ADAPTOMODE® OUTLET PRESSURE REGULATORS

Types: A4AO, A4AOE, A4AOS and A4AOSE

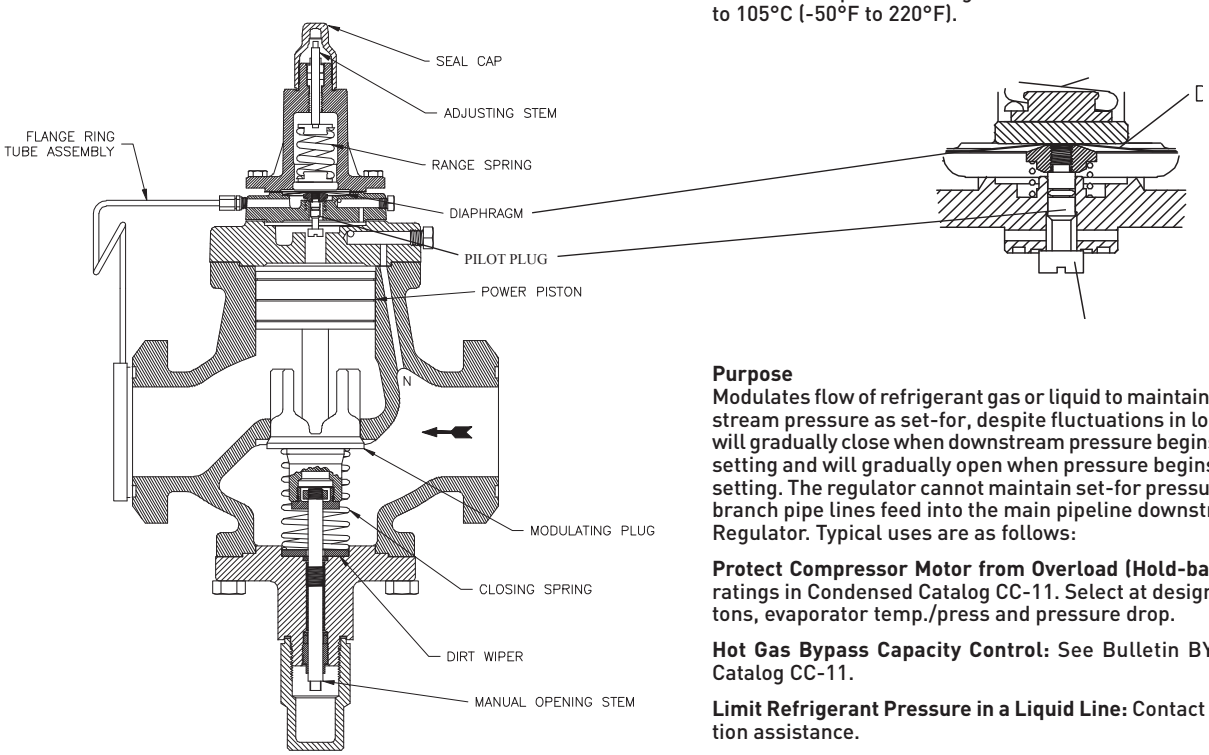
Port Size 20 - 100 mm (3/4" - 4")
FOR AMMONIA, R-12, R-22, R-502
OTHER REFRIGERANTS AND OIL

BULLETIN 23-07B
Type A4AO, A4AOE, A4AOS, A4AOSE

August 2006
Installation, Service and Parts Information

FEATURES

- Pilot operated characterized Modulating Plug precise control
- Suitable for all common refrigerants and oil
- 27.6 bar (400 psig) design pressure (MRP)
- Flanges for threaded or welded steel pipe and copper tube (copper not for ammonia)
- Interchangeable parts
- Easy to service
- Close coupled strainers, optional
- Many control variations are possible with the use of a few Modules and kits. (See Adaptomode Pressure Regulator Bul. 23-06)
- Stainless Steel Diaphragm
- Chrome Plated Pilot Seat
- Manual Opening Stem



Description
These compact, heavy duty, pilot operated, iron alloy (ASTM A126 Class B) Outlet Pressure regulators are suitable for Ammonia, R-12, R-22, R-502 and other common refrigerants and fluids approved for use in refrigerant valves. All 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.

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 current Bulletin 00-10 for strainer information.)

The fluid temperature range for the A4 Series of Regulators is -45°C to 105°C (-50°F to 220°F).

Purpose
Modulates 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. The regulator cannot maintain set-for pressure if uncontrolled branch pipe lines feed into the main pipeline downstream of the A4AO Regulator. Typical uses are as follows:

Protect Compressor Motor from Overload (Hold-back): See capacity ratings in Condensed Catalog CC-11. Select at design parameters i.e., tons, evaporator temp./press and pressure drop.

Hot Gas Bypass Capacity Control: See Bulletin BYG-4, Condensed Catalog CC-11.

Limit Refrigerant Pressure in a Liquid Line: Contact factory for selection assistance.

Prevent Deep Vacuum in Booster Suction: See capacity ratings Condensed Catalog CC-11 "Compressor Suction Loading". For selections other than those shown, contact factory.

Prevent Pressure Rise in Suction Main: Select valve based on mass flow requirements. Valve Cv and pressure drop across regulator. Contact factory for proper selection assistance, if required.

Hot Gas Defrost Control: Refer to Condensed Catalog CC-1 1 and Bulletin 90-10 for ratings and application information.

Principles of Operation (See Fig. 1 & 1A)

The outlet pressure is sensed under the diaphragm through the sensing tube, which is part of the Flange Ring-tube assembly. When the force created by the outlet pressure acting under the diaphragm is less than the force of the range spring, the pilot is open, allowing pressure to enter on top of the piston. This causes the power piston to force the modulating plug to open to maintain constant outlet pressure. Decrease in the outlet pressure allows the range spring to open the pilot further, allowing more pressure on top of the piston and opening the modulating plug further. An increase in the outlet pressure will lift the diaphragm against the force of the range spring, allowing the pilot plug to start closing. The pressure on top of the power piston is decreased and the closing spring acts to reduce the opening of the modulating plug and the flow of fluid through the regulator. The pressure on top of the power piston is controlled by the flow through the pilot seat and the bleed through a bleed hole in the power piston and through the clearance between the piston and cylinder. A minimum of 0.14 bar (2 PSIG) pressure drop across the regulator is required to open it fully.

The A4A0 Outlet Pressure Regulator therefore opens on a drop in the outlet pressure below its set point and closes on a rise in outlet pressure above its set point. The outlet pressure set point is not appreciably affected by variations in the inlet pressure.

Manual Opening Stem

All Type A4A Regulators are provided with a manual opening stem. To open the regulator manually, back the stem out (turn counterclockwise) until it stops. To put the regulator into automatic operation, turn the stem in (clockwise) until only the flats on the stem protrude from the packing nut.

Adjustment

Install a pressure gauge at the regulator gauge port in the A4A0 Adapter next to the sensing tube. Back the adjusting stem all the way out to stop (counterclockwise). This will reduce the set-point to its lowest level and cause the valve to close. Operate the system until the outlet pressure is lower-than desired. Slowly turn in the adjusting stem (clockwise) until the desired outlet pressure is reached.

A4A0 Outlet Pressure Setting Ranges

Set Point Ranges	Approx. Pressure Change per Turn of Adjusting Screw	Factory Set Point (unless otherwise specified)
V:500mm hg to 8.3 bar (20in hg to 120 psig)	1.7 bar (25 psi)	2.8 bar (40 psig)
D:5.2 to 19.3 bar (75 to 280 psig)	3.7 bar (53 psi)	9.7 bar (140 psig)

TYPE A4A0E (See Fig. 2)

Description
A4A0E Outlet Pressure Regulator,
Remote Sensing Connection

This regulator allows control of downstream pressure at a point remote from the outlet of the regulator. The pressure from the desired sensing point is connected directly to the A4A0E adapter at Fitting 7A in place of the Flange Ring-tube Assembly 20 shown for the A4A0. Thus the regulator will control the pressure at the sensing point. The regulator operation and adjustment is the same as for A4A0.

Type A4A0S (See Figs. 2, 3, and 4)

Description
A4A0S Outlet Pressure Regulator
With Electric Shut-Off

The A4A0S Pressure Regulator controls outlet pressure when the modular solenoid is energized, and closes when the solenoid pilot is de-energized regardless of the pressure setting or pressure in the regulator. The Modudapter (Fig. 2, item 28A) is used only with the A4A0S. The Pilot Solenoid is mounted on Pad #1 of the Modudapter along with Moduplate, item #52, mounted on Pad #2 with "S" showing to the outside of the regulator.

Adjustment: With the solenoid energized, proceed as with the A4A0.

Installation

All regulators are packed for maximum protection. Unpack carefully. Check the carton to make sure all flanges and other items are unpacked. Save the enclosed instructions for the installer and eventual user.

Do not remove the protective coverings from the inlet and outlet of the regulator until the regulator is ready to be installed. Protect the inside of the regulator from moisture, dirt and chips before and during installation. When welded or brazed flange connections are used, all slag, scale and loose particles should be removed from the flange interior before the regulator is installed between the flanges. It is advisable to install a close-coupled companion strainer (RSF) at the inlet of the regulator to help protect it from any foreign material in the system.

The A4A series of regulators will give optimum performance if mounted in a horizontal line in a vertical position with the manual opening stem on bottom. Where other positions are desired, the factory should be consulted, please give application and piping details. The regulator must be installed with the arrow on the valve body pointing in the direction of the fluid flow for the regulator to function properly. Backward flow through the regulator is uncontrolled and will vary with the valve model and the reverse pressure drop encountered. The regulator is not a check valve.

Tighten the flange bolts and nuts evenly to provide proper seating of the flange gasket and to avoid damage to gaskets or flanges. (See Flange Bolt Torque Table, page 12). Avoid using the regulator flange bolts to stretch or align pipe. Even the heavy duty semi-steel body of an A4A can be distorted, causing the precision parts to bind.

The regulator should be installed in a location where it is easily accessible for adjustment and maintenance. The location should be such that the regulator cannot be easily damaged by material handling equipment. When it is necessary to insulate the regulator (and companion strainer), the insulation should be installed to provide access to the regulator (and companion strainer) for adjustment and maintenance. Do not insulate the solenoid coil and coil housing. Proper indicating gauges should be installed to be easily visible to the operating engineer for system checking and adjusting purposes.

Disassembly and Assembly

Refer to Figs. 2, 3 and 4 in this section.

Before disassembling any A4A type regulator, read the information in this bulletin and Bulletin RSB, Safety Procedures for Refrigerating Specialties Division Refrigeration Control Valves.

Before a regulator is removed from the line or disassembled in the line, make sure that all refrigerant has been removed from the regulator, including the bonnet where applicable, and the close coupled strainer. The regulator must be isolated from the rest of the system in a safe manner. When pumping down to remove the refrigerant, the manual opening stem 33A must be turned out (counterclockwise) to make sure the valve is open.

All A4A Regulators General Procedure

The construction of the regulator and the method of disassembly are relatively simple, but some procedures must be followed to avoid damage. The following describes the procedure for the basic A4A; special instructions for other types are included in other appropriate sections.

Disassembly and Assembly (continued)

Disassembly - Take care when removing Seal Caps 1 and 44 in case some refrigerant may be trapped inside. Back the Adjusting Stem 6 all the way out to remove any pressure from Range Spring 13 otherwise damage to Diaphragm 17 or Pilot Seat 18 may occur. Remove Bonnet 8 by carefully removing Cap Screws 11. Take care not to damage Diaphragm Follower 15. Remove Adapter 28 by removing Cap Screws 31. Turn the Manual Opening Stem 33A all the way in until the flats on the stem barely protrude from the stuffing box nut. Push Piston 30 down against the spring force. The piston should move freely down and be returned by the spring force. If the piston is jammed or sticky, remove Bottom Cap Assembly which includes Items 33 through 42 by removing Cap Screws 39 or unscrewing Bottom Cap, 20mm through 32mm (3/4" through 1-1/4"). Using a hard wood dowel rod inserted through the bottom of the valve, tap the piston upward and out. Thoroughly clean all parts. If jamming has taken place and the piston and bore are scored, remove all burrs by polishing the piston, bore and modulating plug with fine crocus cloth. Inspect the seating area of the Modulating Plug 33 for damage or erosion. If damaged it should be replaced. It would be advisable to replace the entire bottom cap assembly. Inspect all gaskets and "O" rings for damage and replace where necessary.

Assembly - When reassembling the valve, all internal parts should be clean, dry and lightly oiled with refrigerant oil, except "O" rings. Apply silicone grease to the "O" rings. Care must be taken especially when the parts are cold since moisture can condense on parts and cause rapid rusting. When replacing gaskets, they should be oiled very lightly with refrigerant oil before assembly. Install bottom cap assembly first and tighten in place. Carefully replace the piston; never try to force it in place. Align the Adapter Gasket 29 carefully with the proper holes in the adapter and valve body and fasten adapter in place. Before assembling the bonnet be sure the Adjusting Stem 6 is turned all the way out and that the Bonnet 8 and Diaphragm Follower 15 are properly aligned, otherwise damage to the diaphragm and pilot seat may occur. Place Gasket 19 in the adapter and align Gasket 16 and Diaphragm 17 to the center of the bonnet. The raised center of the diaphragm must be towards the bonnet. For range "D" use two diaphragms. Tighten Cap Screws 11 evenly. The ideal tightening torque is 1.5 Kg-m (11 ft. lbs.). Valve is now ready to be adjusted for normal operation.

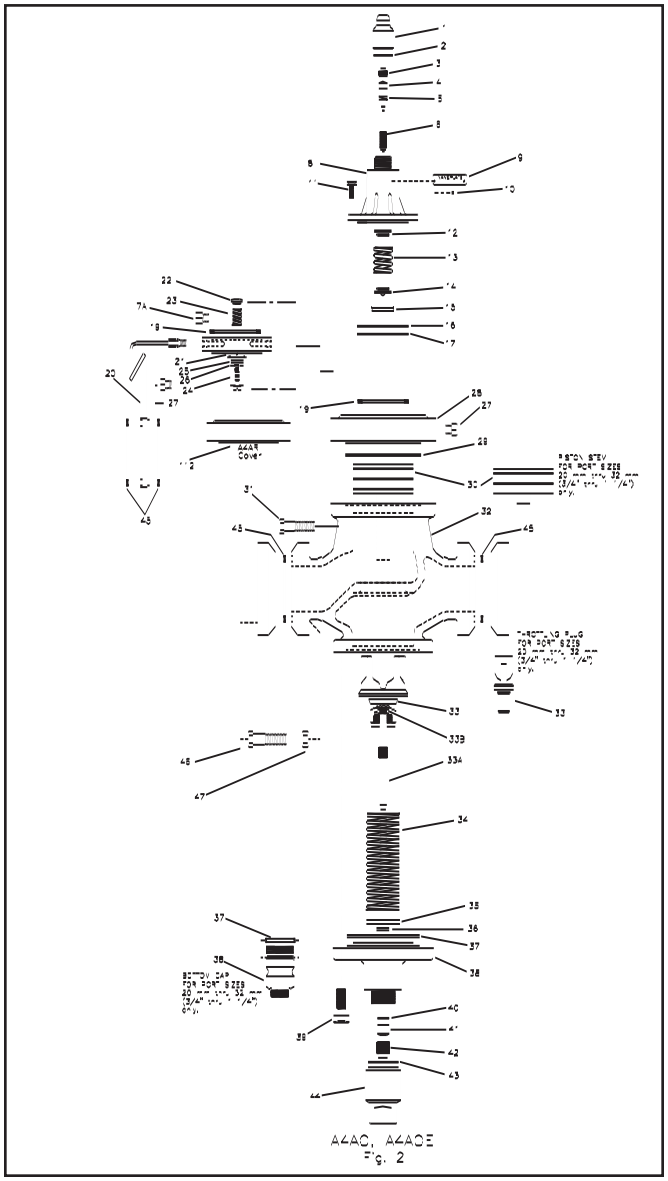
If close coupled strainer is used, it may be cleaned before putting the valve back in operation. The regulator must be tested for leaks with refrigerant gas or other appropriate gas before the system is put into operation.

Basic Modules (Used on A4A0S/A4A0SE)

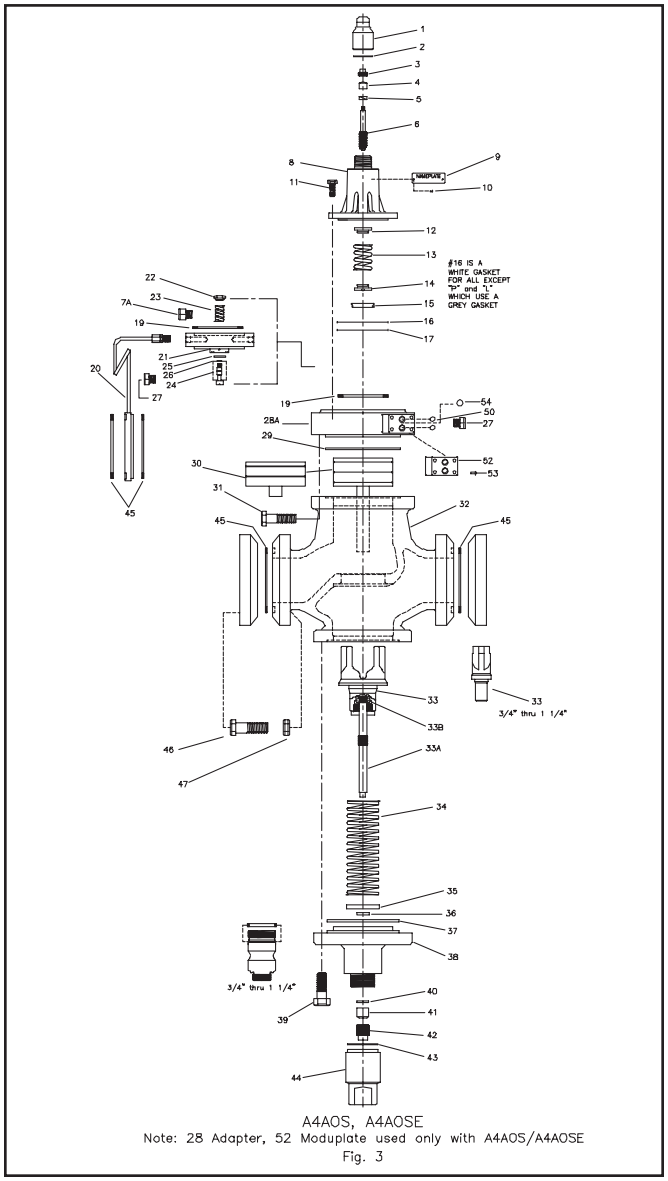
Disassembly and Assembly

Refer to exploded views (Figs. 3 and 4), illustrating the Modular Solenoid Pilot and Moduplate. These modules are used only with the A4A0S/ A4A0SE Outlet Pressure Regulator with Electric Shut Off. The Modudapter, Item #28 (Fig. 2) accommodates these modules. The Pilot Solenoid is mounted on Pad #1 of the Modudapter along with the Moduplate, item #52, mounted on Pad #2 with the "S" showing to the outside of the regulator.

Before disassembling and assembling any modules, refer to page 2 of this bulletin and to Bulletin RSB, Safety Procedure for Refrigerating Specialties Division Refrigeration Control Valves.



A4AC, A4ACE
Fig. 2



A4A0S, A4A0SE
Note: 28 Adapter, 52 Moduplate used only with A4A0S/A4A0SE
Fig. 3

Disassembly and Assembly (continued)

Modudapter (See Figs. 1, 2 and 3)

The Modudapter 28 will accommodate the Modular Pilot Solenoid and Moduplate. When assembling make sure the Modudapter gauge port is directly lined up with the inlet of the regulator. Passage N must communicate upstream pressure through the hole in the Adapter Gasket 29 as well as into Modudapter 28 and thence to the pilot modules. It is imperative that proper alignment of these items be made to assure regulator function.

Before disassembly, make sure all refrigerant has been removed from the regulator and strainer, if used.

Protect the surfaces of Pads 1 and 2 of the Modudapter at all times since these surfaces determine the sealing tightness of the "O" Rings.

S6A Modular Solenoid Pilot (Fig. 4)

This solenoid pilot is mounted on Pad 1. Before working on any solenoid pilot, make sure the coil is de-energized and will remain so during the servicing period. Refer to page 10 for Repair Parts Kit details of S6A Solenoid Pilot.

Disassembly (Fig. 4) - Remove Coil Housing Screw 55 and pull entire Coil and Housing Assembly, 56 through 60, upward and off of Bonnet Tube Assembly 61. Carefully remove Bonnet-Tube Assembly. Lift out Plunger-Needle Assembly 63, avoid damaging the needle. Remove Seat Assembly 64 by using a 7/16" (11 mm) socket wrench. Inspect all parts, clean or replace as needed.

Assembly (Fig. 4) - Reinstall the Seat Assembly and tighten (no gasket needed). Carefully insert the Plunger Needle Assembly. Replace the Gasket 62 and re-install Bonnet-Tube Assembly. Replace entire Coil and Housing Assembly and tighten Coil Housing Screw.

Make sure the solenoid coil is of the proper voltage and frequency.

When mounting the solenoid pilot, place the "O" Rings 50 into the proper grooves and tighten the Cap Screws 66, evenly. The ideal tightening torque is 1.1 kg-m (8 ft. lbs.).

Moduplate (Fig. 2)

The Moduplate Item #52 is used to stop the flow through the flow path of the Modudapter. Protect the "O" Ring surfaces at all times. When mounting the Moduplate, place "O" Rings 50 into the grooves (lubricate with silicone grease) and tighten the Cap Screws 53 evenly to avoid distortion and assure proper sealing. The ideal tightening torque is 1.1 Kg-m (8 ft. lbs.).

Maintenance and Service

General Procedure:

Before disassembly of regulator, make certain that all refrigerant has been removed (pumped out) from the regulator and its companion strainer where one is used. Read Safety Bulletin RSB.

Dirt in the system is the greatest single cause of regulator malfunction. All screens or filters must be cleaned or replaced when they become dirty. At start up it is especially important that these items are cleaned or changed frequently. When the RSF close-coupled companion strainers are used, maintain according to instructions in Bulletin 00-10. Moisture in halocarbon systems in particular can cause corrosion or form ice, causing the piston to freeze in position. Filter-driers should be used and maintained for halocarbon systems.

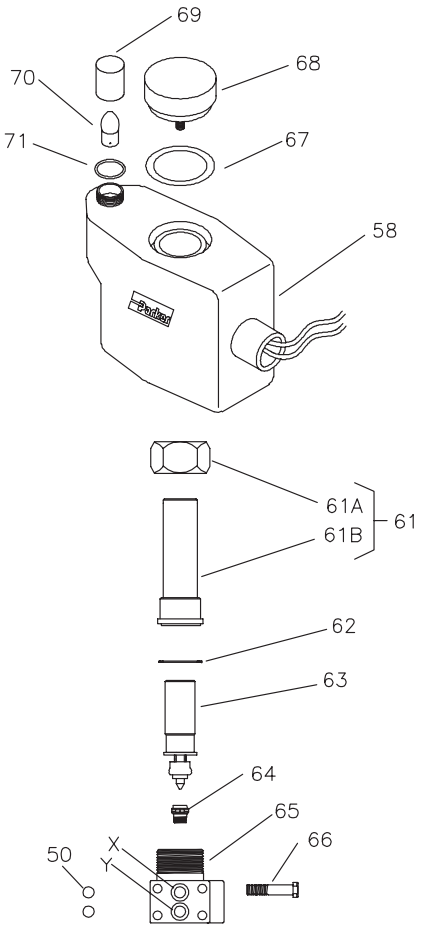
Before deciding to disassemble a regulator for servicing, the following investigations should be made:

Check the manual opening stem; it should be turned in for automatic operation.

Check the regulator setting to make sure it is properly adjusted. Turn adjusting screw slowly to see if regulator responds. Check regulator pressure range; if wrong, range spring must be replaced.

Check other system components for proper operation. Make sure that the regulator receives the proper electrical signal where modular pilot solenoids are used. Make sure they are same as the power supply.

Check hand valves in the system to make sure they are open or closed as required and the system is receiving liquid or gas as the case may be.



S6A Modular Solenoid Pilot
(For A4AOS/A4AOSE)
Fig 4

Solenoid Coils and Coil Housing

The solenoid coils and coil housing, identified and described on page 8 for the Type S6A Solenoid Pilot, are an improved design which provide a higher MOPD and a cooler coil resulting in longer life. The new coil and its heavily plated, rust resisting housing are interchangeable with the obsolete coil and cast iron housing as follows: The new coil, which has its Part Number stamped on the side, can be used in both the old and new coil housing; the old coil which has its 30-0030-XX Series Part Number stamped on one end, can be used in the old, cast iron housing only. There is no bottom marking on the new coil; either end may be positioned up. The color coding of lead wires for various voltage and frequencies has not been changed. The fuses used with the old coils are suitable for the new coils; the new coil power consumption is 33 Watts instead of 37.

The S6A pilot solenoid valve is also available with a coil using a quick electrical connector or plug, permitting easy wiring connection with an exposed rubber covered cable instead of a rigid or flexible conduit and enclosed wiring. This type of coil cannot be used with the old, cast iron housing.

The new coils and new housing described above for the S6A valve are also used with Solenoid Valve Types S4, S5, S6N, S7, S8 and S9.

Maintenance and Service (continued)

Electrical

The Refrigerating Specialties Division molded water resistance Class "B" solenoid coil 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 molded Class "B" coil is available from stock with most standard voltages. However, coils are available for other voltages and frequencies, as well as for direct current. Coils are also available as transformer type with a 6 volt secondary winding for use with the Refrigerating Specialties Division Pilot Light Assembly (see current copy of Bulletin 60-10, "Pilot Light Assembly and Solenoid Transformer Coil"). The solenoid coil must be connected to electrical lines with volts and Hertz same as stamped on coil. 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 with line voltage from 85% to 110% of rated coil voltage. Operating with a line voltage above or below these limits may result in coil burnout. Also, operating with line voltage below the limit will definitely result in lowering the valve opening pressure differential. Power consumption during normal operation will be 33 Watts or less.

Inrush and running current is listed below:

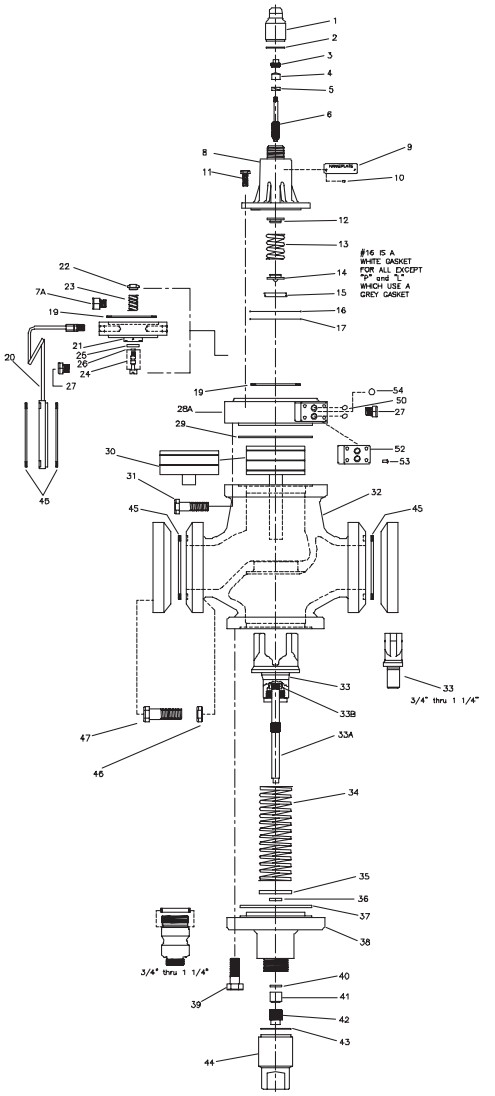
Standard Coil Volts/Hertz	Inrush Current (Amps)	Running Current (Amps)	Fuse Size (Amps)
120/60 (Blue leads)	1.86	0.46	1
208/60 (Blue & Red leads)	0.63	0.26	1
240/60 (Red leads)	0.60	0.23	1
440/60 (Yellow & Red leads)	0.39	0.13	1
115/50 (Yellow & Blue leads)	1.22	0.21	1
230/50 (Yellow leads)	0.65	0.26	1
Other	(Contact Factory)		

On transformer coil the 6 volt leads are always black.

SERVICE POINTERS (Check General Procedure)

SYMPTOM	PROBABLE REASON	CORRECTION
Regulator does not shut off flow.	Diaphragm or seat dirty, damaged or frozen.	Clean or replace. Clean strainer.
	Diaphragm follower stuck or damaged.	Clean or replace. Install follower carefully.
	Piston jammed with excess dirt.	Remove and polish piston and bore with crocus cloth. Clean valve and strainer.
	Modulating plug leaking due to excess dirt or damage.	Clean or replace. If used on liquid, check for erosion due to excessive flash gas. Reduce flash gas by subcooling or by reducing pressure drop across valve by providing restriction at valve outlet.
	Diaphragm ruptured or badly deformed.	Replace. If Range "D" make sure has 2 diaphragms.
	A4A0S/A4A0SE Modular Solenoid Pilot Seat leaking.	Check seat and needle. Replace as needed.
	Diaphragm and seat eroded due to flash gas.	Replace. Reduce flash gas by subcooling or by reducing pressure drop across regulator by providing restriction at valve outlet.
	Modular Solenoid Pilot not closing.	Check power at leads, make sure coil is de-energized.
Regulator does not open.	Pressure Regulator Diaphragm ruptured or badly deformed.	Replace. If Range D make sure has 2 diaphragms.
	Diaphragm follower stuck, damaged or frozen.	Clean or replace. Install follower carefully.
	A4A0S/A4A0SE Modular Solenoid Pilot not opening.	Pressure drop across valve too high; over 21 bar (300 psig). Lower pressure drop. Improper power supply. Correct. Replace solenoid coil.
	Piston worn, too much clearance.	Replace piston. Check for reason. If used on liquid, check for flash gas.
	Piston jammed with excess dirt.	Remove and polish piston and bore with crocus cloth. Clean valve and strainer.
Regulator Operation erratic.	Diaphragm or seat dirty or damaged.	Clean or replace. Clean strainer.
	Diaphragm follower has dirt on the outside diameter or outside diameter is damaged.	Clean or replace.
	Other system components, line controllers, thermostats, etc., erratic.	Adjust, repair or replace.
	Regulator too far oversized.	Check load. Replace with smaller regulator or investigate use of reduced capacity plug.
Pressure drop across regulator too high.	Inlet or outlet restricted.	Check for restriction. Clean strainer.
	Regulator too small.	Open manually to be sure valve is full open. Replace with proper size regulator.
	Large amount of flash gas in liquid line.	Reduce flash gas by subcooling. Reduce line restriction by increasing line size, particularly at the regulator outlet. Replace with larger regulator.
	High pressure drop causes high rate of expansion gas at regulator outlet.	Increase pipe size at the outlet of the regulator.
	Regulator does not open all the way.	Check piston for wear. Replace, if needed.

Repair Kits for A4AO, A4AOE, A4AOS and A4AOSE



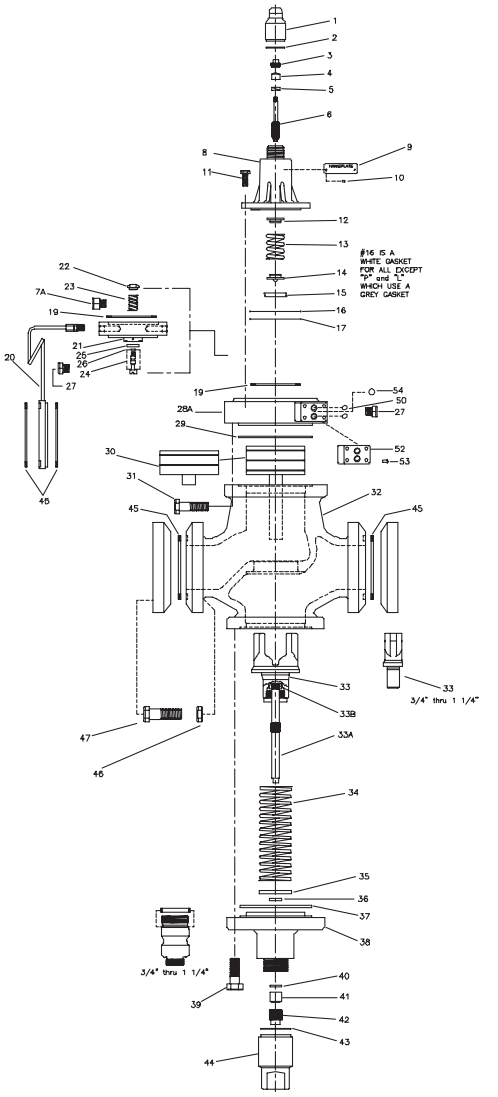
A4AO, A4AOE, A4AOS, A4AOSE
Note: 28 Adapter, 52 Moduplate used only with A4AOS/A4AOSE
28 Adapter, 52 Moduplate used only with A4AO/A4AOE
Fig. 3

			20mm (3/4")		25mm (1")	
Item No.	Description		Kit No.	Qty	Kit No.	Qty
1	Seal Cap		Only Avail. with Kit	1	Only Avail. with Kit	1
2	Seal Cap Gasket		Only Avail. with Kit	1	Only Avail. with Kit	1
1-2	Cap Kit, Seal		202110	1	202110	1
3	Nut, Packing		Only Avail. with Kit	1	Only Avail. with Kit	1
4	Packing,Stem		Only Avail. with Kit	1	Only Avail. with Kit	1
5	Washer, Flat		Only Avail. with Kit	1	Only Avail. with Kit	1
3-5	Packing Kit, Stem		202100	1	202100	1
6	Stem, Adjusting		Only Avail. with Kit	1	Only Avail. with Kit	1
4-6	Stem Kit, Adjusting		202120	1	202120	1
12	Plate, Spring, Upper		Only Avail. with Kit	1	Only Avail. with Kit	1
13	Spring, Comp.		Only Avail. with Kit	1	Only Avail. with Kit	1
14	Plate, Spring, Lower		Only Avail. with Kit	1	Only Avail. with Kit	1
15	Follower, Diaphragm		Only Avail. with Kit	1	Only Avail. with Kit	1
3-5,6,	Spring	Rge. V	202006	1	202006	1
12-15	Stem Kit	Rge. D	202007	1	202007	1
8	Bonnet		Only Avail. with Kit	1	Only Avail. with Kit	1
11	Screw, Hx. Hd.		Only Avail. with Kit	8	Only Avail. with Kit	8
16	Bonnet Gasket		Only Avail. with Kit	1	Only Avail. with Kit	1
1-6,8	Spring Kit	Rge. V	202008	1	202008	1
11-16	with Bonnet	Rge. D	202009	1	202009	1
12-14	Spring Kit	Rge. V	202481	1	202481	1
16	less Bonnet	Rge. D	202482	1	202482	1
17	Diaphragm		Only AvTl. with Kit	1	Only Avail. with Kit	1
19	Gasket		Only Avail. with Kit	1	Only Avail. with Kit	1
16,17,19	Diaphragm Kit	Rge. V	200770	1	200770	1
17	Diaphragms	Rge. D	Only Avail. with Kit	2	Only Avail. with Kit	2
16,17,19	Diaphragm Kit	Rge. D	200771	1	200771	1
19	Gasket		Only Avail. with Kit	1	Only Avail. with Kit	1
22	Nut, Retainer		Only Avail. with Kit	1	Only Avail. with Kit	1
23	Spring		Only Avail. with Kit	1	Only Avail. with Kit	1
24	Plug, Pilot		Only Avail. with Kit	1	Only Avail. with Kit	1
25	O-Ring		Only Avail. with Kit	1	Only Avail. with Kit	1
26	O-Ring		Only Avail. with Kit	1	Only Avail. with Kit	1
19,22-26	Plug Kit, Pilot		200777	1	200777	1
21	Adapter		Only Avail. with Kit	1	Only Avail. with Kit	1
19,22-26	Plug Kit, Pilot A4AO/A4AOS		Only Avail. with Kit	1	Only Avail. with Kit	1
21,19,22-26	Outlet-Regulator Kit		OR-50(200516)	1	OR-50(200516)	1
	(See List Price Schedule)					
20	Ring/Tube Assbly. Flge.		Only Avail. with Kit	1	Only Avail. with Kit	1
45	Gasket, Flange		Only Avail. with Kit	1	Only Avail. with Kit	1
20,45	Flge. Ring/Tube Kit A4AO/A4AL		FRT-20 (200439)	1	FRT-25 (200439)	1
27	Plug Pkg. 1/4" NPT		202552	5	202552	5
28	Adapter, A4AO/A4AOE		Only Avail. with Kit	1	Only Avail. with Kit	1
29	Gasket		Only Avail. with Kit	1	Only Avail. with Kit	1
19,28,29	Adapter Kit A4AO/A4AOE		200703	1	200703	1
28A	Adapter, A4AOS/A4AOSE		Only Avail. with Kit	1	Only Avail. with Kit	1
29	Gasket		Only Avail. with Kit	1	Only Avail. with Kit	1
19,28A,29	Adapter Kit A4AOS/A4AOSE		MD-25(200591)	1	MD-25 (200591)	1
	(See List Price Schedule)					
30	Piston/Stem Assembly		Only Avail. with Kit	1	Only Avail. with Kit	1
29,30	Piston Kit		200760	1	200760	1
32	Valve Body		Not Available		NotAvailable	
34	Spring, Comp.		Only Avail. with Kit	1	Only Avail. with Kit	1
35	Washer, Flat		Only Avail. with Kit	1	Only Avail. with Kit	1
36	Wiper, Dirt		Only Avail. with Kit	1	Only Avail. with Kit	1
37	"O"Ring		Only Avail. with Kit	1	Only Avail. with Kit	1
34-37	Spring Kit, Closing		202300	1	202300	1

Repair Kits for A4AO, A4AOE, A4AOS and A4AOSE

	32mm (1-1/4")		40mm (1-5/8")		50mm (2")		65mm (2-1/2")		75mm (3")		100mm (4")	
Item No.	Kit No.	Qty	Kit No.	Qty	Kit No.	Qty	Kit No.	Qty	Kit No.	Qty	Kit No.	Qty
1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
2	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
1-2	202110	1	202110	1	202110	1	202110	1	202110	1	202110	1
3	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
4	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
5	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
3-5	202100	1	202100	1	202110	1	200110	1	200110	1	200110	1
6	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
4-6	202120	1	202120	1	202120	1	202120	1	202120	1	202120	1
12	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
13	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
14	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
15	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
3-5,6	202006	1	202006	1	202006	1	202006	1	202006	1	202006	1
12-15	202007	1	202007	1	202007	1	202007	1	202007	1	202007	1
8	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
11	Only Avail. with Kit	8	Only Avail. with Kit	8	Only Avail. with Kit	8	Only Avail. with Kit	8	Only Avail. with Kit	8	Only Avail. with Kit	8
16	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
1-6,8	202008	1	202008	1	202008	1	202008	1	202008	1	202008	1
11-16	202009	1	202009	1	202009	1	202009	1	202009	1	202009	1
12-14	202481	1	202481	1	202481	1	202481	1	202481	1	202481	1
16	202482	1	202482	1	202482	1	202482	1	202482	1	202482	1
17	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
19	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
16,17,19	200770	1	200770	1	200770	1	200770	1	200770	1	200770	1
17	Only Avail. with Kit	2	Only Avail. with Kit	2	Only Avail. with Kit	2	Only Avail. with Kit	2	Only Avail. with Kit	2	Only Avail. with Kit	2
16,17,19	200771	1	200771	1	200771	1	200771	1	200771	1	200771	1
19	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
22	Only Avail, with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
23	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
24	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
25	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
26	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
19,22-26	200777	1	200777	1	200777	1	200778	1	200778	1	200778	1
21	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
19,22-26	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
21,19,22-26	OR-50 (200516)	1	OR-50 (200516)	1	OR-50 (200516)	1	OR-200 (200517)	1	OR-200 (200517)	1	OR-200 (200517)	1
20	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
45	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
20,45	FRT-32 (200441)	1	FRT-40 (200443)	1	FRT-50 (200443)	1	FRT-65 (200445)	1	FRT-75 (200447)	1	FRT-100 (200449)	1
27	202552	5	202552	5	202552	2	202552	2	202552	2	202552	2
28	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
29	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
19,28,29	200700	1	200725	1	200725	1	200685	1	200713	1	200716	1
28A	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
29	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
19,28A,29	MD-32 (200593)	1	MD-50 (200595)	1	MD-50 (200595)	1	MD-65 (200597)	1	MD-75 (200599)	1	MD-100 (200606)	1
30	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
29,30	200767	1	200389	1	200389	1	200391	1	200393	1	200227	1
32	Not Available		NotAvailable		NotAvailable		Not Available		Not Available		Not Available	
34	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
35	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
36	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
37	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
34-37	202301	1	202302	1	202302	1	202303	1	202304	1	202305	1

Repair Kits for A4A0, A4A0E, A4A0S and A4A0SE



A4AO, A4AOE, A4AOS, A4AOSE
Note: 28 Adapter, 52 Moduplate used only with A4AOS/A4AOSE
28 Adapter, 52 Moduplate used only with A4AO/A4AOE
Fig. 3

		20mm (3/4")		25mm (1")	
Item No.	Description	Kit No.	Qty	Kit No.	Qty
33	Plug/Stem Assembly	Only Avail. with Kit	1	Only Avail. with Kit	1
40	Washer, Flat	Only Avail. with Kit	1	Only Avail. with Kit	1
41	Packing, Stem	Only Avail. with Kit	1	Only Avail. with Kit	1
42	Nut, Packing	Only Avail. with Kit	1	Only Avail. with Kit	1
33,34-37,40-42	Full Cap. Plug Kit Modul.	202021	1	202022	1
33,34-37,40-42	50% Cap. Plug Kit, Modul.	202029	1	(*)	
33,34-37,40-42	35% Cap. Plug Kit, Modul.	Not Available		Not Available	
33,34-37,40-42	17% Cap. Plug Kit, Modul.	202030	1	(*)	
37	O-Ring	Only Avail. with Kit	1	Only Avail. with Kit	1
38	Cover, Bottom	Only Avail. with Kit	1	Only Avail. with Kit	1
40	Washer, Flat	Only Avail. with Kit	1	Only Avail. with Kit	1
41	Packing, Stem	Only Avail. with Kit	1	Only Avail. with Kit	1
37,38,40,41	Cover Kit	200761	1	200761	1
42	Nut, Packing	Only Avail. with Kit	1	Only Avail. with Kit	1
40-42	Packing Kit, Stem	202100	1	202100	1
43	Gasket	Only Avail. with Kit	1	Only Avail. with Kit	
44	Seal Cap	Only Avail. with Kit	8	Only Avail. with Kit	8
43,44	Seal Cap, Kit	202110	1	202110	1
33-38,40-44	Full Cap. Bottom Assembly Kit	202010	1	202011	1
33-38,40-44	50% Cap. Bottom Assembly Kit	202347	1	(*)	1
33-38,40-44	17% Cap. Bottom Assembly Kit	202346	1	(*)	1
3-6,12-19,	Full Cap. Repair				
29,30,33-37	Kit, Req. Rge. V	202040	1	202043	1
40-42	Rge. D	202042	1	202045	1
3-6,12-19,	50% Cap. Repair				
29,30,33-37	Kit. Reg. Rge. V	202354	1	(*)	1
40-42	Rge. D	202353	1	(*)	1
3-6,12-19,	17% Cap. Repair				
29,30,33-37	Kit. Reg. Rge. V	202351	1	(*)	1
40-42	Rge. D	202350	1	(*)	1
2,16(2),19(2)					
25,26,29,37,	Gasket Kit A4/S4	202112		202112	
43,45(3)					
Indv'l Gaskets, O- Rings & Valve Packing sold & packaged in qtys only as indicated					
29	Gasket Pkg. Adapter	202406	5	202406	5
37	O-Ring/Gasket Pkg. Bottom Cap	202384	3	202384	3
43	Gasket Pkg. Seal Cap (Bottom)	202408	12	202408	12
2	Gasket Pkg. Seal Cap (Top)	202408	12	202408	12
45	Gasket Pkg. Flange	202079	12	202079	12
4	Packing Pkg. Stem (Top)	202478	25	202478	2
41	Packing Pkg. Stem (Bottom)	202478	25	202478	25
Bolt Package Kits					
11	Bolt Package, A4A0 Bonnet	202247	8	202247	8
31	Bolt Package, Adapter	202248	8	202249	8
39	Bolt Package, Bottom Cap	Not Required		Not Required	
Flange Bolt Package includes bolts and nuts; no gaskets					
46,47	Bolt Kit, Flange	201585	1	201585	1

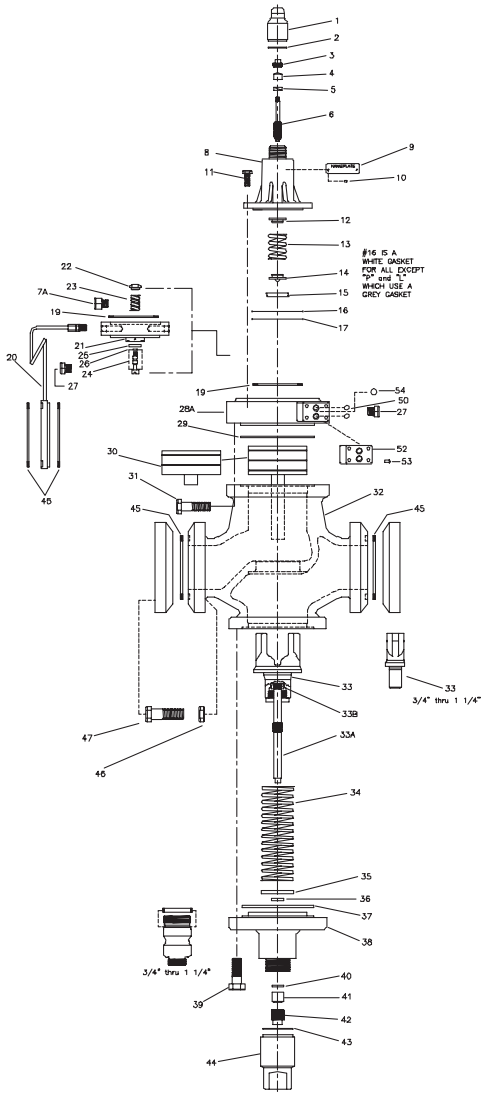
(*) All Plug Kits and Bottom Assembly Kits for 3/4" Port Size Valves can be used in the 1" Port Size Valves for reducing capacity.

Repair Kits for A4A0, A4A0E, A4A0S and A4A0SE

	32mm (1-1/4")		40mm (1-5/8")		50mm (2")		65mm (2-1/2")		75mm (3")		100mm (4")	
Item No.	Kit No.	Qty	Kit No.	Qty	Kit No.	Qty	Kit No.	Qty	Kit No.	Qty	Kit No.	Qty
33	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
40	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
41	202110	1	202110	1	202110	1	202110	1	202110	1	202110	1
42	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
33,34-37,40-42	202023	1	202024	1	202025	1	202025	1	202027	1	202028	1
33,34-37,40-42	Not Available		Not Available		Not Available		Not Available		Not Available		Not Available	
33,34-37,40-42	202031	1	202032	1	(**)		202033	1	202034	1	202035	1
33,34-37,40-42	Not Available		Not Available		Not Available		Not Available		Not Available		Not Available	
37	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
38	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
40	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
41	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
37,38,40,41	200761	1	Not Available		Not Available		Not Available		Not Available		Not Available	
42	Only Avail. with Kit	I	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
40-42	202100	1	202100	1	202100	1	202100	1	202101	1	202101	1
43	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
44	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1	Only Avail. with Kit	1
43,44	202110	1	202110	1	202110	1	202110	1	202110	1	202110	1
33-38,40-44	202012	1	202013	1	202014	1	202015	1	202016	1	202017	1
33-38,40-44	Not Available		Not Available		Not Available		Not Available		Not Available		Not Available	
33-38,40-44	Not Available		Not Available		Not Available		Not Available		Not Available		Not Available	
3-6,12-19	202047	1	202050	1	202053	1	202056	1	202059	1	202062	1
29,30,33-37	202046	1	202049	1	202052	1	202055	1	202058	1	202061	1
40-42	202048	1	202051	1	202054	1	202057	1	202060	1	202063	1
3-6,12-19, 29-30,33-37, 40-42	NOTE: 50% Capacity Repair Kit is not available for port sizes 1-1/4" to 4". Capacity reduction can be obrtained through use of field installing "Reduced Capacity Plug Kits". See description and contents of these kits elsewhere in this section.											
3-6,12-19, 29-30,33-37, 40-42	NOTE: 17% Capacity Repair Kit is not available for port sizes 1-1/4" to 4". Capacity reduction can be obrtained through use of field installing "Reduced Capacity Plug Kits". See description and contents of these kits elsewhere in this section.											
2,16(2),19(2)	Gasket Kits (includes complete set of gaskets plus O-Rings if applicable)											
25,26,29,37	202113		202114		202114		202115		202116		202117	
43,45(3)												
	Individual Gaskets, O- Rings and Valve Packing sold and packaged in quantities only as directed.											
29	202407	5	202397	3	202397	3	202396	3	202399	3	202400	3
37	202384	3	202374	6	202374	6	202374	6	202382	3	202383	3
43	202408	12	202408	12	202408	12	202408	12	202404	5	202404	5
2	202408	12	202408	12	202408	12	202408	12	202408	12	202408	12
45	202080	12	202081	12	202081	12	202082	12	202083	12	202084	12
4	202478	25	202478	25	202478	25	202478	25	202478	25	202478	25
41	202478	25	202478	25	202478	25	202478	25	202479	5	202471	5
	Bolt Package Kits											
11	202247	8	202247	8	202247	8	202247	8	202247	8	202247	8
31	202248	8	202249	8	202249	8	202249	8	202250	6	202250	6
39	Not Required		202251	6	202251	6	202251	6	202252	6	202252	6
	Flange Bolt Package includes bolts and nuts; no gaskets											
46,47	201595	1	201604	1	201604	1	201611	1	201611	1	201620	1

(*) All Plug Kits and Bottom Assembly Kits for 3/4" Port Size Valves can be used in the 1" Port Size Valves for reducing capacity.

Repair Kits for A4A0, A4A0E, A4A0S and A4A0SE



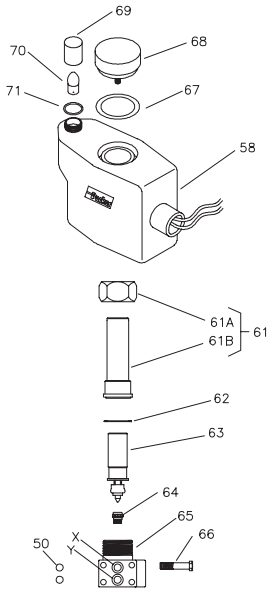
A4AO, A4AOE, A4AOS, A4AOSE
Note: 28 Adapter, 52 Moduplate used only with A4AOS/A4AOSE
28 Adapter, 52 Moduplate used only with A4AO/A4AOE
Fig. 3

		20mm (3/4")		25mm (1")	
Item No.	Description	Kit No.	Qty	Kit No.	Qty
	Flange Bolt Package includes bolts and nuts; no gaskets				
50,52-54	Moduplate Kit "MP"	200518		200518	
52	Moduplate	Only Avail. with Kit	1	Only Avail. with Kit	1
54	O-Ring, "B"	Only Avail. with Kit	1	Only Avail. with Kit	1
50	O-Ring, "S", "D"	Only Avail. with Kit	2	Only Avail. with Kit	2

	Flange Kit	FK-20				FK-25			
	Specify Flange, Style, Connection, Size	FPT, SW, WN		ODS		FPT, SW, WN		ODS	
	Kit includes 2 Flanges only	Std	Also Avail	Std	Also Avail	Std	Also Avail	Std	Also Avail
		3/4	1,1¼	7/8	11/8, 13/8	1	3/4, 1¼	11/8	13/8, 15/8

Repair Kits for S6A Modular Pressure Pilot Solenoid

Item	Description	Qty	Kit Number
55	Screw	1	Only Avail. with Kit
58	Coil Assemly	1	See Page 8
67	O-Ring	1	Only Avail. with Kit
68	Knob	1	Only Avail. with Kit
67, 68	Knob Kit	1	205047
69	Lens	1	Only Avail. with Kit
70	Bulb Kit	6	205282
71	O-Ring	1	Only Avail. with Kit
69 , 71	Lens Kit	6	205279
61B	Tube Assembly, Solenoid	1	Only Avail. with Kit
61A	Nut, Solenoid Tube	1	Only Avail. with Kit
62	Gasket	1	Only Avail. with Kit
61A,61B 62	Tube Kit, Solenoid	1	201036
50	O-Ring	2	Only Avail. with Kit Also available in package. See below.
66	Botts	4	Only Avail. with Kit
50,66	Bolt/"O"Ring Kit	1	201574
62	Gasket	1	Only Avail. with Kit
63	Plunger/Needle Assembly	1	Only Avail. with Kit
62,63	Plunger Kit, Needle	1	202019
62	Gasket	1	Only Avail. with Kit
63	Plunger/Needle Assembly	1	Only Avail. with Kit
62,63	Plunger Kit, Needle (D.C. only)	1	201021
62	Gasket	1	Only Avail. with Kit
63	Plunger/Needle Assembly	1	Only Avail. with Kit
64	SeatAssembly	1	Only Avail. with Kit



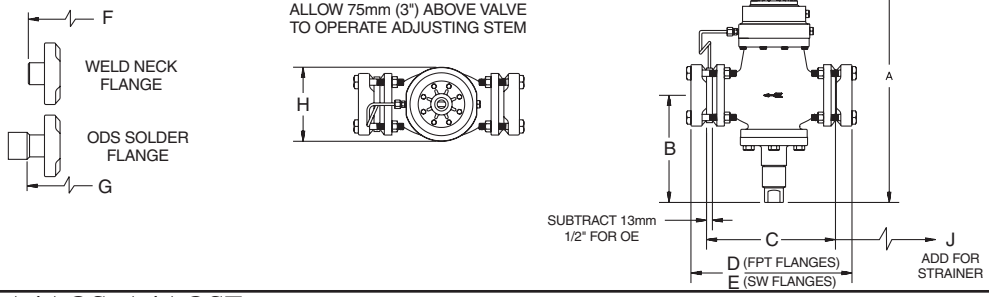
S6A Modular Solenoid Pilot (for A4AOS/A4AOSE) Port Sizes 20-100mm 3/4" - 4" Fig. 4

Repair Kits for A4A0, A4A0E, A4A0S and A4A0SE

	32mm (1-1/4")	40mm (1-5/8")	50mm (2")	65mm (2-1/2")	75mm (3")	100mm (4")
Flange Bolt Package includes bolts and nuts; no gaskets (cont'd from page 9)						
Item No.	Kit No. Qty	Kit No. Qty	Kit No. Qty	Kit No. Qty	Kit No. Qty	Kit No. Qty
50,52-54	200518	200518	200518	200518	200518	200518
52	Only Avail. with Kit 1	Only Avail. with Kit 1	Only Avail. with Kit 1	Only Avail. with Kit 1	Only Avail. with Kit 1	Only Avail. with Kit 1
54	Only Avail. with Kit 1	Only Avail. with Kit 1	Only Avail. with Kit 1	Only Avail. with Kit 1	Only Avail. with Kit 1	Only Avail. with Kit 1
50	Only Avail. with Kit 1	Only Avail. with Kit 1	Only Avail. with Kit 1	Only Avail. with Kit 1	Only Avail. with Kit 1	Only Avail. with Kit 1

	FK-32				FK-40				FK-50				FK-65				FK-75				FK-100			
	FPT, SW, WN		ODS		FPT, SW, WN		ODS		FPT, SW, WN		ODS		FPT, SW, WN		ODS		FPT, SW, WN		ODS		FPT, SW, WN		ODS	
	Std	Also Avail	Std	Also Avail	Std	Also Avail	Std	Also Avail	Std	Also Avail	Std	Also Avail	Std	Also Avail	Std	Also Avail	Std	Also Avail	Std	Also Avail	Std	Also Avail	Std	Also Avail
	1¼	1½	13/8	15/8, 21/8	1½	2	15/8	21/8, 25/8	2	1½	21/8	25/8	25/8		25/8	31/8	3		31/8	35/8	4		41/8	

A4AO, A4AOE



A4AOS, A4AOSE

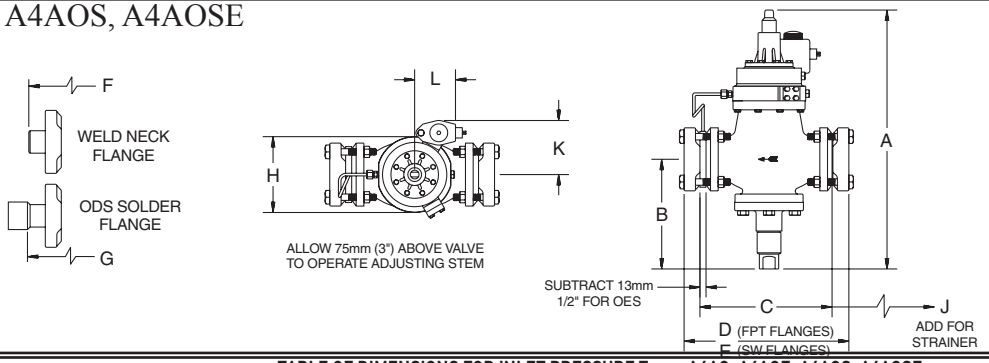


TABLE OF DIMENSIONS FOR INLET PRESSURE Types A4A0, A4A0E, A4A0S, A4A0SE

TYPE	20mm & 25mm (3/4 & 1 ")			32mm (1-1/4")			40mm & 50mm (1-5/8 & 2")			65mm (2-1/2")			75mm (3")			100mm (4")		
DIMENSIONS		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
D (FPT) FOR PIPE SIZES SHOWN	1/2"	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
	3/4"	229	9.0															
	1"	229	9.0	1-1/2"	269	10.6												
	1-1/4"	229	9.0															
E (S.W.)FOR PIPE SIZES SHOWN	1/2"	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
	3/4"	229	9.0															
	1"	229	9.0	1-1/2"	269	10.6	2"	320	12.6									
	1-1/4"	229	9.0															
F (W.N.) FOR PIPE SIZES SHOWN	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	10.0															
G (O.D.S.) FOR TUBE SIZES SHOWN	7/8"	252	9.9							2-5/8"	361	14.2	3-1/8"	427	16.8	4-1/8"	516	20.3
	1-1/8"	252	9.9	1-3/8"	282	11.1	1-5/8"	371	14.6									
	1-3/8"	244	9.6	1-5/8"	292	11.5	2-1/8"	351	13.8	3-1/8"	402	15.8	3-5/8"	445	17.5			
	1-5/8"	252	9.9	2-1/8"	318	12.5	2-5/8"	371	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

VALVE SIZE		FPT FLANGES		WELDING FLANGES						FLANGES						
		Nom. Pipe Size	Flange Pkg. No. (2/Pkg)	Nominal Pipe Size		Sock Weld Socket I.D.		Weld Neck Neck O.D.		Flange Package Number(2/Pkg)		Tubing O.D.		Fitting I.D.		Flge Pkg. No. (2/Pkg)
mm	Inches	Inches		Inches	NW No.	Inches	mm	Inches	mm	Socket Weld	Weld Neck	Inches	mm	Inches	mm	
20	3/4	3/4	200016	3/4	20	1.070	27.81	1.050	26.67	200020	200023	1-1/8	28.57	1.130	28.70	200027
and	and	1	200017	1	25	1.365	34.67	1.315	33.40	200021	200024	1-3/8	34.92	1.380	33.05	200028
25	1	1-1/4	200018	1-1/4	32	1.705	43.31	1.660	42.16	200022	200025	1-5/8	41.27	1.631	41.43	200029
		1-1/4	200030	1-1/4	32	1.705	43.31	1.660	42.16	200032	200034	1-3/8	34.92	1.380	35.05	200036
32	1-1/4	1-1/2	200031	1-1/2	40	1.930	49.02	1.900	48.26	200033	200035	1-5/8	41.27	1.631	41.43	200037
												2-1/8	53.97	2.131	54.13	200038
40	1-5/8	1-1/2	200039	1-1/2	40	1.930	49.02	1.900	48.26	200041	200043	1-5/8	41.27	1.631	41.43	200045
and	and	2	200040	2	50	2.445	62.10	2.375	60.33	200042	200044	2-1/8	53.97	2.131	54.13	200046
50	2											2-5/8	66.67	2.631	66.83	200047
65	2-1/2	2-1/2	200048	2-1/2	65	2.945	—	2.875	73.03	200049	200050	2-5/8	66.67	2.631	66.83	200051
												3-1/8	79.37	3.131	79.53	200052
75	3	3	200053	3	80	3.575	90.81	3.500	88.90	200054	200055	3-1/8	79.37	3.131	79.53	200056
												3-5/8	92.07	3.631	92.23	200057
100	4	4	200062	4	100	4.575	116.20	4.500	114.30	200063	200064	4-1/8	104.77	4.132	104.95	200065

Definitions:
ODS - Outside Diameter Sweat
I.D. - Inside Diameter
O.D. - Outside Diameter
N.A. - Not Available

Flange Bolt Torque Requirements

Bolt Diameter	Valve Port Size	Torque
11mm (7/16")	13mm (1/2 ")	3.9 mkg (28 ft lb)
16mm (5/8")	20-50mm (3/4 "- 2")	11.8 mkg (85 ft lb)
19mm (3/4")	65-75mm (2-1/2 "- 3")	14.5 mkg (105 ft lb)

Safe Operation (See also Bulletin RSBCV)

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 Safety Bulletin RSB prior to installation or servicing work.

Where cold refrigerant liquid lines are used, it is necessary that certain precautions be 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. Check valves must never be installed upstream of solenoid valves, or regulators with electric shutoff, 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.

Warranty

All Refrigerating Specialties Products are warranted against defect in workmanship and materials for a period of one year from date of shipment from 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 or repaired in the field; damaged intransit, 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 OR MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE. 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.