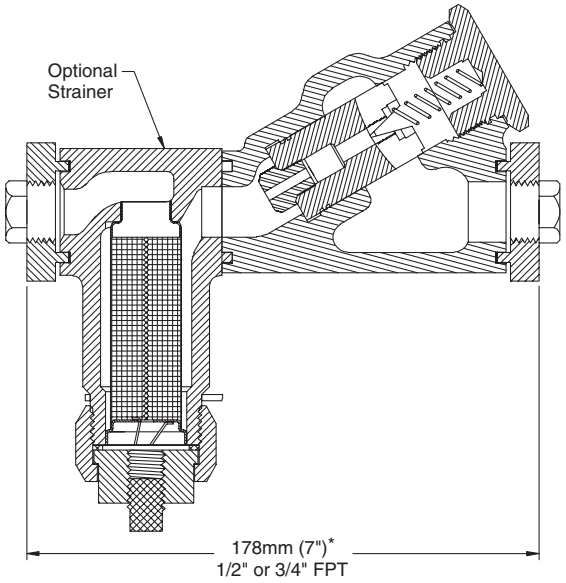
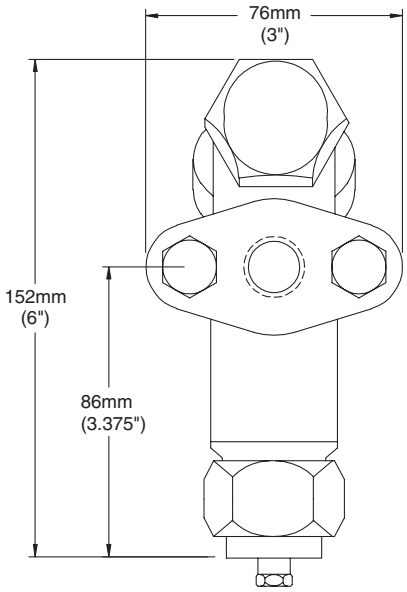
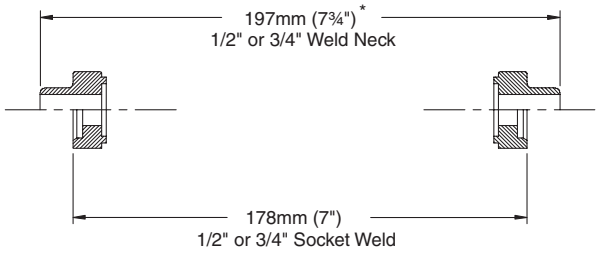
Dimensions





** For FFR-2 without strainer, deduct 51mm (2").*



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Broadview, IL 60155 USA

Notes

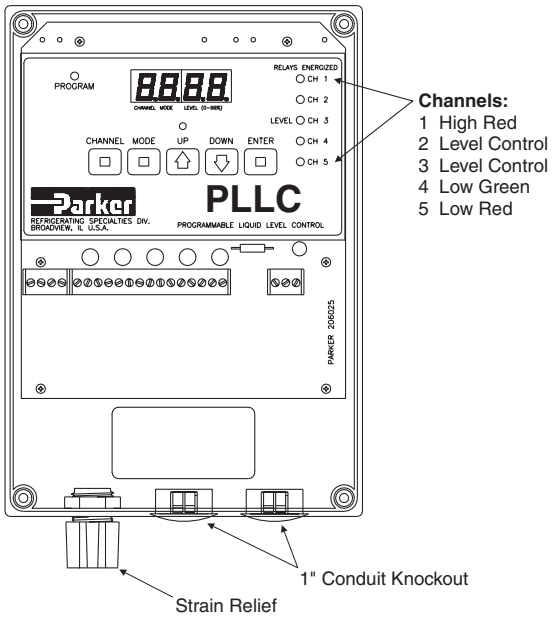
- Oversized keypad on front panel for programming
- Easy to read enlarged LED digital display
- 5 programmable 6 amp fused relays
- Level simulation mode facilitates control wiring check and test
- Large enclosure with separable terminal blocks accommodate up to 14 gage wire
- Plug-in style terminal blocks with recessed screws
- Conventional intstrument wiring from controller to probe
- 120/240 V 60 Hz or 110/220 V, 50 Hz Power
- 4-20 mA Output Signal

Purpose

The Programmable Liquid Level Control provides remote liquid level management for industrial refrigeration. The PLLC is designed for use specifically with Parker's *Depth Tracker* transducer liquid level probe. The PLLC provides the power source for the current loop of the probe. The transducer probe is used to provide a current signal proportional to the vertical liquid level in a standpipe or vessel. The PLLC serving as a switching mechanism also converts the return signal and performs up to 5 programmable relay functions.

Dimensions

Unit is 9½" high by 6¾" wide by 2" deep.

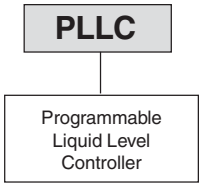


Wiring

The separable terminal blocks on the PLLC will accommodate up to 14 gage wire. The Line Voltage Input can be either 120/240V 60Hz or 110/220V 50Hz. The PLLC provides the power source for the current loop of the transducer probe. The programmable relays are individually 5 amp fused. Relays are equipped with normally open and closed terminals and can be wired as either. The maximum recommended distance between PLLC and probe is 5000 ft.

Refer to Bulletin 61-50.

How to Order



Weight

1.8 kg (4 lb)

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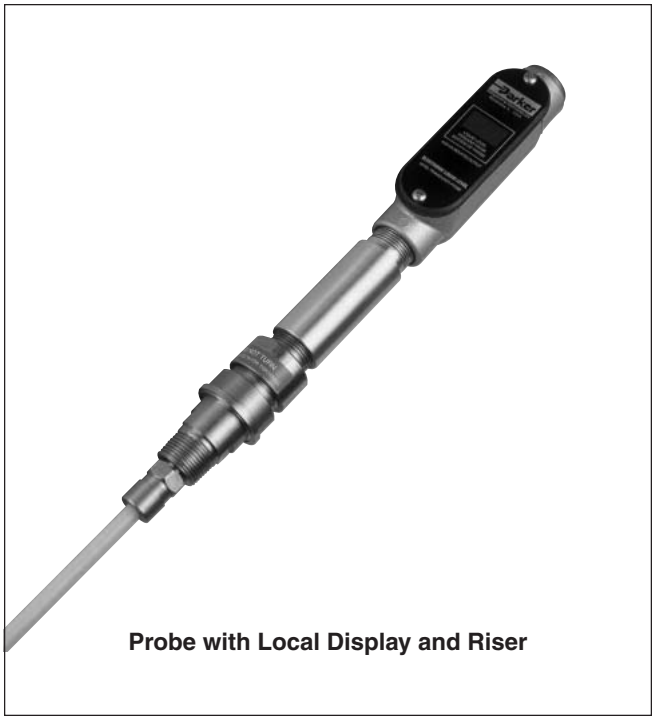
- Probe lengths: 2, 3, 4, 5, 6, 7, 8, 10 & 12 feet
- Integrated construction achieved by molding the PTFE sleeve directly to the center rod
- Electrical connection via 3/4" conduit boss or jacketed communications cable of suitable temperature/moisture protection
- Fully potted circuit board
- Local or remote digital read-out options
- Optional display riser accommodates column insulation
- Unique probelok connection option
- Factory pre-calibrated for ammonia for 0-100% level output in 4" IPS Standpipe. The electronics may be re-calibrated in the field to permit viewing of liquid level over any segment representing more than 40% of the probe's overall length.
- All wetted parts are stainless steel construction to prevent corrosion



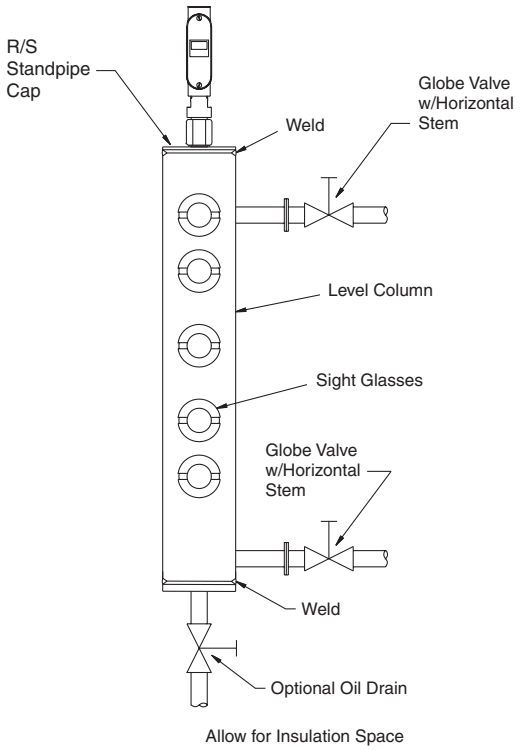
Probe with Local Display and Riser

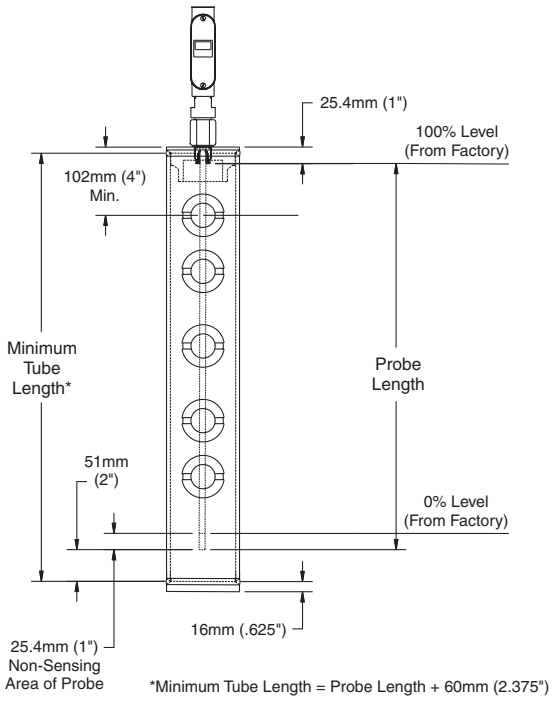
Description

The Depth Tracker Liquid Level Industrial Transducer Probe (ITP) is used to provide a current signal proportional to the vertical liquid level. A remote programmable controller (PLLC) or microprocessor functioning as a switching mechanism can convert the signal transmitted.

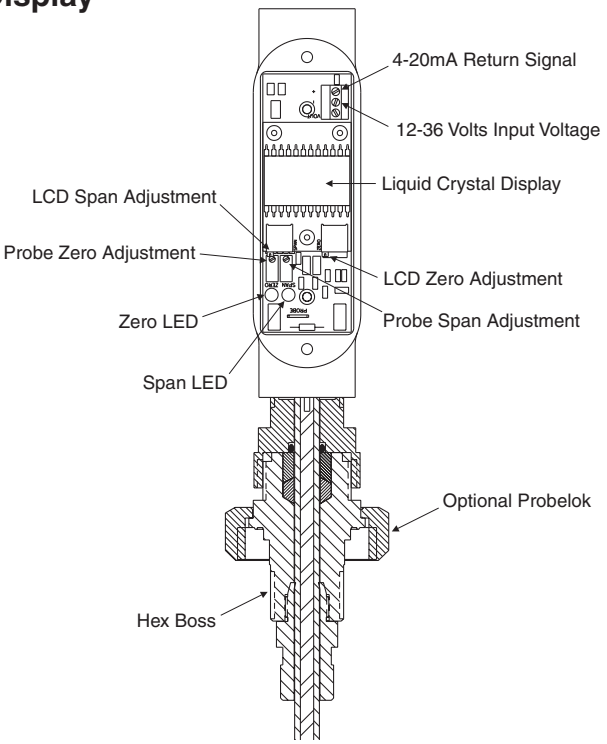
This device is for use with refrigerant R-717 (ammonia) only. It may be used with liquid temperatures in a range of -77° to 57°C (-107° to 135°F). The minimum ambient for circuit board enclosure is -29°C (-20°F).

Dimensions



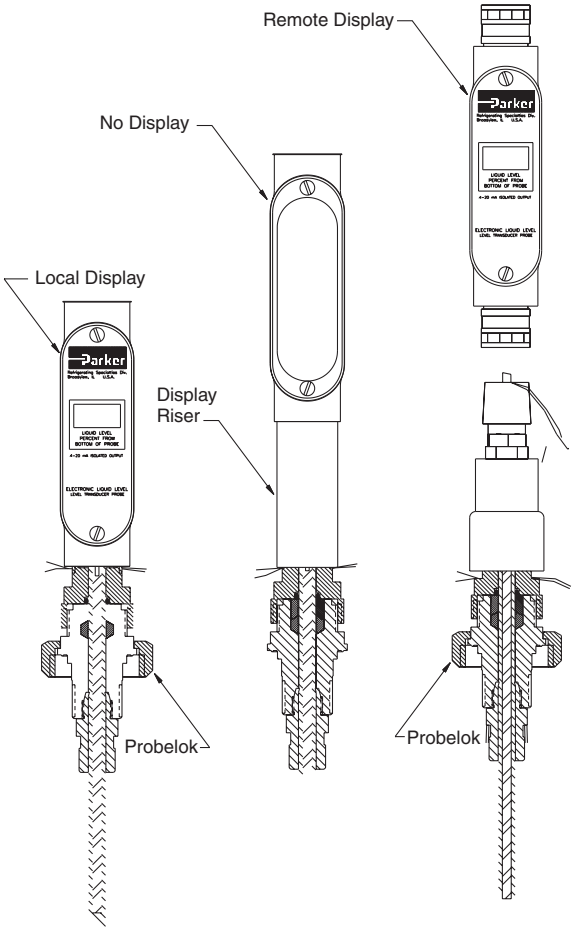


Display



Refer to Bulletin 61-30 for details on installation and settings.

Options



How to Order

Probes can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Length	Type	Display	Sleeve	Connection	Riser
05	ITP	D	C	N	X

Probe Length

02	2 feet
03	3 feet
04	4 feet
05	5 feet
06	6 feet
07	7 feet
08	8 feet
10	10 feet
12	12 feet

Display

N	No Display
D	Local Display
R	Remote Display

Sleeve

C	No Sleeve
S*	Sleeve

* Not available on 10-12 ft.

Connection

N	NPT (Standard)
P	Probelok

Riser

X	No Riser
R	Riser

Weights

Length	Less Display		With Local Display		With Remote Display	
	kg	lb	kg	lb	kg	lb
2 ft	2.7	6	1.9	4.2	2.1	4.7
3 ft	3.2	7	2.3	5.0	2.5	5.5
4 ft	4.1	9	3.1	6.8	3.3	7.3
5 ft	5.2	11.5	4.4	9.6	4.6	10.1
6 ft	5.7	12.5	4.7	10.5	4.9	11.0
7 ft	6.4	14	5.5	12	5.7	12.5
8 ft	6.8	15	5.9	13	6.1	13.5
10 ft	7.7	17	6.8	15	6.8	15.5
12 ft	8.6	19	7.7	17	7.9	17.5

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

- Hermetically Sealed, Fused Switch Assembly
- Transparent Switch Housing for Visual Observation
- Magnetically Actuated, Mechanically Operated
- Single Stage, Single Pole, Double Throw Switch
- Float Controlled
- Rugged Construction
- Switch Assembly Fully Rotatable to Suit Installation
- Large Available Differential Minimizes Short Cycling or Actuation of Switch by Liquid Surges
- Types LL, LLC, LLS, LLSC, LLA, LLAC are U.L. Listed and CSA Certified
- DIN connector standard

LL LLS

Description

Refrigerant float switches are suitable for use with Ammonia, R22, R134a, R404a, R507 and other common refrigerants. This float controlled, magnetically actuated, mechanically operated switch assembly can maintain close control of liquid level. The rugged construction makes it relatively insensitive to disturbances of the refrigeration system or vibration of the attached pipe lines.

The electrical switch, which is fused, and the operating mechanism are encapsulated within a transparent housing, which HERMETICALLY SEALS the moving parts and switch from ambient conditions and yet allows observation of the switching motion for determination of the liquid level.

Types LLC, LLSC, LLAC are U.L. listed for outdoor service.

Applications

To control liquid level in:

- liquid overfeed accumulators
- flooded surge drums
- flooded shell & tube chillers
- high and low pressure receivers
- intercoolers
- transfer vessels
- low or high level monitor

Materials

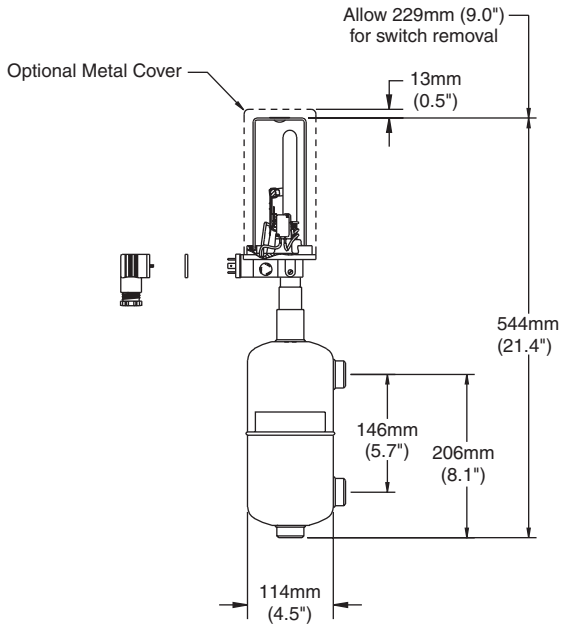
Standard Chamber ..... Steel
Float Ball ..... Stainless Steel

Specifications

Design Pressure (MRP) ..... 27.6 bar (400 PSI)
Fluid Temperature Range ..... -45° to 65°C (-50° to 150°F)
Ambient Temperature ..... -45° to 50°C (-50° to 120°F)
Switch ..... SPDT, Snap-acting, non-mercury
Rating..... 120/240VAC, 10 Amp, 240 VA Pilot Duty
Fluid Specific Gravity Range ..... 0.57 to 1.70
Differential ..... Adjustable 13-50 mm (½”-2”)
Factory set at 50mm (2”)
Chamber Connections ..... ¾” FPTor 1” Butt Weld
Replaceable Fuse Style Bag ..... 7 Amp, 240 VAC

Refer to Bulletin 61-10.

Dimensions



How to Order

Refrigerant Float Switches can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Type	Variations
LL	S

Type	
Blank	Standard model
C	With Metal Cover
S	With side, side and bottom connections
SC	With side, side and bottom connections and Metal Cover
A	Low Temperature★
AC	Low Temperature with Metal Cover★

★ Stainleess steel, temperature to -75°C (-100°F)

Standard model:

Hermetically sealed, clear plastic switch enclosure; tank connections combination fitting 3/4" FPT or 1" butt weld; mounted side and bottom; mild steel.

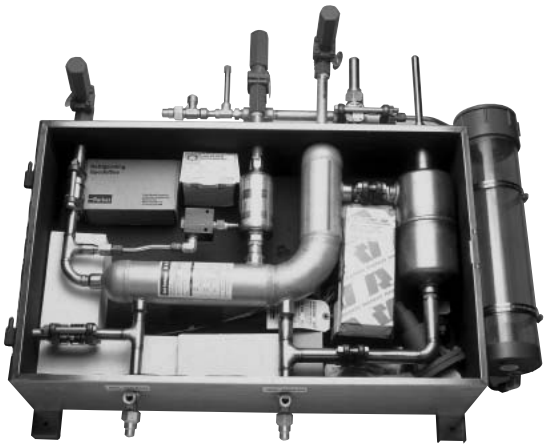
Weight

Type	kg	lbs
LL, LLS	5.9	13
LLA	5.9	13
LLAC	6.4	14
LLC, LLSC	6.4	14

Accessories

Item		Part Number
Permanent Magnet for external operation of switch assembly		201513
Replacement Top Switch Assembly	Conduit Boss	050100
	Quick Disconnect	050421
	Expl. Proof, Conduit	050101

- High Capacity
- 4 to 32 purge points
- Stainless steel insulated enclosure (32" L x 20" H x 8" D)
- 316 –L stainless steel shell and tube heat exchanger.
- All stainless steel interior flange and pipe connections.



(Shown with side of enclosure removed)

Refer to Bulletin 75-00.

Description

Rapid Purgers remove incondensibles from refrigeration systems. Included as standard on the purger:

Check valves
Gauge valves
Isolation valves
Liquid level switch
Vapor vent float
Water bubbler
Temperature controller
Liquid drainer
Pressure regulator

Controllers are available with 4 and 8 purge points (mini-micro) or 8, 16, 24 or 32 purge points (microprocessor) and can be easily adapted to any ammonia refrigeration plant. Five unique modes of operation allow maximum efficiency with minimal operator adjustments: automatic mode, automatic detection mode, scheduled purging mode, manual mode and remote mode.

How to Order

Rapid purgers can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Type	Pressure Range	Refrigerant	Voltage (Control Panel & Coils)	Control Enclosure	Purge Points
RP	H	7	1	S	08

Pressure Range

L	Low Range: System suction inches Hg to 14 PSI
H	High Range: System suction 15-30 PSI

Refrigerant

7	Ammonia

Voltage

0	Manual or Explosion Proof
1	120V 60Hz
2	240V 60Hz
3	240V 50Hz

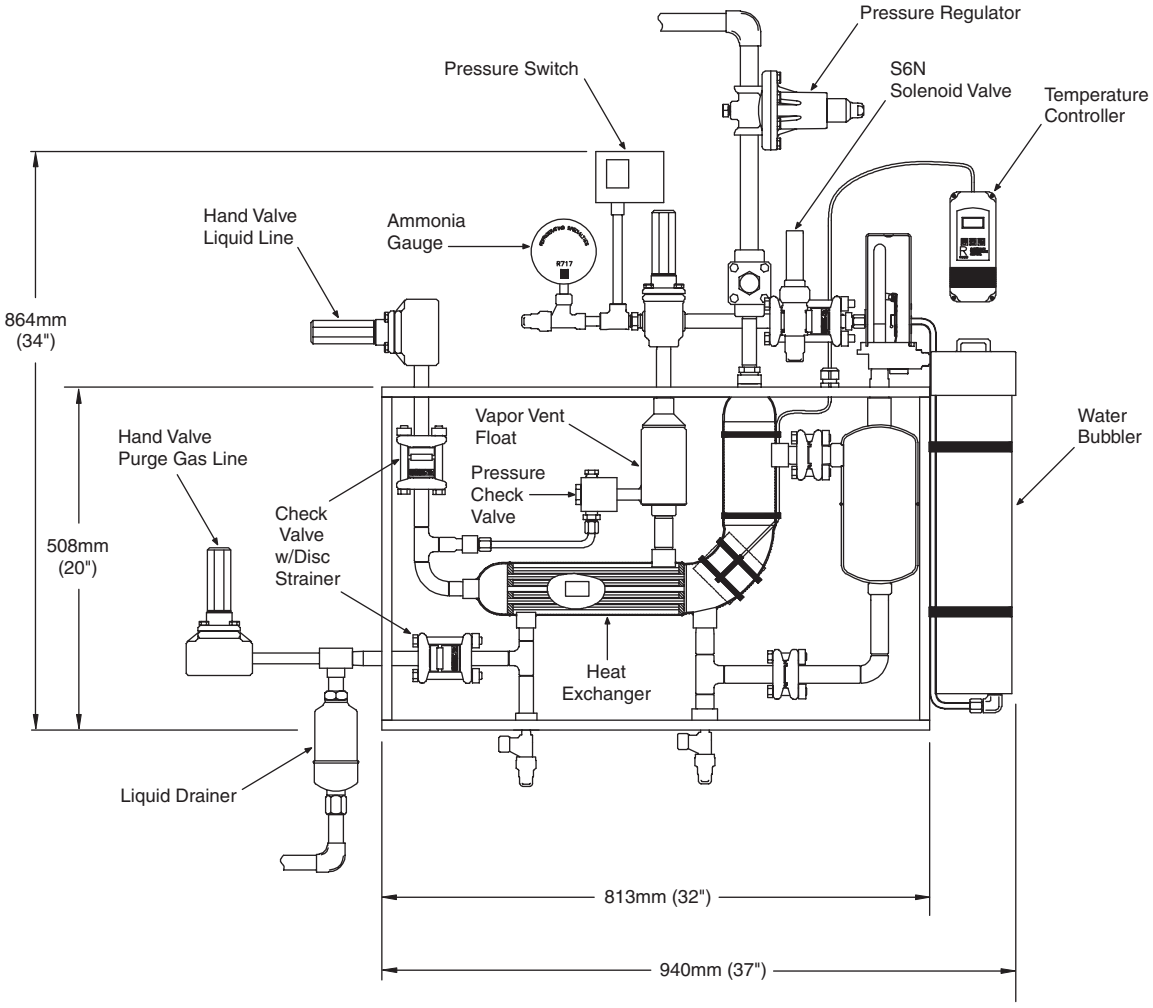
Control/Enclosure

E	Mini-Micro for 4 to 8 Purge Points (Requires Field Wiring)
S	Microprocessor Control for 8 or more Purge Points (Separate Mounting, Requires Field Wiring)
C	Remote Central Plant Control. Includes Insulated Stainless Enclosure and Local Electrical Controls

Purge Points

00	None – Corresponds to Manual or Central Plant Controlled
04	Four, Mini-Micro Control only
08	Eight, Either Mini-Micro or Microprocessor Control
16	Sixteen, Microprocessor Control only
24	Twenty-four, Microprocessor Control only
32	Thirty-two, Microprocessor Control only

Dimensions



Notes:

Purger styles that could encounter standby or power failure conditions such that vessel pressure could go high, should always be equipped with relief valves.

In the case of the Mini-Micro or the Microprocessor Controller, the control panel is always shipped separately and is mounted in close proximity of the Rapid Purger or at a remote location such as a refrigeration control room. Refer to Purger Bulletin 75-00 for additional information.

Refer to Rapid Purger Controller system information manual for specific operating and programming information. The Mini-Micro and Microprocessor are different manuals.

When ordering a purger with a microprocessor controller with option of condenser fan control and pump cycling, consult factory for additional information.

- Drains Liquid Only
- Stops Flow of Vapor
- Prevents Vapor Lockup
- Built-in Strainer
- No Small Orifices
- Resists Wire Drawing
- Includes Pilot Light
- Manual Opening Stem

Description

Used to drain liquid from defrosting evaporators or heat recovery condensors into a lower pressure portion of the system. Permits flow of liquid refrigerant only. Prevents flow of vapor refrigerant.

All are heavy duty devices intended for use with Ammonia, R-22, R-134a, R-404A, R-507 and other common refrigerants.

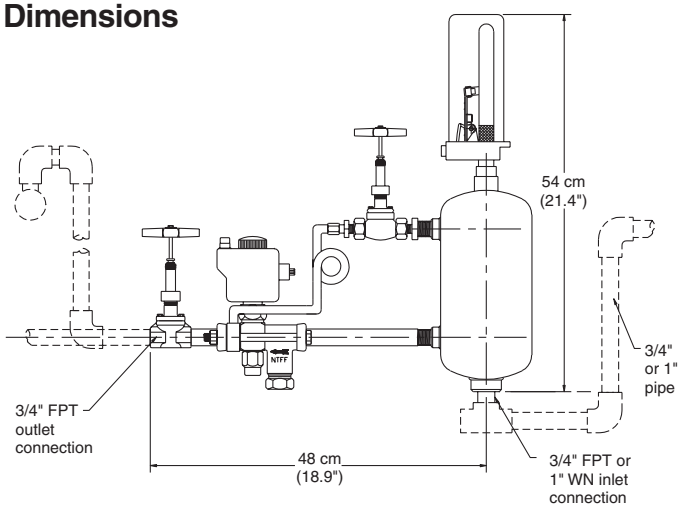
The Type ALD is a combination of a Type LLS Float Switch, a Type S8F Solenoid Valve with Strainer and Pilot Light Assembly, a 3/4" Hand Expansion Valve, and a 1/4" FPT Hand Expansion Bleed Valve as well as necessary pipe and fittings, complete for field assembly. Inlet is combination ¾" FPT or 1" butt weld. Outlet is ¾" FPT.

The rate of flow of refrigerant vapor (or liquid) through the vent valve is dependent upon the pressure difference between the float chamber and the Type ALD outlet pressure. It is also possible for the ALD to maintain a constant flow if the rate of liquid flow into the float chamber is equal to that leaving it.

The ALD can be manually drained by using the manual opening stem on the Type S8F solenoid valve.

Refer to Bulletin 62-01.

Dimensions



Ordering Information

Type	Coil Voltage	Coil Style	Pilot Light	Lens Color
ALD	R	1	2	G

Coil Voltage

R	120/6/60
S	208/6/60
T	240/6/60

Coil Style

1	Encapsulated w/36" Leads
3	Industrial Open Frame w/18" Leads

Lens Color

G	Green (std)
R	Red
A	Amber
W	White

Remote Pilot Light

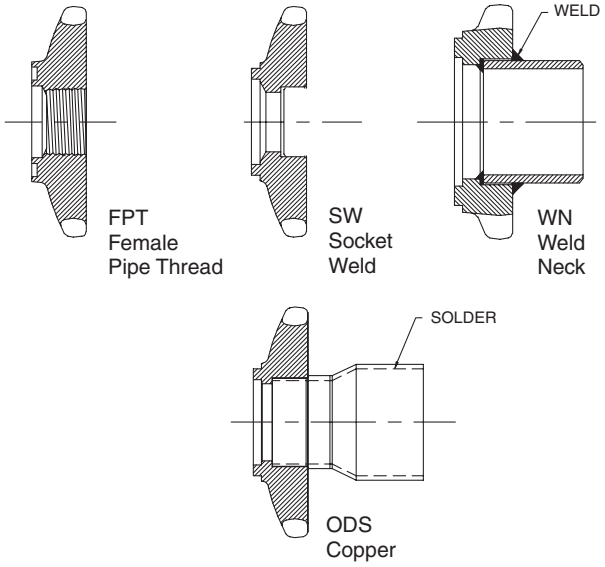
1	PLT-1 (NEMA 1)
2	PLT-2 (NEMA 4)

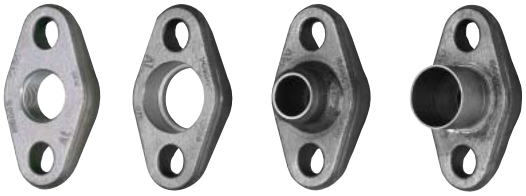
Flange Types

Flanges are sold individually and are available in male tongue type to fit sizes 5-150mm (½" to 6") and female groove type to fit sizes 5-100mm (½" to 4").

The following connection styles are available:

- Female Pipe Thread (FPT)
- Socket Weld (SW)
- Weld Neck (WN). Metric WN flanges also available in connection sizes ranging from 15 to 100mm. Consult factory for details.
- Outside Diameter Sweat (ODS) steel flanges with integral copper couplings to fit and solder over copper tubing. ***ODS flanges are not suitable for use with R-717 (ammonia).***
- ANSI flat face flanges are available from 125-200mm (5" - 8") for use with the CK4 check valve.
- Slip-On Socket I.D. ANSI Flat Face
- Weld Neck ANSI Flat Face

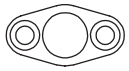




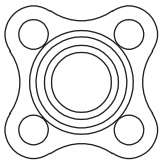
2-Bolt Flanges (FPT, SW, WN, ODS)

4-Bolt Flanges (SW, WN, ODS)
Also available in FPT

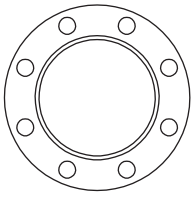
Flanges for sizes 5-25mm (3⁄16" to 1") are a 2-bolt oval style. Flanges for sizes 32-100mm (1¼" - 4") are a 4-bolt square style. Flanges for sizes 125-150mm (5" - 6") are an 8-bolt round style and are available as male type only.



5-25mm
(3/16" to 1")
Oval



32-100mm
(1¼" to 4")
Square



125-150mm
(5" to 6")
Round

Flange Union Kits

Flange union kits are available to join male and female flanges of the same size (see page 89).

Flange and Pipe Dimensions

US Pipe Sizes			Equivalent Metric Steel Tubing		Socket Weld Flange I.D.		Weld Neck Flange O.D.		ANSI Slip-On Socket I.D.		ANSI Weld Neck Neck O.D.	
Nominal	Actual O.D.											
Inch	mm	inch	NW	OD mm	mm	Inch	mm	inch	mm	inch	mm	inch
1/4"	13.72	0.540	8	13.5	14.22	0.560	13.72	0.540	—	—	—	—
3/8"	17.14	0.675	10	17.2	17.65	0.695	17.14	0.675	—	—	—	—
1/2"	21.34	0.840	15	21.3	21.84	0.860	21.34	0.840	—	—	—	—
3/4"	26.67	1.050	20	26.9	27.81	1.090	26.67	1.050	—	—	—	—
1"	33.40	1.315	25	33.7	34.67	1.365	33.40	1.315	—	—	—	—
1¼"	42.16	1.660	32	42.4	43.31	1.705	42.16	1.660	—	—	—	—
1½"	48.26	1.900	50	48.3	59.02	1.930	48.25	1.900	—	—	—	—
2"	60.32	2.375	50	60.3	62.10	2.445	60.3	2.375	—	—	—	—
2½"	73.02	2.875	65	76.1	74.80	2.945	73.03	2.875	—	—	—	—
3"	88.90	3.500	80	88.9	90.81	3.575	88.90	3.500	—	—	—	—
4"	114.30	4.500	100	114.3	116.20	4.575	114.30	4.500	—	—	—	—
5"	141.30	5.563	125	139.7	144.00	5.670	141.30	5.563	144.14	5.675	141.30	5.563
6"	168.28	6.625	150	165.1	170.90	6.730	168.28	6.625	171.07	6.735	168.28	6l625
8"	—	—	—	—	—	—	—	—	221.87	8.735	219.08	8.625

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

How to Order Flanges

Flanges can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Flange Size	Type	Connection Style	Connection Type	Connection Size
025	FL	M	F	08

Check table for available style/type/size combinations!

Flange Size	
013	Fits Port Sizes 5 & 13mm (3/16" & 1/2")
025	Fits Port Sizes 20 & 25mm (3/4" & 1")
032	Fits Port Size 32mm (1¼")
050	Fits Port Sizes 40 & 50mm (1⅝" & 2")
065	Fits Port Size 65mm (2½")
075	Fits Port Size 75mm (3")
100	Fits Port Size 100mm (4")
125*	Fits Port Size 125mm (5"
150*	Fits Port Size 150mm (6")
200	Fits Port Size 200mm (8")

Connection Style		Connection Type	
M	Male Tongue 	**F**	FPT (Female Pipe Thread)
		S	SW (Socket Weld)
F	Female Groove 	**W**	WN (Weld Neck)
		K	ODS (Outside Diameter Sweat)
		D	DIN Weld Neck
N	ANSI Flat Face	**Y**	SO (Slip On)
		Z	WN (Weld Neck)

Connection Size			
FPT, SW, WN, ANSI		**ODS**	
02	¼"	**04**	½"
03	⅜"	**05**	⅝"
04	½"	**07**	⅞"
06	¾"	**09**	1⅛"
08	1"	**11**	1⅜"
10	1¼"	**13**	1⅝"
12	1½"	**17**	2⅛"
16	2"	**21**	2⅝"
20	2½"	**25**	3⅛"
24	3"	**29**	3⅝"
32	4"	**33**	4⅛"
40	5"	**DIN Weld Neck** Select size in mm from table below.	
48	6"		
64	8"		

⚠ WARNING!
ODS flanges not suitable for use with ammonia.

Connection Size Availability

Flange Size	Connection Sizes Available					
	FPT (IPS)	Socket Weld (IPS) Weld Neck (IPS)	ODS (US)	DIN Weld Neck	ANSI Flat Face**	
					Weld Neck	Slip-on
013	02 03 04 06	02 03 04 06	04 05 07	10 15 20		
025	06 08 10	06 08 10	07 09 11	20 25 32		
032	10 12	10 12	11 13 17	32 40 50		
050	12 16	12 16	13 17 21	40 50		
065		20	21 25	65 75		
075		24	25 29	75		
100		32	33	A0		
125*		40			40	40
150*		48			48	48
200*					64	64

*Female flange not available ** For CK4 only

Weights

Flange Number Size	Used on R/S Port Sizes		Net Weight for Each Flange							
			FPT, SW		WN		ODS		ANSI	
	mm	inch	kg	lbs	kg	lbs	kg	lbs	kg	lbs
013	5 & 13	3/16" & 1/2"	0.14	0.3	0.23	0.5	0.14	0.3	—	—
025	20 & 25	3/4" & 1"	0.68	1.5	0.77	1.7	0.73	1.6	—	—
032	32	1-1/4"	0.68	1.5	0.91	2.0	0.73	1.6	—	—
050	40 & 50	1-5/8" & 1"	1.4	3.0	1.4	3.0	1.5	3.3	—	—
065	65	2-1/2"	2.3	5.0	3.0	6.5	2.5	5.5	—	—
075	75	3"	2.3	5.0	3.0	6.5	2.5	5.5	—	—
100	100	4"	4.1	9.0	6.8	15.0	4.5	9.9	—	—
125	125	5"	9.1	20.0	11.4	25.0	—	—	29.5	65
150	150	6"	9.1	20.0	11.4	25.0	—	—	38.6	85
200	200	8"	—	—	—	—	—	—	61.4	135

Flange Union Kits

Flange Union Kits are used to combine a male and a female flange within the same flange size code. Union Kits are available for flange sizes up to 100.

The kit consists of a flange gasket and the appropriate bolts for the flange size.

Order flanges separately.

Union Kits

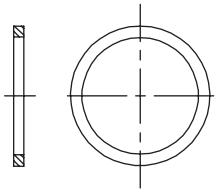
Flange Size	Union Kit Part Number
013	206213
025	206214
032	206215
050	206216
065	206217
075	206218
100	206219

Adapter Rings

Adapter rings are furnished with two matching flange gaskets.

Male Adapter Rings

Are used to close couple CK-4A or CK-1 Check Valves to the outlet of R/S Control Valves.



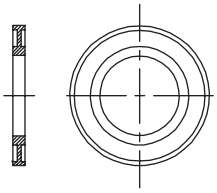
MALE ADAPTER RING

How to Order

Type	Part Number
MAR-13	200095
MAR-25	200089
MAR-32	200090
MAR-50	200091
MAR-65	200092
MAR-75	200093
MAR-100	200094

Female Adapter Rings

Are used in unions of two Male Flanges.

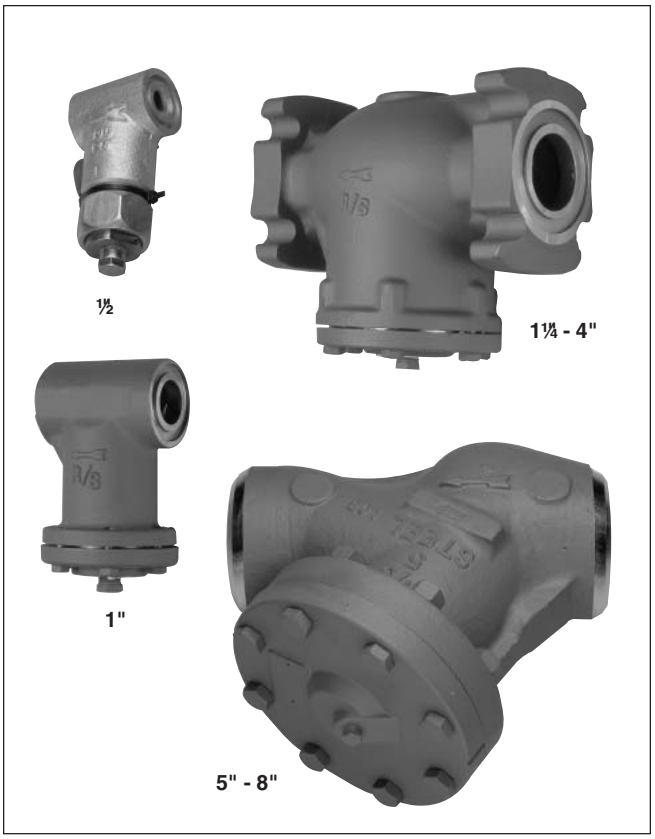


FEMALE ADAPTER RING

How to Order

Type	Part Number
FAR-13	200111
FAR-25	200112
FAR-32	200113
FAR-50	200114
FAR-65	200115
FAR-75	200116
FAR-100	200117

- Stainless Steel (60 Mesh) Screen
- 3/8" FPT Drain Connection 20-100mm (¾" to 8") for Safe Cleaning in Line; 1/4" FPT for 13mm (½")
- Ample Screen Area
- Low Pressure Drop
- Can Be Close Coupled to Inlet of any R/S Valve with Same Port Size
- Durable Filter Bags available 20-100mm (¾" thru 4") to Aid System Clean-Up
- Design Pressure (MRP): 27.6 Bar (400 PSIG)



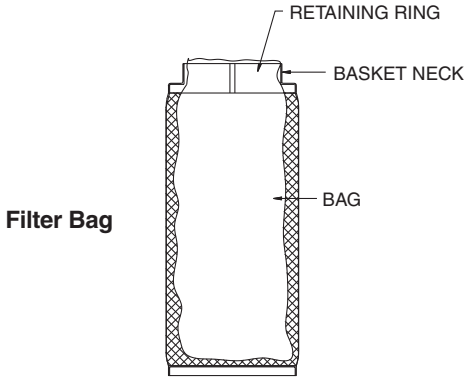
Description

Strainers are suitable for use with Ammonia, R-22, R-134a, R404A, R-507 and other common refrigerants

These industrial type Refrigerant Strainers with stainless steel screen are designed especially for the protection of R/S control valves from foreign materials present in refrigeration systems. The fine stainless screen mesh will collect particles as small as .006" in diameter. Generous available screen area allows maximum dirt capacity at minimum pressure drop.

The use of a strainer is extremely important upon start-up of a new refrigeration system where dirt, scale and weld particles may be present in the system and are disturbed and circulated when air testing or upon system start-up. Also when an existing system is revised, any settled dirt or foreign matter may be disturbed and circulated throughout the system. *It is not safe to omit strainers ahead of the control valves unless there is a certainty that the system will always be clean.*

If particles are too small to be removed by the strainer, it is suggested that a R/S filter bag be installed where applicable, periodically cleaned and removed when necessary.



Filter Bag

When used with R/S control valves, the strainer may be bolted directly to the inlet side of the valve to be protected. Standard R/S flange nuts and bolts are used to connect the strainer male outlet flange to the valve female inlet flange. Consequently, only one pair of R/S standard male companion flanges is needed for a close coupled strainer and valve combination.

Specifications

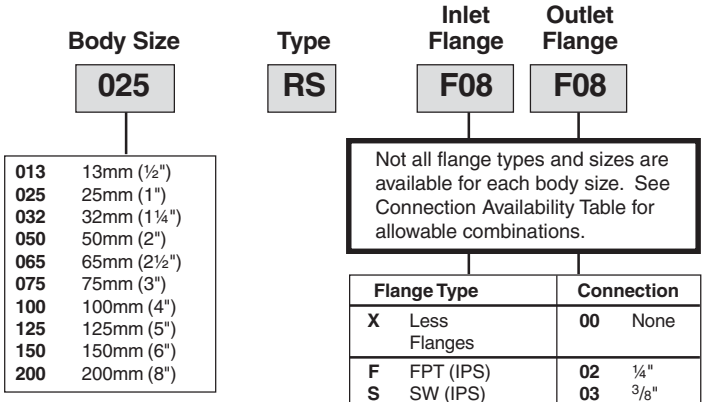
Size	Body Material	Screen Area		Screen Material
		Sq. cm	Sq. in.	
013	Gray Iron	39	6	Stainless Steel with Openings 0.23 x 0.23mm (0.009" x 0.009") 0.2mm (0.0075") Wire (60 Mesh)
025	Gray Iron	116	18	
032	Gray Iron	230	36	
050	Gray Iron	500	78	
065, 075	Gray Iron	570	88	
100	Gray Iron	794	123	
125	Cast Steel	790	123	
150	Cast Steel	1410	218	
200	Cast Steel	1750	272	

Flow Coefficients

13mm (½")	3.0 Kv	2.6 Cv
25mm (1")	9.4 Kv	8.1 Cv
32mm (1¼")	16.3 Kv	14.0 Cv
50mm (2")	67.7 Kv	58.2 Cv
65mm (2½")	112 Kv	96 Cv
75mm (3")	112 Kv	96 Cv
100mm (4")	170 Kv	146 Cv
125mm (5")	216 Kv	185 Cv
150mm (6")	362 Kv	311 Cv
200mm (8")	710 Kv	610 Cv

Refer to Bulletin 00-10.

How to Order



Flange Type		Connection	
X	Less Flanges	**00**	None
F	FPT (IPS)	**02**	¼"
S	SW (IPS)	**03**	3/8"
W	Weld Neck (IPS)	**04**	½"
		06	¾"
		08	1"
		10	1¼"
		12	1½"
		16	2"
		20	2½"
		24	3"
		32	4"
K	ODS (US)	**04**	½"
		05	5/8"
		07	7/8"
		09	1 1/8"
	Not suitable for use with ammonia.	**11**	1 3/8"
		13	1 5/8"
		17	2 1/8"
		21	2 5/8"
		25	3 1/8"
		29	3 5/8"
		33	4 1/8"
D	DIN Weld Neck	Size in mm. See table below.	

Note:

When flanges are specified in the model number, a **male** flange is provided for the inlet and a **female** flange for the outlet. If flanges are ordered separately (Code X - Less Flanges), a male and female should be ordered. See page 88.

Connection Availability

Size	Used with Port Size		Available Connection Codes (Bold Type Indicates Standard Size)			Weight			
						Less Flanges		With Flanges	
	mm	inch	ODS	FPT, SW, WN	DIN Weld Neck	kg	lbs	kg	lb
013	5 & 13	3/16 & ½	04, **05**, 07	02*, 03, **04**, 06	10, **15**, 20	0.9	2	1.4	3
025	20 & 25	¾ & 1	07, **09**, 11	06, **08**, 10	20, **25**, 32	3.2	7	4.5	10
032	32	1¼	11, **13**, 17	**10**, 12	**32**, 40, 50	6.8	15	8.2	18
050	40 & 50	1⅝, 2	13, **17**, 21	12, **16**	40, **50**	15	32	17	38
065	65	2½	**21**, 25	**20** (no FPT)	**65**, 75	24	53	29	63
075	75	3	**25**, 29	**24** (no FPT)	**75**	24	53	29	63
100	100	4	**33**	**32** (no FPT)	**A0**	52	114	60	132
125	125	5	N/A	N/A	N/A	45	100	—	—
150	150	6	N/A	N/A	N/A	79	175	—	—
200	200	8	N/A	N/A	N/A	136	300	—	—

* FPT only

Filter Bag Kits

Body Size	Kit Number
013	Not Available
025	201701
032	201702
050	201703
065, 075	202513
100	202514

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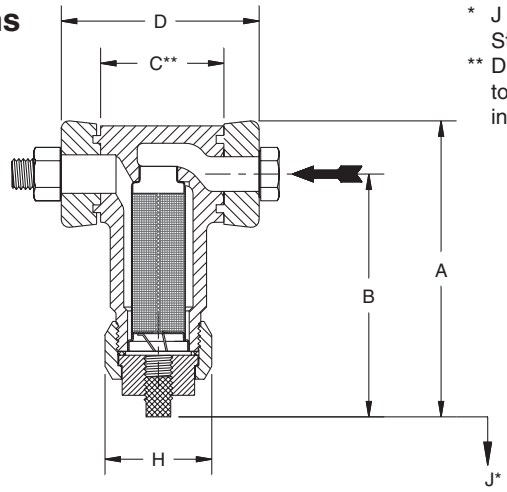
Broadview, IL 60155 USA

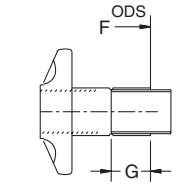
Dimensions

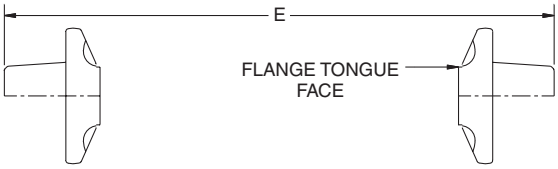
* J dimension is space required for removal of the Strainer Screen Assembly

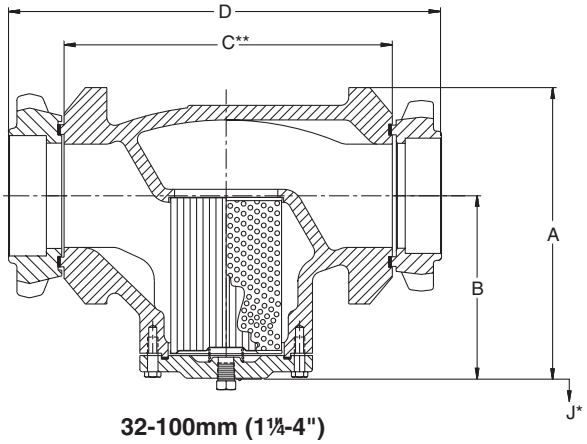
** Dimension C is the distance from one flange face to another. This is the space between the flanges in the line to allow the installation of the strainer.



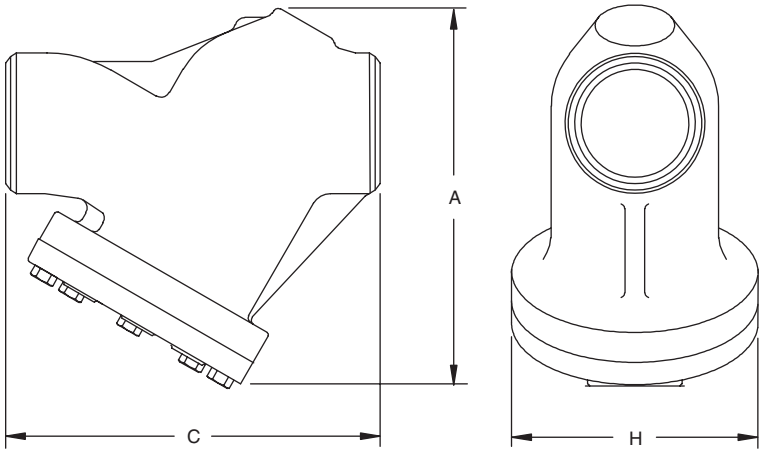
13-25mm (½-1")







32-100mm (1¼-4")



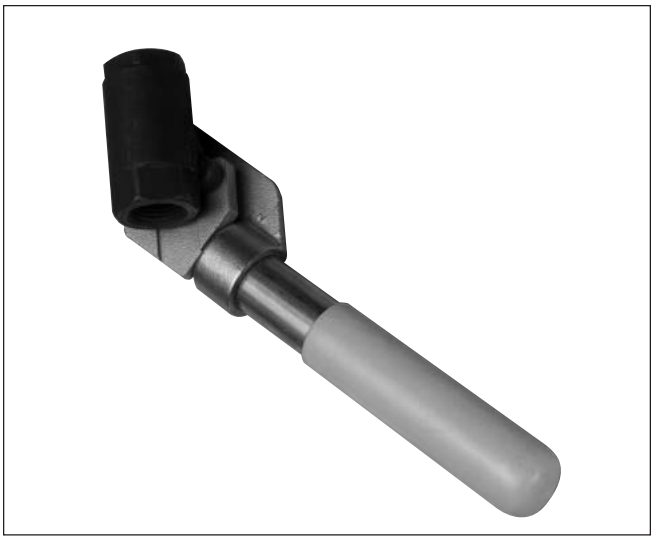
125-200mm (5"-8")

Strainer Size		Valve Port Size		A		B		C**		D (FPT,SW)		E (WN)		ODS SIZE	F (ODS)		G (ODS)		H		J	
mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	in	mm	in	mm	in	mm	in	mm	in
13	½	5 or 13	3/16 or 1/2	107	4.96	86	4.10	54	2.13	93	3.63	119	5.44	1/2 5/8 7/8	138 145 170	5.44 5.69 6.69	8.6 13 19	0.37 0.5 0.75	38	1.7	76	3.0
25	1	20 or 25	3/4 or 1	141	5.56	111	4.37	95	3.75	149	5.8	138	7.63	7/8 1-1/8 1-3/8 1-5/8	213 219 219 229	8.38 8.63 8.63 9.03	19 23 24 29	0.75 0.9 0.96 1.15	95	3.75	127	5.0
32	1¼	32	1¼	181	7.12	127	5.0	175	6.8	227	8.9	283	11.16	1-3/8 1-5/8 2-1/8	295 310 340	11.63 12.2 13.4	23 29 34	0.96 1.15 1.34	95	3.75	127	5.0
50	2	40 or 50	15/8 or 2	195	7.68	124	4.87	248	9.75	305	12	380	14.5	1-5/8 2-1/8 2-5/8	403 403 418	15.9 15.9 16.4	29 34 37	1.15 1.34 1.47	133	5.25	127	5.0
65	2½	65	2½	229	9.0	145	5.69	311	12.25	378	14.8	448	17.6	2-5/8 3-1/8	492 530	19.0 20.9	37 42	1.47 1.65	170	6.69	127	5.0
75	3	75	3	229	9.0	145	5.69	311	12.25	378	14.8	448	17.6	3-1/8 3-5/8	530 537	20.9 21.1	42 48	1.65 1.9	170	6.69	127	5.0
100	4	100	4	291	11.45	178	7.0	330	13	401	15.8	523	20.6	4-1/8	571	22.5	55	2.16	173	6.8	165	6.5
125	5	125	5	406	16			381	15										267	10.5		
150	6	150	6	483	19			483	19										318	12.5		
200	8	200	8	635	25			622	24.5										381	15		

Parker Climate & Industrial Controls

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

- Spring Return to Close
- RPTFE Stuffing Box Ring
- All Components of Lever are Stainless Steel
- Nitride Corrosion Protection
- Blow-out Proof Stem Design
- Adjustable Packing Gland
- Investment Cast Components
- Multifill Seats



Description

These carbon steel ball valves have a "deadman" spring return handle. Operating torque is approximately three times standard valve torque. Connections are threaded NPT.

Materials

Body A216-WCB
"Deadman" Handle ..... Stainless Steel
Ball ..... A108-CS Chrome Plated
Stem Packing and Seat ..... Multifill PTFE
Body Seal ..... PTFE
Retainer, Gland Nut and Stem A108-CS

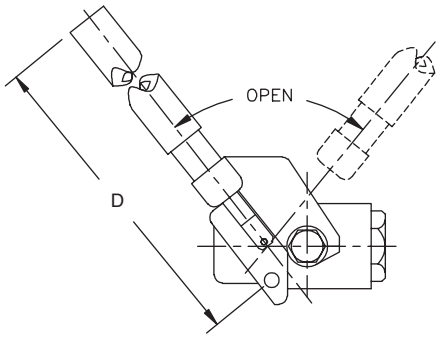
Specifications

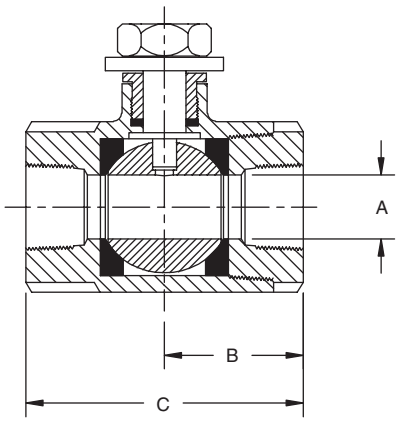
WOG ..... 138 bar (2000 psig)
Cold Non-Shock ..... 10.3 bar (150 psig) Saturated Steam, to 737mm (29 inches) Hg vacuum service
Federal Specifications ..... WW-V-35C, Type II

Ordering Information

Size	Part # Carbon Steel	Part # Stainless Steel	Weight
1/2"	206548	206551	0.6 kg (1.31 lb)
3/4"	206549	206552	0.9 kg (1.98 lb)
1"	206550	206553	1.1 kg (2.35 lb)

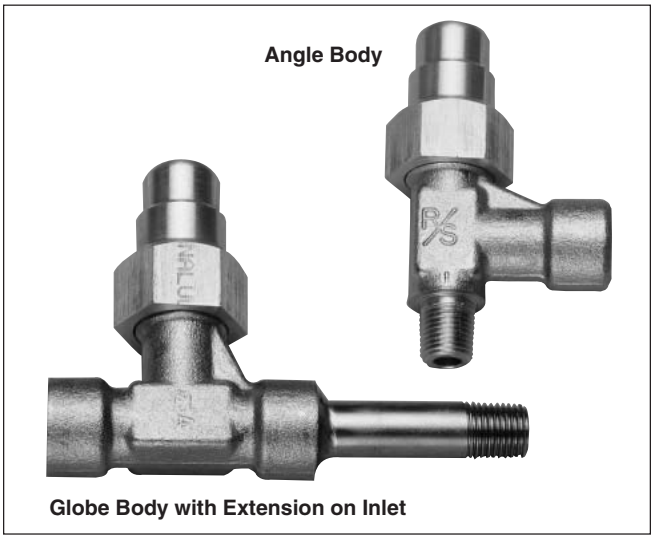
Dimensions





Size	A		B		C		D	
	mm	inch	mm	inch	mm	inch	mm	inch
1/2"	12.7	.50	28	1.12	57	2.25	178	7.00
3/4"	17	.68	38	1.50	76	3.00	178	7.00
1"	22	.87	43	1.68	86	3.37	178	7.00

- ASTM Forged Steel Body
- Stainless Steel Stem
- Angle or Globe Body
- Extended length available on inlet



Description

This line of rugged all steel bodied tiny hand valves are designed to seat tight and permit isolation of small system components. The stainless steel stem has the safety feature of being non-removable. The angle bodied valve and the globe body employ the same features. The optional MPT or FPT inlet connection and variable extended lengths are provided on both body sizes.

These multiple use small hand valves are normally mounted to pipe line components and lead to a gauge or instrument line. Flow rate are not generally of consideration except where valve is employed as a drain device or on remote piloted control valves

The valve is manually closed to prevent venting or to permit downstream component servicing. When manually opened, the inlet pressure source is equalized to the downstream side. This supports draining, venting, purging or component isolation.

Materials

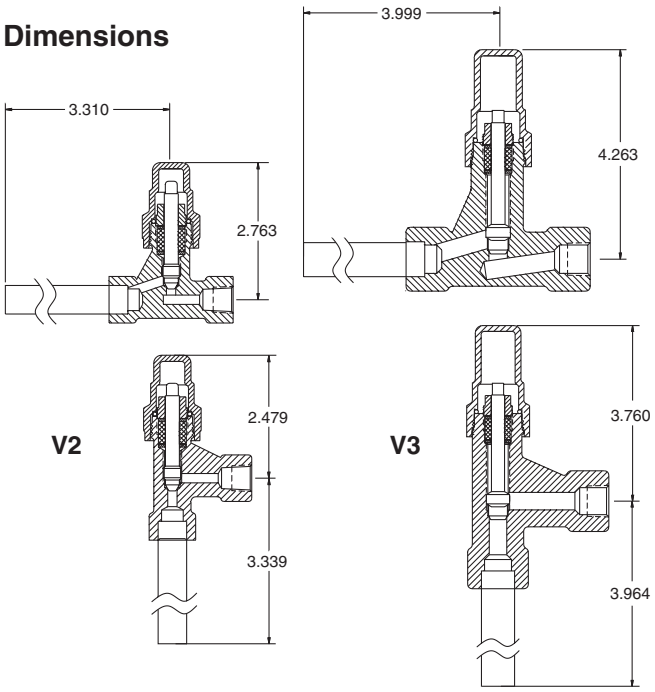
Body ..... Forged steel, zinc plated
Packing Nut ..... Steel
Stem ..... Stainless steel, 1/4" square flats
Stem Packing ..... Graphite base
Seal Cap ..... Aluminum
Seal Cap O-ring ..... Neoprene

Specifications

Maximum Rated Pressure (MRP) ..... 450 PSIG
Fluid Temperature Range ..... -40° to 115°C (-40° to 240°F)
Gauge Port ..... 1/4" FPT

Refer to Bulletin 84-00.

Dimensions



How to Order Unibody Gauge Valves

Gauge valves can be ordered separately by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Unibody Valve Size	Body Style	Inlet Connection	Extension on Inlet	Connection Style	Seal Cap
V2	A	M	00	N	A

Valve Size

V2	1/4" Body
V3	3/8" Body

Style

A	Angle
G	Globe

Inlet

M	MPT*
F	FPT

*Globe body with MPT inlet must have extension.

Extension on Inlet*

00	None or Female		
V2		**V3**	
10	2.50"	**13**	3.25"
13	3.25"	**16**	4.00"
15	3.75"	**20**	5.00"
21	5.25"	**24**	6.00"
26	6.50"	**28**	7.00"
30	7.50"	**32**	8.00"
34	8.50"		

* Available on MPT inlet only.

Connection

N	NPT
F	Ferulok*

* Available on V2 angle body only.

Seal Cap

A	Aluminum (V3 only)
P	Plastic

Parker Climate & Industrial Controls

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

- All gauges have adjustable pointer
- All gauges utilize stainless steel housing and polycarbonate window over face
- 2½ and 3½" gauges incorporate flutter prevention mechanism
- 2½" and 3½" gauges are ASME Grade B 3%/2%/3% Max. Error
- 6" gauges are ASME Grade A 1% Max. Error

Description

All refrigerant gauges are combination pressure/saturation temperature gauges with pressure range appropriate to high side or low side duty for the refrigerants listed.

The 2½" and 3½" gauges are bottom connected 1/4" MPT. The 6" gauges are panel mount, back connected, 1/4" MPT.

Materials

Socket and Bourdon:
Gauges for Halocarbon Duty ..... Bronze & Brass
Gauges for Ammonia Duty ..... Stainless Steel

How to Order Refrigerant Gauges

Gauges can be specified by using the symbols in the chart below to develop a model number. Select only those symbols that represent the features desired, and place them in the sequence indicated by the example at the top of the chart.

Refrigerant Gauge	Face Diameter	Refrigerant	Pressure Range	Unit System
RG	25	2	L	B

Face Diameter

25	2.5 inches
35	3.5 inches
60	6.0 inches

Refrigerant

7	Ammonia (R-717)
1	R-134a
2	R-22
4	R-404A or R-507

Pressure Range

L	Low Pressure Range
H	High Pressure Range

Unit System

M	Metric
B	Imperial

Refrigerant	Pressure Ranges			
	Imperial Units (Temp in °F)		Metric Units (Temp in °C)	
	High Side Pressure Range	Low Side Pressure Range	High Side Pressure Range	Low Side Pressure Range
R717 (Ammonia)	30" Vac - 300 PSIG	30" Vac - 150 PSIG	760mm - 25 Bar	760mm - 10.5 Bar
R134a	30" Vac - 300 PSIG	30" Vac - 300 PSIG	760mm - 21.5 Bar	760mm - 21.5 Bar
R22	30" Vac - 500 PSIG	30" Vac - 150 PSIG	760mm - 35 Bar	760mm - 10.5 Bar
R-404A or R-507	30" Vac - 500 PSIG	30" Vac - 150 PSIG	760mm - 35 Bar	760mm - 10.5 Bar

Parker Climate & Industrial Controls

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

GP Pump Advantages

- Proven over decades of use
- Designed exclusively for the delivery of primary or secondary refrigerants
- Driven by standard electric motor
- Ability to handle liquid/vapor mixture
- High pressure increase, low flow rate
- Strong construction
- Low maintenance

The Pump Design

- Open impellers
- Lateral channels
- Wide channels
- Twin axial face seals

Consult factory for ordering information.

New Products

Motors and valves shown are not included.

Advantages of HRP pumps

1. Unrivalled Safety

In contrast to most common hermetic pumps the stator housing of HRP pumps is designed to withstand high nominal pressure. If the motor "stator can" leaks in the event of an accident, no refrigerant will escape.

2. Good quality liquid delivery

The advanced design of the impeller-guide ring construction enables the pump to deliver a relatively high amount of vapor with the liquid flow. This is achieved without interrupting the constant delivery of the liquid. (The liquid volume flow will of course decrease with the increase of vapor volume.) In contrast to most other hermetic pumps the vapor that is generated while cooling the motor is vented to the discharge side without reducing the pump capacity.

3. Covering a wide range

All HRP pump models are suitable for the common refrigerants. The HRP 3232 is also especially designed to be used with CO_2 as a primary or secondary refrigerant. Due to the pump performance characteristic curve, each pump covers a wide range of applications.

4. Simple protection

The built-in temperature cut-out protects the pump against overheating and must be connected into the control system with the standard overload protection equipment. It is recommended to install a pressure differential switch or a flow switch on the discharge side of the pump.

5. No orifices or degassing lines required

The HRP pumps do not require any Q-max or Q-min orifices. The internal design of the pump incorporates an internal pressure equalization that enables the pump to depressurize quickly to the suction side during standstill, therefore eliminating the need for additional degassing lines.

6. Strong construction

The open execution of the impellers applies only small axial forces. The transformer oil protects the motor against moisture and provides good thermal conductivity.

7. Proven bearing design

With our extensive experience we have developed an improved low-wear bearing design. By monitoring the electrical resistance at the sensor contact, it is possible to detect for bearing wear while pump is at standstill.

8. Low maintenance

When the correct installation instructions are observed and carried out the pump will run for many trouble-free years without requiring maintenance. The strong conical filter in the pump suction inlet should be checked after commissioning. Note no other filters in the suction pipework are required. In the event of the pump filling with oil, it can be drained through screw plugs.

9. Suspended installation

Due to formation of ice around the pump, the suspended installation is preferred to foot mounting. This also allows for easy access to service the conical filter and to installing a condensate drip tray.

Consult factory for ordering information.

Same blue paint pigment to match Refrigerating Specialties Division's new factory enhanced, corrosion resistant paint.

- Meets Auto Industry Salt Spray Test Standards
- Water Based Low VOL
- EHS Compliant
- Quick Drying

Note: For overseas shipments, consult factory.

11 oz. Can ..... ***Order Part Number 309210***

Warranties

All Refrigerating Specialties products are warranted against defect in workmanship and materials for a period of one year from date of shipment from originating factory. This warranty is in force only when products are properly installed, field assembled, maintained and operated in use and service, as specifically stated in Refrigerating Specialties Catalogs or Bulletins for normal refrigeration applications, unless otherwise approved in writing by Refrigerating Specialties Division. Defective products, or parts thereof, returned to the factory with transportation charges prepaid, and found to be defective by factory inspection, will be replaced or repaired at Refrigerating Specialties option, free of charge, F.O.B. factory. Warranty does not cover products which have been altered, repaired in the field, damaged in transit or have suffered accidents, misuse or abuse. Products disabled by dirt or other foreign substances will not be considered defective.

THE EXPRESS WARRANTY SET FORTH ABOVE CONSTITUTES THE ONLY WARRANTY APPLICABLE TO REFRIGERATING SPECIALTIES PRODUCTS, AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, WRITTEN OR ORAL, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND IN NO EVENT IS REFRIGERATING SPECIALTIES RESPONSIBLE FOR ANY CONSEQUENTIAL DAMAGES OF ANY NATURE WHATSOEVER. No employee, agent, dealer or other person is authorized to give any warranties on behalf of Refrigerating Specialties, nor to assume, for Refrigerating Specialties, any other liability in connection with any of its products.

For More Information

Consult our web site **www.parker.com/refspec** for the most current bulletins and catalog information on all our products.

Safe Operation

People doing any work on a refrigeration system must be qualified and completely familiar with the system and the Refrigerating Specialties Division valves involved, or all other precautions will be meaningless. This includes reading and understanding pertinent Refrigerating Specialties Division product bulletins and Bulletin RSB prior to installation or servicing work.

Where cold refrigerant liquid lines are used, it is necessary that certain precautions by taken to avoid damage which could result from liquid expansion. Temperature increase in a piping section full of solid liquid will cause high pressure due to the expanding liquid which can possibly rupture a gasket, pipe or valve. All hand valves isolating such sections should be marked, warning against accidental closing, and must not be closed until the liquid is removed. (Tags are available for this purpose from the factory.) Check valves must never be installed upstream of solenoid valves or regulators with electric shut-off, nor should hand valves upstream of solenoid valves or downstream of check valves be closed until the liquid has been removed. It is advisable to properly install relief devices in any section where liquid expansion could take place.

Avoid all piping or control arrangements which might produce thermal or pressure shock.

For the protection of people and products, all refrigerant must be removed from the section to be worked on before a valve strainer or other device is opened or removed.

Flanges with ODS connections are not suitable for ammonia service.

Factory Repair and Rebuilding

For the convenience of our customers, we have a standard factory repair and rebuilding service. Repairable returned regulators are disassembled, cleaned, sandblasted, worn parts replaced, reassembled and repainted. For quickest service, it is advisable that this be done during the off peak season.

Temperature Pressure Data

Pressure in PSIG

Temp.		MP39 R-401A		HP80 R-402A		HP62 R-404A	FX10 R-408A	FX56 R409A		AZ20 R-410A	R-22	R-123	R-134a	R-502	AZ-50 R-507	R-717
°F	°C	Liquid	Vapor	Liquid	Vapor	Liquid	Liquid	Liquid	Vapor							
-50	-45.6	—	—	—	—	0.6	1.6	***12.4***	***17.2***	5.0	***6.2***	***29.2***	***18.4***	***0.2***	1.0	***14.4***
-45	-42.8	—	—	—	—	2.7	1.1	***9.7***	***15.2***	7.0	***2.7***	***29.0***	***16.6***	1.9	3.0	***11.8***
-40	-40.0	***8.1***	***13.2***	6.8	6.3	5.0	3.3	***6.8***	***13.1***	11.6	0.5	***28.9***	***14.7***	4.1	5.5	***8.8***
-35	-37.2	***5.1***	***10.7***	9.6	9.1	7.6	5.6	***3.5***	***10.7***	14.9	2.6	***28.7***	***12.3***	6.5	8.2	***5.5***
-30	-34.4	***1.7***	***7.9***	12.6	12.1	10.4	8.2	0.0	***8.1***	18.5	4.9	***28.4***	***9.7***	9.2	11.1	***1.7***
-25	-31.7	1.0	***4.8***	16.0	15.4	13.4	11.0	2.0	***5.1***	22.5	7.4	***28.1***	***6.8***	12.1	14.3	1.2
-20	-28.9	3.0	***1.4***	19.6	18.9	16.8	14.1	4.1	***1.9***	26.9	10.1	***27.8***	***3.6***	15.3	17.8	3.5
-15	-26.1	5.2	1.2	23.6	22.9	20.5	17.5	6.5	0.8	31.6	13.2	***27.4***	***0.1***	18.8	21.7	6.2
-10	-23.3	7.7	3.3	27.9	27.1	24.5	21.2	9.0	2.8	36.8	16.4	***27.0***	2.0	22.6	25.8	9.0
-5	-20.6	10.3	5.5	32.6	31.7	28.8	25.2	11.8	4.9	42.5	20.0	***26.5***	4.1	26.6	30.3	12.3
0	-17.8	13.2	8.0	37.6	36.7	33.5	29.5	14.8	7.2	48.6	24.0	***25.9***	6.5	31.1	35.2	15.6
5	-15.0	16.3	10.7	43.1	42.1	38.6	34.2	18.1	9.7	55.2	28.2	***25.3***	9.1	35.9	40.5	19.5
10	-12.2	19.7	13.7	49.0	48.0	44.0	39.3	21.7	12.5	62.3	32.7	***24.6***	11.9	41.0	46.1	23.7
15	-9.4	23.4	16.9	55.3	54.2	49.9	44.8	25.5	15.4	70.0	37.7	***23.7***	15.1	46.5	52.2	28.3
20	-6.7	27.4	20.4	62.1	60.9	56.2	50.7	29.6	18.7	78.3	43.0	***22.8***	18.4	52.5	58.8	33.4
25	-3.9	31.7	24.2	69.3	68.1	63.0	57.0	34.0	22.2	87.2	48.7	***21.8***	22.1	58.8	65.8	38.8
30	-1.1	36.4	28.3	77.1	75.8	70.3	63.7	38.7	26.0	96.8	54.9	***20.7***	26.1	65.6	73.3	44.9
35	1.7	41.3	32.8	85.4	84.0	78.1	71.0	43.8	30.1	107.0	61.4	***19.5***	30.4	72.8	81.3	51.4
40	4.4	46.6	37.6	94.2	92.8	86.4	78.7	49.2	34.5	118.0	68.5	***18.1***	35.1	80.5	89.8	58.4
45	7.2	52.4	42.7	104.0	102.0	95.4	87.0	54.9	39.2	130.0	76.0	***16.6***	40.0	88.7	98.9	66.1
50	10.0	58.5	48.2	114.0	112.0	104.7	95.8	61.0	44.3	142.0	84.0	***15.0***	45.4	97.4	109.0	74.3
55	12.8	65.0	54.1	124.0	123.0	114.7	105.1	67.6	49.8	156.0	92.5	***13.1***	51.2	107.0	119.0	83.2
60	15.6	71.9	60.4	136.0	134.0	125.3	115.1	74.5	55.6	170.0	101.6	***11.2***	57.4	116.4	130.0	92.6
65	18.3	79.3	67.2	147.0	146.0	136.6	125.6	81.8	61.9	185.0	111.0	***9.0***	64.0	127.0	141.0	102.8
70	21.1	87.1	74.4	160.0	158.0	148.6	136.8	89.5	68.6	201.0	121.4	***6.6***	71.1	138.0	154.0	113.8
75	23.9	95.4	82.1	173.0	171.0	161.2	148.7	97.7	75.8	217.0	132.0	***4.0***	78.6	149.0	167.0	125.5
80	26.7	104.0	90.2	187.0	185.0	174.6	161.2	106.4	83.4	235.0	144.0	***1.2***	86.7	161.0	180.0	138.0
85	29.4	114.0	98.9	202.0	200.0	188.8	174.4	115.5	91.5	254.0	156.0	0.9	95.1	174.0	195.0	151.4
90	32.2	123.0	108.0	218.0	215.0	203.7	188.4	125.2	100.2	274.0	168.4	2.5	104.2	187.4	210.0	165.5
95	35.0	134.0	118.0	233.0	232.0	219.4	203.1	135.3	109.4	295.0	182.0	4.2	113.8	201.0	226.0	180.6
100	37.8	145.0	128.0	251.0	249.0	235.9	218.7	146.0	119.2	317.0	196.0	6.1	124.1	216.2	244.0	196.7
105	40.6	156.0	139.0	269.0	267.0	253.4	235.0	157.2	129.6	341.0	211.0	8.1	134.9	232.0	252.0	213.9
110	43.3	169.0	151.0	288.0	286.0	271.7	252.1	169.0	140.6	365.0	226.4	10.3	146.3	247.9	281.0	231.8
115	46.1	181.0	163.0	308.0	305.0	290.9	270.2	181.4	152.3	391.0	243.0	12.6	158.4	265.0	301.0	251.0
120	48.9	195.0	176.0	238.0	326.0	311.1	289.1	194.4	164.7	418.0	260.0	15.1	171.1	282.7	322.0	271.1
125	51.7	209.0	189.0	350.0	347.0	332.3	308.9	208.0	177.8	446.0	278.4	17.7	184.5	301.0	344.0	292.5
130	54.4	224.0	203.0	372.0	370.0	354.5	329.7	222.3	191.6	476.0	296.8	20.6	198.7	320.8	368.0	314.9
135	57.2	239.0	218.0	396.0	393.0	377.8	351.5	237.2	206.3	507.0	317.0	23.6	213.6	341.0	393.0	338.8
140	60.0	255.0	234.0	420.0	418.0	402.2	374.3	252.9	221.8	539.0	337.3	26.8	229.3	362.6	419.0	363.5
145	62.8	272.0	250.0	446.0	443.0	427.7	398.1	269.3	238.2	573.0	359.0	30.2	245.7	385.0	446.0	390.2
150	65.6	299.0	267.0	472.0	470.0	454.4	423.0	293.0	286.4	608.0	381.0	33.8	263.0	408.4	475.0	417.4

Italics = inches Hg. Below 1 ATM

Parker Hannifin Corporation
Refrigerating Specialties Division
Broadview, IL 60155 USA

Temperature Pressure Data

Pressure in Bar

Temp.		MP39 R-401A		HP80 R-402A		HP62 R-404A	FX10 R-408A	FX56 R409A		AZ20 R-410A	R-22	R-123	R-134a	R-502	AZ-50 R-507	R-717
°F	°C	Liquid	Vapor	Liquid	Vapor	Liquid	Liquid	Liquid	Vapor							
-50	-45.6	—	—	—	—	0.0	0.1	***315.0***	***436.9***	0.3	***157.5***	***741.7***	***467.4***	***5.1***	0.1	***365.8***
-45	-42.8	—	—	—	—	0.2	0.1	***246.4***	***386.1***	0.5	***68.6***	***736.6***	***421.6***	0.1	0.2	***299.7***
-40	-40.0	***205.7***	***335.3***	0.5	0.4	0.3	0.2	***172.7***	***332.7***	0.8	0.0	***734.1***	***373.4***	0.3	0.4	***223.5***
-35	-37.2	***129.5***	***271.8***	0.7	0.6	0.5	0.4	***88.9***	***271.8***	1.0	0.2	***729.0***	***312.4***	0.4	0.6	***139.7***
-30	-34.4	***43.2***	***200.7***	0.9	0.8	0.7	0.6	0.0	***205.7***	1.3	0.3	***721.4***	***246.4***	0.6	0.8	***43.2***
-25	-31.7	0.1	***121.9***	1.1	1.1	0.9	0.8	0.1	***129.5***	1.6	0.5	***713.7***	***172.7***	0.8	1.0	0.1
-20	-28.9	0.2	***35.6***	1.4	1.3	1.2	1.0	0.3	***48.3***	1.9	0.7	***706.1***	***91.4***	1.1	1.2	0.2
-15	-26.1	0.4	0.1	1.6	1.6	1.4	1.2	0.4	0.1	2.2	0.9	***696.0***	***2.5***	1.3	1.5	0.4
-10	-23.3	0.5	0.2	1.9	1.9	1.7	1.5	0.6	0.2	2.5	1.1	***685.8***	0.1	1.6	1.8	0.6
-5	-20.6	0.7	0.4	2.2	2.2	2.0	1.7	0.8	0.3	2.9	1.4	***673.1***	0.3	1.8	2.1	0.8
0	-17.8	0.9	0.6	2.6	2.5	2.3	2.0	1.0	0.5	3.4	1.7	***657.9***	0.4	2.1	2.4	1.1
5	-15.0	1.1	0.7	3.0	2.9	2.7	2.4	1.2	0.7	3.8	1.9	***642.6***	0.6	2.5	2.8	1.3
10	-12.2	1.4	0.9	3.4	3.3	3.0	2.7	1.5	0.9	4.3	2.3	***624.8***	0.8	2.8	3.2	1.6
15	-9.4	1.6	1.2	3.8	3.7	3.4	3.1	1.8	1.1	4.8	2.6	***602.0***	1.0	3.2	3.6	2.0
20	-6.7	1.9	1.4	4.3	4.2	3.9	3.5	2.0	1.3	5.4	3.0	***579.1***	1.3	3.6	4.1	2.3
25	-3.9	2.2	1.7	4.8	4.7	4.3	3.9	2.3	1.5	6.0	3.4	***553.7***	1.5	4.1	4.5	2.7
30	-1.1	2.5	2.0	5.3	5.2	4.8	4.4	2.7	1.8	6.7	3.8	***525.8***	1.8	4.5	5.1	3.1
35	1.7	2.8	2.3	5.9	5.8	5.4	4.9	3.0	2.1	7.4	4.2	***495.3***	2.1	5.0	5.6	3.5
40	4.4	3.2	2.6	6.5	6.4	6.0	5.4	3.4	2.4	8.1	4.7	***459.7***	2.4	5.6	6.2	4.0
45	7.2	3.6	2.9	7.2	7.0	6.6	6.0	3.8	2.7	9.0	5.2	***421.6***	2.8	6.1	6.8	4.6
50	10.0	4.0	3.3	7.9	7.7	7.2	6.6	4.2	3.1	9.8	5.8	***381.0***	3.1	6.7	7.5	5.1
55	12.8	4.5	3.7	8.6	8.5	7.9	7.2	4.7	3.4	10.8	6.4	***332.7***	3.5	7.4	8.2	5.7
60	15.6	5.0	4.2	9.4	9.2	8.6	7.9	5.1	3.8	11.7	7.0	***284.5***	4.0	8.0	9.0	6.4
65	18.3	5.5	4.6	10.1	10.1	9.4	8.7	5.6	4.3	12.8	7.7	***228.6***	4.4	8.8	9.7	7.1
70	21.1	6.0	5.1	11.0	10.9	10.2	9.4	6.2	4.7	13.9	8.4	***167.6***	4.9	9.5	10.6	7.8
75	23.9	6.6	5.7	11.9	11.8	11.1	10.3	6.7	5.2	15.0	9.1	***101.6***	5.4	10.3	11.5	8.7
80	26.7	7.2	6.2	12.9	12.8	12.0	11.1	7.3	5.8	16.2	9.9	***30.5***	6.0	11.1	12.4	9.5
85	29.4	7.9	6.8	13.9	13.8	13.0	12.0	8.0	6.3	17.5	10.8	0.1	6.6	12.0	13.4	10.4
90	32.2	8.5	7.4	15.0	14.8	14.0	13.0	8.6	6.9	18.9	11.6	0.2	7.2	12.9	14.5	11.4
95	35.0	9.2	8.1	16.1	16.0	15.1	14.0	9.3	7.5	20.3	12.6	0.3	7.8	13.9	15.6	12.5
100	37.8	10.0	8.8	17.3	17.2	16.3	15.1	10.1	8.2	21.9	13.5	0.4	8.6	14.9	16.8	13.6
105	40.6	10.8	9.6	18.6	18.4	17.5	16.2	10.8	8.9	23.5	14.6	0.6	9.3	16.0	17.4	14.8
110	43.3	11.7	10.4	19.9	19.7	18.7	17.4	11.7	9.7	25.2	15.6	0.7	10.1	17.1	19.4	16.0
115	46.1	12.5	11.2	21.2	21.0	20.1	18.6	12.5	10.5	27.0	16.8	0.9	10.9	18.3	20.8	17.3
120	48.9	13.4	12.1	16.4	22.5	21.5	19.9	13.4	11.4	28.8	17.9	1.0	11.8	19.5	22.2	18.7
125	51.7	14.4	13.0	24.1	23.9	22.9	21.3	14.3	12.3	30.8	19.2	1.2	12.7	20.8	23.7	20.2
130	54.4	15.4	14.0	25.7	25.5	24.4	22.7	15.3	13.2	32.8	20.5	1.4	13.7	22.1	25.4	21.7
135	57.2	16.5	15.0	27.3	27.1	26.1	24.2	16.4	14.2	35.0	21.9	1.6	14.7	23.5	27.1	23.4
140	60.0	17.6	16.1	29.0	28.8	27.7	25.8	17.4	15.3	37.2	23.3	1.8	15.8	25.0	28.9	25.1
145	62.8	18.8	17.2	30.8	30.6	29.5	27.5	18.6	16.4	39.5	24.8	2.1	16.9	26.6	30.8	26.9
150	65.6	20.6	18.4	32.6	32.4	31.3	29.2	20.2	19.8	41.9	26.3	2.3	18.1	28.2	32.8	28.8

Italics = mm Hg. Below 1 ATM

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