Dual Gas Powered Suction Stop Valve

Product Bulletin 50-24 E

Type: CK-2D

Purpose:

The CK-2D normally open gas powered suction stop valve from Parker offers an economical solution to the equalization step in the defrost cycle. Another feature of the CK-2D is its ability to stay closed if power is loss during a defrost cycle. This can prevent potentially damaging shock to refrigeration piping.

The CK-2D valve is typically used in applications like overfeed or flooded systems, wet return lines, and on the liquid and gas return legs of flooded evaporators.



Contact Information:

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Product Features:

- Suitable for Ammonia, R-22, R-134a, R-404A, R-410A, R-507, and Other Common Refrigerants.
- Economical Solution to Evaporator Equalization after Defrost.
- Low Pressure Drop.
- Heavy Return Spring.
- Normally Open.
- Manual Opening Stem.
- Integrated S6B Pilot Solenoids.

- Complies with ASME B31.5 and PED 2014/68EU.
- Port Sizes: 40 to 100 mm (1-5/8 to 4").
- Use in Vertical or Horizontal Lines.
- Temperature Range: -51 to 104°C (-60 to 220°F).
- Maximum Rated Pressure (MRP): 28 barg (406 psig).
- Minimum Pressure Drop to Close: 0.35 bar (5 psi).



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Technical Data

| Body Material Ductile Iron |
|--|
| Seat Material Ductile Iron |
| Refrigerant Temperature Range*51 to 104°C (-60 to 220°F) |
| Ambient Temperature Range: |
| AC Coils |
| DC Coils |
| |

Maximum Rated Pressure (MRP)28 bar (406 psig)

Description

The CK-2D is based on the same valve body and operational principles as the standard CK-2 valves making for easy field replacements. This heavy duty gas-powered valve is suitable for ammonia, R-22, other refrigerants, certain oils and other fluids approved for use in refrigeration. The CK-2D is a pilot operated, dual-position valve. The CK-2D is a normally open valve and will open on power failure. This valve is equipped with a manual opening stem.

The Type CK-2D Gas-Powered Valve is furnished with FPT Internal NPT (U.S. Standard Taper Pipe Thread), Socket Weld, Weld Neck or ODS (solders over copper piping of given diameter) connections. The valve may be easily removed from between the flanges for servicing.

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| Minimum Pressure to Open | 0 bar (0 psig) |
|---|----------------|
| Minimum Pressure above, Inlet Pressure to C | Close Valve |
| Complies with ASME B31.5 and PED 2014/68 | BEU |

* Recommended application temperature above -32°C (-25°F). Contact factory for proper selection assistance, if required.

Purpose & Applications

These valves are employed as low pressure drop, gas-powered suction stop valves for low temperature evaporators. Because of the return spring, there is no line pressure drop required to open the valve during refrigeration. This allows for a minimal pressure drop penalty in the suction line. The CK-2D will positively close the suction line allowing for defrost to occur. The dual position feature permits the evaporator pressure to equalize through the CK-2D with the suction pressure after a defrost cycle has occurred. The intermediate stage allows for this equalization to occur in a controlled manner without the need for an externally piped equalizing solenoid.

This valve is designed for a positive closing of the suction line, liquid overfeed, flooded evaporator gas return lines during defrosting in low temperature applications. Due to it is a gas power suction stop valve that closes, the valve can operate even under oil conditions. Recommendations assume no highly viscous oil, dirt, moisture or foreign substance in refrigerant; also no abnormal shock impact below -32°C (-25°F).

| CK-2D Valve General Information | | | | | | | | | | | | | |
|---------------------------------|------|-----|---------|-------------------------|----------|---------|--|-------------------------|------------------------|-----|---|-----|--------|
| Dest | | | | | Conne | ections | | | Weight | | | | |
| Port | Size | | emcient | FPT ^[1] , \$ | SW, WN | O | DS | Pilot Solenoid | With Flanges Less Flar | | Pilot Solenoid With Flanges Less Fla | | langes |
| mm | inch | Kν | Cv | mm | inch | mm | inch | | Kg | Lbs | Kg | Lbs | |
| 40 | 15⁄8 | 32 | 37 | 38*,50 | 11⁄2*, 2 | 54*,66 | 2 ¹ / _{8*} ,2 ⁵ / ₈ | S6B ^[2] /S6A | 28 | 62 | 26 | 57 | |
| 50 | 2 | 44 | 51 | 40,50* | 1½, 2* | 54*,66 | 2 ¹ / _{8*} , 2 ⁵ / ₈ | S6B ^[2] /S6A | 28 | 62 | 26 | 57 | |
| 65 | 21⁄2 | 70 | 82 | 65*,80 | 21⁄2*, 3 | 66*,80 | 2 ⁵ / _{8*} ,3 ¹ / ₈ | S6B ^[2] /S6A | 36 | 79 | 34 | 75 | |
| 75 | 3 | 103 | 120 | 75 | 3 | 80*,92 | 3 ¹ / _{8*} ,3 ⁵ / ₈ | S6B ^[2] /S6A | 50 | 110 | 49 | 108 | |
| 100 | 4 | 171 | 200 | 100 | 4 | 105 | 4 ¹ / ₈ | S6A | 74 | 163 | 60 | 132 | |

*Standard Connection.

1. FPT Flanges are only available in sizes: 32 to 50 mm (1-1/4 to 2").

2. Valves containing S6B coils can be installed in a vertical or horizontal position.

Parts Description



Principle of Operation

The CK-2D is a normally open valve which uses discharge gas to power the valve closed. For closing of the CK-2D, either energize both solenoid coils simultaneously, or energize solenoid coil #2 initially allowing condenser gas pressure or pressure from another source to act on the secondary piston forcing it down and closing the valve to the 1st stage. Then while keeping solenoid coil #2 energized, solenoid coil #1 is energized allowing gas pressure to act on the primary piston forcing it down, compressing the spring fully, and firmly seating on the valve seat bead.

Sporlan Division - Refrigeration Business Unit recommends utilizing an oil free source of gas such as that from the top of the high-pressure receiver, or rotary screw compressor system. The valve will not close unless pressure above the pistons exceeds the downstream pressure by at least 0.35 bar (5 psi). If an attempt is made to fully close the valve by only energizing solenoid coil #1, a far greater amount of pressure will be required to act upon the main piston. So, to fully close the valve: energize both solenoid coils simultaneously; or energize solenoid coil#2, then solenoid coil #1.

For line equalization solenoid coil #1 is de-energized, while solenoid coil #2 remains energized, allowing the primary piston to move up to the bottom of the secondary piston (top), allowing for evaporator equalization after defrost. So, for equalization: keep solenoid coil #2 energized while de-energizing solenoid coil #1. This will allow the valve to open the equivalent of a 1" valve.

The length of time the valve is left in the equalization position is controlled by the time set in the equalization stage on the defrost controller or PLC.

After the termination of the hot gas injection period, any style of suction stop valve must reopen in order for refrigeration to resume. For the CK-2D to open, the valve's pilot solenoids de-energize, thereby interrupting the pilot stream flow of discharge gas to the top of the valve's pistons. (See Figure 1 and 2). De-energizing only the solenoid feeding the lower piston will allow some flow to pass and equalize pressures between the coil and the suction line. It is imperative to allow sufficient time for this equalization. By design, a standard CK-2 or a competitive valve of similar design would open immediately as residual coil pressure surges through the valve should power to the pilot solenoid suddenly be interrupted during a defrost.



| CK-2D Function | | | | | |
|----------------|--------------|-----------------------|--|--|--|
| Coil | Action | Function | | | |
| #1 | De-energized | Full Open | | | |
| #2 | De-energized | During Refrigeration) | | | |
| #1 | Energized | Full Close | | | |
| #2 | Energized | (Defrost) | | | |
| #1 | De-energized | Faultization | | | |
| #2 | Energized | Equalization | | | |

SEQUENCY TO CLOSE: First energize Coil #2 and then Coil #1. This way you avoid bypass gas and close the valve.

Electrical

The pilot solenoids used on CK-2D stop valves, type S6A or S6B, are unique to the Sporlan Division - Refrigeration Business Unit line of control valves. The coils are designed for long life and powerful opening force. The standard coil housing meets special requirements, this sealed construction can withstand direct contact with moisture and ice. For class "H" coil construction will permit coil temperatures, as measured by resistance method, as high as 180°C (356°F). By definition, class "F" coil construction will permit coil temperatures, as measured by resistance method, as high as 180°C (356°F). By definition, class "F" coil construction will permit coil temperatures, as measured by resistance method, as high as 155°C (311°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. A solenoid coil should never be energized except when mounted on its corresponding solenoid tube.

The solenoid coil must be connected to an electrical line with Volts and Hertz the same as stamped on the 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 coil voltage above or below these limits may result in coil burnout. Also, operating with a coil voltage below the limit will definitely result in lowering the valve's maximum opening pressure differential.

| Pilot | Туре | Image | Terminal Diagram | Classification | Voltages/ Frequencies | Wattage (Holding) | Certifications |
|---------|--------|-------|--|--|--|--|--------------------------------|
| S6A DIN | Leaded | | Start Winding: White Wire End Winding: Black Wire | Class "F" approved system with housing meeting 3R and 4 requirements 18" Leaded Wires NEMA 3R and 4 | 24 VAC/50 Hz 24 VAC/60 Hz 115 VAC/50 Hz 120 VAC/60 Hz 208 VAC/60 Hz 230 VAC/50 Hz 240 VAC/50 Hz 240 VAC/60 Hz 12 VDC ^[1] 24 VDC ^[1] | - 34.0 34.0 32.5 32.5 35.0 37.5 - 32 | CSA UL ^[2] |
| | | | Ground | Class "F" approved system with housing meeting 3R and 4 requirements NEMA 3R and 4 IP65 | 24 VAC/50 Hz 48 VAC/50 Hz 115 VAC/50 Hz 230 VAC/50 Hz 240 VAC/50 Hz | 42.5 N/A 34.5 30.0 | CSA CE UL ^[2] |
| | | | Ground | Class "F" approved system with housing meeting 3R and 4 requirements NEMA 3R and 4 | 24 VAC/60 Hz 120 VAC/60 Hz 240 VAC/60 Hz 24 VDC ^[1] 48 VDC ^[1] | 35.5 37.5 32.0 42.5 | CSA UL ^[2] |
| S6B | Leaded | | Start Winding: White Wire End Winding: Black Wire | Standard Molded Class "H" #18 AWG 18" Leaded Wires NEMA 3R and 4 | 110/120 VAC 50/60 Hz 208 VAC 60 Hz 220-240 VAC 50/60 Hz | 18.5 W | CE |

Notes:

- Consult factory for other voltages/frequencies.

- See current price list ILP- for coil part numbers.

- Optional LED pilot light knob kit (green or red) that indicates when the coil is energized. LED knob kits can be used with 115 to 240 Volts AC coils only. [1] DC coils are limited to an ambient temperature of -25°C to 60°C (-13°F to 140°F).

[2] Only on approved coils.

CK-2D General Coil Information

| S6B Coils | | | | | | | | |
|--------------------|---------------|-----------------|-----------------------------|------------------------------|------------------------|-----------------|--|--|
| Coil (Volts/Hz) | Power Lead | Neutral Lead | Inrush Current (Amps) | Running Current (Amps) | Fuse Size (Amps) | Temp °C (°F) | | |
| 110-120 /50-60 | Black | Green | 0.66 | 0.42 | 1 | | | |
| 208/50 | Black | Green | 0.35 | 0.22 | 1 | 180 (356) | | |
| 220-240 /50-60 | Black | Green | 0.33 | 0.21 | 1 | | | |

| S6A Coils | | | | | | | | |
|--------------------|---------------|-----------------|-----------------------------|------------------------------|------------------------|-----------------|--|--|
| Coil (Volts/Hz) | Power Lead | Neutral Lead | Inrush Current (Amps) | Running Current (Amps) | Fuse Size (Amps) | Temp °C (°F) | | |
| 24/50 | Brown | White | 6.82 | 2.99 | 4 | 250 (482) | | |
| 24/60 | Brown | White | 6.70 | 2.73 | 4 | 250 (482) | | |
| 48/50 | Brown | White | - | 1.07 | - | 250 (482) | | |
| 115/50 | Purple | White | 1.22 | 0.21 | 1 | 90 (194) | | |
| 120/60 | Blue | White | 1.18 | 0.46 | 1 | 90 (194) | | |
| 208/60 | Red | White | 0.63 | 0.24 | 1 | 90 (194) | | |
| 230/50 | Yellow | White | 0.65 | 0.26 | 1 | 90 (194) | | |
| 240/50 | Black | White | 0.59 | 0.24 | 1 | 90 (194) | | |
| 240/60 | Orange | White | 0.60 | 0.23 | 1 | 98 (208) | | |
| 12 DC | Brown | White | _ | - | - | - | | |
| 24 DC | Brown | White | 6.70 | 6.70 | - | 204 (400) | | |
| 48 DC | Brown | White | - | _ | - | _ | | |

Note: Leaded coils are provided with 18 gauge wires at 914 mm (36") in length.

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CK-2D Material List

| Dual | Gas | Powered | Suction | Stop | Valve | (CK-2D) |
|------|-----|---------|---------|------|-------|---------|
| | | | | | | |

| Item | Description | Material | Qty |
|------|--|---------------------------------------|-----|
| 1 | Bolt, Disc Strainer ⁷ / ₁₆ " 14 x 2- ½" L | Steel Grade 5 Zinc | 2 |
| 2 | Flange, Disc Strainer | ASTM A-105 | 2 |
| 3 | Gasket, Disc Strainer | Garlock 2930 Non-asbestos | 2 |
| 4 | Strainer, Disc, 60 mesh | Carbon 1213/1215 | 1 |
| 5 | Nut, Disc Strainer | 416 SS | 2 |
| 6 | Pipe, Nipple ¾" x 2L Disc Strainer | 1117 Steel | 1 |
| | Screw, Cover - Adapter, CK-2D, Body 40 to 50 mm (1- ⁵ / ₈ to 2") ³ / ₈ " - 16 X 2- ¹ / ₄ " L | | |
| 7 | Screw, Cover - Adapter, CK-2D, Body 65 mm (2-½") ¾" - 16 X 2- ½" L | Steel Grade 5 Zinc | 6 |
| · | Screw, Cover - Adapter, CK-2D, Body 75 mm (3") ⁵ ⁄ ₄ " - 11 X 4- ½" L | | |
| | Screw, Cover - Adapter, CK-6D, Body 100 mm (4") %" - 11 X 5 L | | |
| 8 | Name Plate, CK-2D | Aluminum | 1 |
| 9 | Bolt, Name Plate, CK-2D | Stl. Zinc Plated | 2 |
| 10 | Adapter, CK-2D | Cast Iron GGG 40.3 | 1 |
| 11 | Clip Retainer for S6B Coil Solenoid Pilot | Spring Steel | 1 |
| 12 | Coil for S6B Solenoid Pilot | Standard Molded Class H | 1 |
| 13 | Body, S6B Solenoid Pilot | AISI 1214 steel | 1 |
| 14 | Bolt, S6A/S6B Solenoid Pilot HEX HD ¼" - 20 x 2-¼" L | Steel Grade 5 Zinc | 8 |
| 15 | O-ring, S6A & S6B | Neoprene | 6 |
| 16 | Gasket, Adapter/Cover, CK-2D | Garlock 2930 Non-asbestos | 1 |
| 17 | Piston, Top, CK-2D | 1215 CRS or 1117 Steel and 1018 CR | 1 |
| 18 | Bore Plate, CK-2D | Cast Iron GGG 40.3 | 1 |
| 19 | Gasket, Body, CK-2D | Garlock 2930 Non-asbestos | 1 |
| 20 | Piston Plug, CK-2D | Ductile Iron per ASTM A-536 | 1 |
| 21 | Spring, Manual Opening, CK-2D | ASTM A229 | 1 |
| 22 | Stem, Manual Opening, CK-2D | 416 SS | 1 |
| 23 | Body CK-2D | Ductile Iron per DIN GGG 40.3 | 1 |
| 24 | Screw, Bore Plate, CK-2D Body 40 to 65 mm (1- ⁵ % to 2- ¹ / ₂ ") ⁵ / ₁₆ " - 18 X 1- ¹ / ₄ " L | Steel Grade 5 Zinc | 8 |
| | Nut Flange, CK-2D Body 40 to 50 mm (1-5⁄k to 2") 5⁄k" - 11 | | |
| 25 | 1000 Flange, CK-2D Body 65 to 75 mm (2-1/2 to 3") ¾" - 10 Nut Flange, CK-2D | Steel | 8 |
| | Body 100 mm (4") ⁷ / ₈ " - 9 | | |

| Item | Description | Material | Qty |
|------|--|----------------------------------|-----|
| 26 | Gasket, Flange, CK-2D | Garlock 2930 Non-asbestos | 2 |
| 27 | Male Flange, CK-2D Body 40 to 100 mm (1- ⁵ ⁄k to 4") | ASTM A-105 | 2 |
| | Bolt Flange, CK-2D Body, 40 to 50 mm (1- ⁵ ⁄k to 2") BLT, SQ HD ⁵ ⁄k" - 11X 3- ¹ ⁄4"L | | |
| 28 | Bolt Flange, CK-2D Body, 65 to 75 mm (2-½ to 3") BLT, SQ HD ¾" - 10 X 3-¾"L | ASTM A 307 GR A ZINC | 8 |
| | Bolt Flange, CK-2D Body, 100 mm (4") BLT, SQ HD ⁷ / ₈ "- 9 X 4-½"L | | |
| 29 | Washer, Flat, CK-2D | Soft AISI 1010 Carbon Steel | 1 |
| 30 | Packing, Stem, CK-2D | ASTM F2168 | 1 |
| 31 | Nut, Packing, CK-2D | 416 SS | 1 |
| 32 | Gasket, Seal Cap Bottom, CK-2D | Nylon | 1 |
| 33 | Seal Cap, CK-2D | Aluminum 2011-T3 | 1 |
| 34L | LED Knob Kit, S6A Coil, Solenoid Pilot | _ | 1 |
| 34S | Standard Knob Kit, S6A Coil, Solenoid Pilot | _ | 1 |
| 35 | O-ring, S6A Coil Solenoid Pilot | Ethylene Propylene | 1 |
| 36 | Coil for S6A Solenoid Pilot | Encapsulated | 1 |
| 37 | Nut, Solenoid Tube, S6A Solenoid Pilot | Steel AISI 1010 or AISI 12L14 | 1 |
| 38 | Solenoid Tube S6A, VAC Coil, Solenoid Pilot | 304 S.S. | 1 |
| 39 | Gasket, Tube S6A, Solenoid Pilot | Wolverine | 2 |
| 40A | Plunger/Needle Assembly S6A, VAC Coil | Silicon Iron B Steel | 1 |
| 40D | Plunger/Needle Assembly S6A, VDC Coil | Silicon Iron B Steel | 1 |
| 41 | Seat Assembly, S6A Solenoid Pilot | 416 S.S. ASTM A484 | 1 |
| 42 | Body, S6A Solenoid Pilot | ASTM A536 | 1 |

CK-2D Replacement Part Kits

| | | | Port Size | | | | | | | | | | |
|------------------------|--|-------------------|---|------------------------------|-------------------------------------|---------------------------------|----------------|--|--|--|--|--|--|
| Item | Kit Des | cription | 40 mm (1%") | 50 mm (2") | 65 mm (2½") | 75 mm (3") | 100 mm (4") | | | | | | |
| | | 10mm (¾") FPT | | | 201665 | | | | | | | | |
| | Strainer Kit Disc with | 10mm (¾") SW | | | 201704 | | | | | | | | |
| 1-6 | Flanges, Bolts, Nuts, | 13mm (½") FPT | | | 201706 | | | | | | | | |
| | and Gaskets | 13mm (½") SW | | | 201707 | | | | | | | | |
| | | 20mm (¾") SW | 201710 | | | | | | | | | | |
| 1(2), 5(2) | Bolts and Nuts, for D | isc Strainer | | | 201580 | | | | | | | | |
| 3(2), 4 | Strainer Kit, Disc | | 200912 | | | | | | | | | | |
| 3(12) | Gasket Kit, Disc Strai | ner | 202078 | | | | | | | | | | |
| 7(6), 10, 16-19, 24(8) | Adapter/Bore Plate K | it, CK-2D | 251 | 003* | 251009* | - | _ | | | | | | |
| 7(6), 10, 16-19 | Adapter/Bore Plate K | it, CK-2D | | _ | ` | 251015* | 251021* | | | | | | |
| 11(12) | Clip Retainer for S6B | Coil, Kit | | | 206516 | | | | | | | | |
| 12 | Coil, S6B, Solenoid P | ilot | Refers | to current pric according | e list ILP- to ge to voltage and | et the coil part i frequency | number | | | | | | |
| 15(2), 13, 14(4) | Modular Solenoid Pilo | ot, S6B | 205073 | | | | | | | | | | |
| 14(4), 15(2) | Bolt/O-ring Kit, S6A o S6B Solenoid Pilot | pr | | | 201574 | | | | | | | | |
| 15(12) | O-ring Pkg, Pressure | Pilot | | | 202424 | | | | | | | | |
| 19-20 | Piston Plug Kit, CK-2 | C | 201140 | 201139 | 201117 | 201121 | 201226 | | | | | | |
| 21 | Spring Kit, CK-2D | | 301 | 490 | 301494 | 301505 | 301500 | | | | | | |
| 22, 29-31 | Stem Kit, CK-2D | | 201 | 133 | 201118 | 201216 | 251123 | | | | | | |
| 25(4), 26(1), 28(4) | Union Kit per Flange (| CK-2D | 206 | 516 | 206217 | 206218 | 206219 | | | | | | |
| 25(8), 28(8) | Bolts and Nuts Pkg. Flanges per CK-2D Va | alve | 201 | 604 | 201 | 614 | 206052 | | | | | | |
| 26(12) | Gasket Kit, Flange Ck | K-2D | 202 | 081 | 202082 | 202083 | 202084 | | | | | | |
| | | FPT | 200039 | 200040 | _ | _ | _ | | | | | | |
| | [| SW | 200041 | 200042 | 200049 | 200054 | 200063 | | | | | | |
| | | WN | 200043 | 200044 | 200050 | 200055 | 200064 | | | | | | |
| 27(2) | Flange, CK-2D | 2-1% ODS | 200 | 046 | _ | - | | | | | | | |
| | Body | 2-5% ODS | 200 | 047 | 200051 | _ | | | | | | | |
| | | 3-% ODS | _ | _ | 200052 | 251241 | | | | | | | |
| | - | 3-% ODS | _ | | | 200057 | 200065 | | | | | | |
| 29-31 | Packing Kit Manual (| Dening Stem CK-2D | | 202100 | | 202 | 101 | | | | | | |
| 32-33 | Cap Kit, CK-2D | | 202 | 110 | 202144 | 202 | 111 | | | | | | |
| 34S, 35 | Standard Knob Kit, St (no LED) | 6A Solenoid Pilot | 205237 | | | | | | | | | | |
| | LED Knob Kit, S6A | Green | 208543 | | | | | | | | | | |
| 34L, 35 | Solenoid Pilot | Red | 208544 | | | | | | | | | | |
| 36 | Coil, S6A Solenoid Pi | lot | Refers to current price list ILP- to get the coil part number according to voltage and frequency | | | | | | | | | | |
| 37-39 | Tube Kit, Solenoid S6 | A | | | 209320 | | | | | | | | |
| 39, 40A, 41 | Plunger Seat Kit, S6A | VAC | | | 201630 | | | | | | | | |
| 39, 40D, 41 | Plunger Seat Kit, S6A | VDC | 202102 | | | | | | | | | | |
| 14(4), 15(2), 37-42 | Modular Solenoid Pilo | ot, S6A VAC | | 251138 | | | | | | | | | |

* The current Bore Plate and Adapter assemblies are not compatible with like components manufactured prior to February 2020. Because of a design change, they must be replaced as a set as they cannot be match with either component of the prior design. The current bore plate and adapter assemblies "are" compatible with valves bodies past and present.

Dimensions CK-2D Valve Dimensions



Clearance Zone:

- 1. The top of the CK-2D requires a clearance of 76 mm (3") for the removal of the disc strainer, operation of pilot regulator.
- 2. The bottom of the CK-2D valve requires a clearance of 102 mm (4") for the removal of bottom cover.
- 3. Both the left and right side of the CK-2D valve requires a minimum of 76 mm (3") on each side.

| Port Size | | | 4 | E | } * | С | ** | E | | ŀ | 1 | J | | |
|-----------|--------------------------------------|-----|------|-----|------------|-----|------|-----|------|-----|------|-----|------|--|
| mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | |
| 40 | 1-5⁄8 | 251 | 9.9 | 140 | 5.5 | 472 | 18.6 | 272 | 10.7 | 140 | 5.5 | 251 | 9.9 | |
| 50 | 2 | 251 | 9.9 | 140 | 5.5 | 472 | 18.6 | 272 | 10.7 | 140 | 5.5 | 251 | 9.9 | |
| 65 | 2 ¹ / ₂ | 252 | 9.9 | 142 | 5.6 | 500 | 19.7 | 297 | 11.7 | 159 | 6.2 | 315 | 12.4 | |
| 75 | 3 | 311 | 12.2 | 216 | 8.5 | 597 | 23.5 | 330 | 13.0 | 176 | 7.0 | 315 | 12.4 | |
| 100 | 4 | 359 | 14.1 | 219 | 8.6 | 652 | 25.7 | 361 | 14.2 | 222 | 8.9 | 363 | 14.3 | |

* Allow 25mm (1") below valve to operate manual opening stem. **Allow 38mm (1 $\frac{1}{2}$ ") above valve for removal of coil.

| | | | | Ľ |) | | | F | | | | | | | | |
|------|-------------|--|------|------|--------------------|-----|------|--|-----|------|------------|-----|------|--|--|--|
| Port | Size | FPT* | , sw | | OI | DS | | w | 'N | | DIN WN | | | | | |
| mm | inch | Connection | mm | inch | Connection | mm | inch | Connection | mm | inch | Connection | mm | inch | | | |
| 40 | 1 5/ | 1 1⁄2" | 207 | 10.1 | 21/8" | 207 | 10.1 | 1 1⁄2" | 366 | 14.4 | 38mm | 364 | 14.4 | | | |
| 40 | 1-/8 | 2" | 307 | 12.1 | 2 ⁵ /8" | 307 | 12.1 | 2" | 378 | 14.9 | 50mm | 371 | 14.6 | | | |
| 50 | 2 | 1 1⁄2" | 207 | 10.1 | 21/8" | 207 | 10.1 | 1 ¹ / ₂ " | 366 | 14.4 | 38mm | 364 | 14.4 | | | |
| 50 | 2 | 2" | 307 | 12.1 | 2 ⁵ /8" | 307 | 12.1 | 2" | 378 | 14.9 | 50mm | 371 | 14.6 | | | |
| 65 | 01/ | 2 ¹ / ₂ " | 210 | 10.5 | 2 ⁵ /8" | 210 | 10.5 | 2 ¹ / ₂ " | 389 | 15.3 | 65mm | 200 | 15.2 | | | |
| 00 | 2 72 | 3" | 310 | 12.5 | 31/8" | 310 | 12.5 | 3" | 406 | 16.0 | 0311111 | 300 | 15.5 | | | |
| 75 | 2 | 0" | 276 | 1/0 | 31/8" | 276 | 1/0 | 0" | 165 | 10.0 | 75mm | 465 | 10.2 | | | |
| 75 | 3 | 3 | 370 | 14.0 | 35/8" | 370 | 14.0 | 3 | 400 | 10.3 | 75000 | 400 | 10.3 | | | |
| 100 | 4 | 4" | 432 | 17.0 | 41/8" | 432 | 17.0 | 4" | 551 | 21.7 | 100mm | 552 | 21.7 | | | |

* FPT flanges are only available in 40 - 50mm (1-5/8" - 2")

Installation

All personnel working on valves must be qualified to work on refrigeration systems. If there are any questions contact Sporlan Division - Refrigeration Business Unit before proceeding with the installation.

All valves are packed for maximum protection. Unpack carefully, checking to make sure all items are unpacked. Save the enclosed instruction for the installer and eventual user.

 \triangle Do not remove the protective coverings from the inlet and outlet of the valve until the valve is ready to be installed.

Protect inside of valve from dirt and chips during installation.

Never install the valve with its pilot section directly beneath the main valve. The direct mounted pilot solenoid on all port size valves should be maintained above the center line on a horizontal pipe. When used on a suction or wet return line, the arrow on the valve should point in the direction of normal fluid flow. When used on either gas or liquid legs of a flooded evaporator, the arrow on the valve body should point from the evaporator to the surge drum.

The CK-2D Suction Stop Valve with S6B Pilot Solenoids may be installed on its side or vertically upright in either vertical or horizontal pipelines. The CK-2D Valves with S6A pilot solenoids may be installed on its side or vertically upright pipe line only.

If the CK-2D is replacing a S9A, or other gas powered suction stop valve of the market, the gas feed pilot solenoid must be removed of the installation and work with the solenoid pilots that CK-2D has only.

When used on a suction or wet return line, the arrow on the valve should point in the direction of normal fluid flow. When used on either gas or liquid legs of a flooded evaporator, the arrow on the valve body should point from the evaporator to the surge drum.

Before putting valves into service, all pipe connections, valve seats, bonnet seals, and stem seals should be tested for leaks at pressure levels called for in appropriate codes. In low temperature applications the CK-2D should be powered with an oil free source of gas such as that from the top of the high-pressure receiver or a rotary screw compressor system. The CK-2D should not be used at temperatures below -32°C (-25°F) if an oil free source of high-pressure gas cannot be utilized to power the valve.

Manual Opening Operation

All valves contain a manual lift stem. If it is desired to hold open the CK-2D manually, remove Bottom Sealing Cap and turn the Lifting Stem inward as far as possible. The valve cannot close now until the Seat Lift Stem is once again turned out.



| | Maximum Stem Turns Required to Manually Open Valve | | | | | | | | | | | | | | |
|----------|---|----------|--------------------------|-------|-------|-------------|--|--|--|--|--|--|--|--|--|
| Port | Size | Normolly | Manual Opening | 'A' N | /lax. | Approximate | | | | | | | | | |
| mm | Inch | Normany | Stem Position to Open | mm | Inch | Stem Turns | | | | | | | | | |
| CI | K-2D | DUAL GAS | POWERED SU | огто | N ST | OP VALVE | | | | | | | | | |
| 40 50 | 1⁵% 2 | Opened | IN | 27.9 | 1.1 | 12 | | | | | | | | | |
| 65 | 2½ | Opened | IN | 33.0 | 1.3 | 14 | | | | | | | | | |
| 75 | 3 | Opened | IN | 50.8 | 2.0 | 17.5 | | | | | | | | | |
| 100 | 4 | Opened | IN | 43.2 | 1.7 | 17 | | | | | | | | | |

Service Pointers

- 1. Failure to close:
 - (a) One, or both pilot solenoids are not operating due to low voltage or solenoid coil burnout.
 - (b) Dirt lodged between one of the valve pistons and the cylinder wall (disassemble and remove all dirt and burrs).
 - (c) Manual lift stem is turned in, thereby mechanically holding the pistons in the open position.
 - (d) Strainer/Disc in the Pilot line Flanges may be plugged (Remove and clean).
 - (e) Pilot pressure source is not high enough; must be at least 0.35 bar (5 psi) above the main valve downstream pressure.
 - (f) Solenoid coils are not being energized in the proper sequence.

- 2. Failure to open:
 - (a) Dirt lodged between the valve pistons and the cylinder walls (Disassemble and remove dirt and burrs).
 - (b) Main valve spring may be broken (replace spring).
 - (c) Pressures between remote pressure source and main valve downstream pressures are not equalizing. Check for leakage through the pilot solenoids. Check for backward installation of the CK-2D preventing the equalization with downstream pressure.
 - (d) Viscous oil can prevent the valve from opening.
- 3. Leakage through valve when closed:
 - (a) There are dirt or chips under the main valve piston. Disassemble valve and clean thoroughly.
 - (b) Damage to piston plug seat surface or body seat. Replace entire valve piston and lap grind piston face into valve and seat bead if necessary.

| Port | Size | Dolt Cine | Hom Description | Tor | que |
|---|---|-------------------------------------|---|-------|-------|
| mm | inch | Boit Size | tem Description | N m | ft lb |
| 40 - 65 | 1 ⁵ / ₈ - 2-1/ ₂ | ³ / ₈ " - 16 | Cover - Adapter Screws | 20.3 | 30 |
| 75 - 100 | 3 - 4 | ⁵⁄8" - 11 | Cover - Adapter Screws | 101.7 | 75 |
| 40 - 65 | 1 ⁵ / ₈ - 2-1/ ₂ | ⁵ / ₁₆ " - 18 | Bore Plate Screws | 20.3 | 15 |
| 40 - 100 | 1 % - 4 | 1⁄4" - 20 | S6B or S6A Screws | 10.9 | 8 |
| | | _ | Tube Assembly with Aluminum Gasket - Solenoid Pilot S6A | 149.6 | 110 |
| 40 - 100 | 1 ½ - 4 | _ | Tube Assembly with Wolverine Gasket - Solenoid Pilot S6A | 81.6 | 60 |
| | | — | Tube Assembly - Solenoid Pilot S6B | 20.4 | 15 |
| 10, 13 or 20 | 3%, 1⁄2 or 3⁄4 | ⁷ / ₁₆ " - 14 | Flange Bolt for Disc Strainer | 38.0 | 28 |
| 40 - 50 | 15 - 2 | ⁵⁄∗" - 11 | Flange Bolt | 24.3 | 85 |
| 65 - 75 | 2 1⁄2 - 3 | ³ ⁄4" - 10 | Flange Bolt | 142.4 | 105 |
| 100 4 ⁷ / ₈ " - 9 | | | Flange Bolt | 203.4 | 150 |

CK-2D Bolt Torque Recommendations

| | | | | | | | | | | | | | | | | |
|---|---|--|---|---|---|---|--|--|--|------|------|--|------|------|--|---|
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Safe Operation (See 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 increases 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 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.

Warranty

All Refrigerating Specialties products are under warranty against defects 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 the 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 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 including any warranty of merchantability, or fitness for a particular purpose. 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.

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The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors. To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

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Dual Gas Powered Suction Stop Valve

Product Bulletin 50-25 E

Type: CK-6D

Purpose:

The CK-6D from Parker is an economical solution to evaporator equalization following a defrost cycle. Combining equalizing and suction stop functions reduces installation costs.

This valve incorporates a pressure pilot, built-in mechanical failsafe feature which prevents the undesirable effects of an immediate opening of the valve in the event of an electrical power failure while the evaporator is in defrost.

CK-6D is typically used for low temperature applications in overfeed or flooded systems, in wet return lines, and on the liquid and gas return legs of flooded evaporators.

Contact Information:

Parker Hannifin Corporation **Sporlan Division – Refrigeration Business Uni**t 2445 South 25th. Avenue Broadview, IL 60155-3891

phone (708) 681-6300 fax (708) 681-6306

www.parker.com/rs rsd_orders@parker.com



Product Features:

- Suitable for Ammonia, R-22, R-134a, R-404A, R-410A, R-507, and Other Common Refrigerants
- Economical Solution to Evaporator Equalization after Defrost
- Normally Open
- Low Pressure Drop
- Manual Opening Stem

- Port Sizes: 40 to 100 mm (1-5/8 to 4")
- Use in Vertical or Horizontal Lines
- Temperature Range: -51 to 104°C (-60 to 220°F)
- Maximum Rated Pressure (MRP): 28 barg (406 psig)
- Heavy Return Spring
- Minimum Pressure Drop to Close: 0.35 bar (5 psi)





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Technical Data

| Body Material Ductile Iron |
|--|
| Seat Material Ductile Iron |
| Refrigerant Temperature Range*51 to 104°C (-60 to 220°F) |
| Ambient Temperature Range: |
| AC Coils |
| DC Coils25 to 60°C (-13 to 140°F) |
| Maximum Rated Pressure (MRP) |

Description

The CK-6D is based on the same valve body, principles, and length dimension as the standard CK-5 valves making for easy field replacements. This heavy duty gas-powered valve is suitable for ammonia, R-22, and other refrigerants, certain oils and other fluids approved for use in refrigeration. The CK-6D is a pilot operated, dual-position valve. This valve is equipped with a manual opening stem and A2D pressure pilot.

These valves are piston-type, gas powered, and normally open. They are heavy duty, semi-steel bodied valves that are built with control precision. The CK-6D is a normally open valve and will open remain open if open on power failure or open to it's intermediate position if closed on power failure and the inlet pressure exceeds the set point.

The Type CK-6D Gas-Powered Valve is furnished with FPT Internal NPT (U.S. Standard Taper Pipe Thread), Socket Weld, Weld Neck or ODS (solders over copper piping of given diameter) connections. The valve may be easily removed from between the flanges for servicing.

Purpose & Applications

These valves are employed as low pressure drop, gas-powered suction stop valves for low temperature evaporators.

| Replacement Part Kits | Э |
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| Dimensions | 1 |
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| Minimum Pressure to Open | 0 bar (0 psig) |
|---|-------------------|
| Minimum Pressure above, Inlet Pressure to | Close Valve |
| | 0.35 bar (5 psig) |
| | |
| | |

* Recommended application temperature above -32°C (-25°F). Contact factory for proper selection assistance, if required.

Because of the return spring, there is no line pressure drop required to open the valve during refrigeration. This allows for a minimal pressure drop penalty in the suction line. The CK-6D will positively close the suction line allowing for defrost to occur. The dual position feature permits the evaporator pressure to equalize with the suction pressure after a defrost cycle has occurred. The intermediate stage allows for this equalization to occur in a controlled manner without the need for an externally piped equalizing solenoid.

The CK-6D is a unique control valve that also incorporates a built-in mechanical fail-safe feature which prevents the undesirable effects of an immediate opening of the valve in the event of an electrical power failure while the evaporator is in defrost.

This valve is designed for a positive closing of the suction line, liquid overfeed, flooded evaporator gas return lines during defrosting in low temperature applications. Due to it is a gas power suction stop valve that closes, the valve can operate even under oil conditions. Recommendations assume no highly viscous oil, dirt, moisture or foreign substance in refrigerant; also no abnormal shock impact below -32° C (-25° F).

| | CK-6D Valve General Information | | | | | | | | | | | | | | | | |
|-----|---------------------------------|------|---------|----------------------|----------|--------|---------------------------------------|-------------------------|-------------------|--------|--------|--------------|-----|--|--|--|--|
| Po | ort | FI | ow | | Connec | ctions | | | | | Weight | | | | | | |
| Si | ze | Coef | ficient | FPT ^[1] , | SW, WN | 0 | DS | Pilot Solenoid | Pressure Pilot | With F | langes | Less Flanges | | | | | |
| mm | inch | Kv | Cv | mm | inch | mm | inch | Colenoid | 1 not | Kg | Lbs | Kg | Lbs | | | | |
| 40 | 1 ⁵ ⁄8 | 32 | 37 | 38*,50 | 11⁄2*, 2 | 54*,66 | 21/8*,25/8 | S6B ^[2] /S6A | A2DK/A2D | 28 | 62 | 25 | 55 | | | | |
| 50 | 2 | 44 | 51 | 40,50* | 1½, 2* | 54*,66 | 21/8*,25/8 | S6B ^[2] /S6A | A2DK/A2D | 28 | 62 | 25 | 55 | | | | |
| 65 | 21⁄2 | 70 | 82 | 65*,80 | 21⁄2*, 3 | 66*,80 | 2 ⁵ /8* ,3 ¹ /8 | S6B ^[2] /S6A | A2DK/A2D | 36 | 79 | 34 | 75 | | | | |
| 75 | 3 | 103 | 120 | 75 | 3 | 80*,92 | 31/8* ,35% | S6B ^[2] /S6A | A2DK/A2D | 50 | 110 | 47 | 104 | | | | |
| 100 | 4 | 171 | 200 | 100 | 4 | 105 | 4 ¹ / ₈ | S6A | A2DK/A2D | 74 | 163 | 71 | 157 | | | | |

*Standard Connection.

1. FPT Flanges are only available in sizes: 32 to 50 mm (1-1/4 to 2").

2. Valves containing S6B coils can be installed in a vertical or horizontal position.



Principle of Operation

The CK-6D is a normally open valve which uses discharge gas to power the valve closed. For closing of the CK-6D, either energize both solenoid coils simultaneously, or energize solenoid coil #2 initially allowing condenser gas pressure or pressure from another source to act on the secondary piston forcing it down and closing the valve to the 1st stage. Then while keeping solenoid coil #2 energized, solenoid coil #1 is energized allowing gas pressure to act on the primary piston forcing it down, compressing the spring fully, and firmly seating on the valve seat bead.

Sporlan Division - Refrigeration Business Unit recommends utilizing an oil free source of gas such as that from the top of the high-pressure receiver, or rotary screw compressor system. The valve will not close unless pressure above the pistons exceeds the downstream pressure by at least 0.35 bar (5 psi). If an attempt is made to fully close the valve by only energizing solenoid coil #1, a far greater amount of pressure will be required to act upon the main piston.

For line equalization solenoid coil #1 is de-energized, while solenoid coil #2 remains energized, allowing the primary piston to move up to the bottom of the secondary piston, allowing for evaporator equalization after defrost. The length of time the valve is left in the equalization position is controlled by the time set in the equalization stage on the defrost controller.

After the termination of the hot gas injection period, any style of suction stop valve must reopen in order for refrigeration to resume. For the CK-6D to open, the valve's pilot solenoids de-energize, thereby interrupting the pilot stream flow of discharge gas to the top of the valve's pistons. The main valve will open to it's intermediate position, however, since residual pressure in the coil is transmitted through the pilot regulator to the top of the top piston. (See Figure 1 and 2). **NOTE:** The pilot regulator should keep or maintain a minimal set point, approximately 0.69 barg (10 psig) above the pressure of the defrost relief or equalizing line, otherwise the valve will not open.

De-energizing only the solenoid feeding the lower piston will allow some flow to pass and equalize pressures between the coil and the suction line. It is imperative to allow sufficient time for this equalization. The ability of the CK-6D to resist opening fully during an interruption of power, while an evaporator is in the process of defrosting, is its single greatest advantage. Where power failures can occur with any frequency, consideration should be given to this unique valve. By design, a standard CK-2 or a competitive valve of similar design would open immediately as residual coil pressure surges through the valve should power to the pilot solenoid suddenly be interrupted during a defrost. The design of the CK-6D prevents this from occurring and prevents the dangerous consequences to the system under these conditions. In the event the CK-6D pilot solenoid de-energizes due to a power failure while the evaporator is in defrost, the defrost coil pressure (typically at or about 4.8 barg (70 psig) for ammonia) will continue to be transmitted through passage "N", through the pilot regulator and to the top of the piston. This pilot pressure acts as a "closing" force acting upon the larger effective area of the top of the piston, and will overcome the "opening" force of coil pressure working against the underside of the piston. The valve will therefore remain closed due to the greater closing force until the coil pressure is equalized through the piston bleed hole.

If the defrost relief line is connected to an intermedia pressure/temperature line (higher than the suction line of the particular application), the pressure setting of pressure pilot of the CK-6D needs to be 0.69 barg (10 psig) above the pressure of the defrost relief or equalizing line, otherwise the valve will not open.

| | CK-6D Function | | | | | | | | | | | | |
|------|----------------|---|--|--|--|--|--|--|--|--|--|--|--|
| Coil | Action | Function | | | | | | | | | | | |
| #1 | De-energized | Full Open | | | | | | | | | | | |
| #2 | De-energized | (Normal Operation During Refrigeration) | | | | | | | | | | | |
| #1 | Energized | Full Close | | | | | | | | | | | |
| #2 | Energized | (Defrost) | | | | | | | | | | | |
| #1 | De-energized | Equalization | | | | | | | | | | | |
| #2 | Energized | Equalization | | | | | | | | | | | |

Top View



NOTE: The valve stays in equalize position if inlet pressure exceeds pilot body setting.

SEQUENCE TO CLOSE: First Energize Coil #2 and then Coil #1. This way you avoid bypass gas and close the valve.

Electrical

The pilot solenoids used on CK-6D stop valves, type S6A or S6B, are unique to the Sporlan Division - Refrigeration Business Unit line of control valves. The coils are designed for long life and powerful opening force. The standard coil housing meets special requirements, this sealed construction can withstand direct contact with moisture and ice. For class "H" coil construction will permit coil temperatures, as measured by resistance method, as high as 180°C (356°F). By definition, class "F" coil construction will permit coil temperatures, as measured by resistance method, as high as 180°C (356°F). By definition, class "F" coil construction will permit coil temperatures, as measured by resistance method, as high as 155°C (311°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. A solenoid coil should never be energized except when mounted on its corresponding solenoid tube.

The solenoid coil must be connected to an electrical line with Volts and Hertz the same as stamped on the 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 coil voltage above or below these limits may result in coil burnout. Also, operating with a coil voltage below the limit will definitely result in lowering the valve's maximum opening pressure differential.

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CK-6D General Coil Information

| S6B Coils | | | | | | | | | | | |
|--------------------|---------------|-----------------|-----------------------------|------------------------------|------------------------|------------------|--|--|--|--|--|
| Coil (Volts/Hz) | Power Lead | Neutral Lead | Inrush Current (Amps) | Running Current (Amps) | Fuse Size (Amps) | Temp °C (°F) | | | | | |
| 110-120 /50-60 | Black | Green | 0.66 | 0.42 | 1 | | | | | | |
| 208/50 | Black | Green | 0.35 | 0.22 | 1 | 180°C (356°F) | | | | | |
| 220-240 /50-60 | Black | Green | 0.33 | 0.21 | 1 | | | | | | |

| | S6A Coils | | | | | | | | | | | |
|--------------------|---------------|-----------------|-----------------------------|------------------------------|------------------------|-----------------|--|--|--|--|--|--|
| Coil (Volts/Hz) | Power Lead | Neutral Lead | Inrush Current (Amps) | Running Current (Amps) | Fuse Size (Amps) | Temp °C (°F) | | | | | | |
| 24/50 | Brown | White | 6.82 | 2.99 | 4 | 250 (482) | | | | | | |
| 24/60 | Brown | White | 6.70 | 2.73 | 4 | 250 (482) | | | | | | |
| 48/50 | Brown | White | - | 1.07 | - | 250 (482) | | | | | | |
| 115/50 | Purple | White | 1.22 | 0.21 | 1 | 90 (194) | | | | | | |
| 120/60 | Blue | White | 1.18 | 0.46 | 1 | 90 (194) | | | | | | |
| 208/60 | Red | White | 0.63 | 0.24 | 1 | 90 (194) | | | | | | |
| 230/50 | Yellow | White | 0.65 | 0.26 | 1 | 90 (194) | | | | | | |
| 240/50 | Black | White | 0.59 | 0.24 | 1 | 90 (194) | | | | | | |
| 240/60 | Orange | White | 0.60 | 0.23 | 1 | 98 (208) | | | | | | |
| 12 DC | Brown | White | - | - | - | - | | | | | | |
| 24 DC | Brown | White | 6.70 | 6.70 | - | 204 (400) | | | | | | |
| 48 DC | Brown | White | _ | - | - | - | | | | | | |

Notes:

Leaded coils are provided with 18 gauge wires at 914 mm (36") in length.

CK-6D General Coil Information

| Pilot | Туре | Image | Terminal Diagram | Classification | Voltages/ Frequencies | Wattage (Holding) | Certifications |
|-------|--------|---|--|--|--|--|--------------------------------|
| _ | Leaded | | Start Winding: White Wire End Winding: Black Wire | Class "F" approved system with housing meeting 3R and 4 requirements 18" Leaded Wires NEMA 3R and 4 | 24 VAC/50 Hz 24 VAC/60 Hz 115 VAC/50 Hz 120 VAC/60 Hz 208 VAC/60 Hz 230 VAC/50 Hz 240 VAC/50 Hz 240 VAC/60 Hz 12 VDC ^[1] 24 VDC ^[1] | - 34.0 32.5 32.5 35.0 37.5 - 32 | CSA UL 🛛 |
| S6A | | Crowna Carolina Carol | | Class "F" approved system with housing meeting 3R and 4 requirements NEMA 3R and 4 IP65 | 24 VAC/50 Hz 48 VAC/50 Hz 115 VAC/50 Hz 230 VAC/50 Hz 240 VAC/50 Hz | - 42.5 N/A 34.5 30.0 | CSA CE UL ^[2] |
| | | | Ground | Class "F" approved system with housing meeting 3R and 4 requirements NEMA 3R and 4 | 24 VAC/60 Hz 120 VAC/60 Hz 240 VAC/60 Hz 24 VDC ^[1] 48 VDC ^[1] | 35.5 37.5 32.0 42.5 | CSA UL ^[2] |
| S6B | Leaded | | Start Winding: White Wire End Winding: Black Wire | Standard Molded Class "H" #18 AWG 18" Leaded Wires NEMA 3R and 4 | 110/120 VAC 50/60 Hz 208 VAC 60 Hz 220-240 VAC 50/60 Hz | 18.5 W | CE |

Notes:

- Consult factory for other voltages/frequencies.

- See current price list ILP- for coil part numbers.

- Optional LED pilot light knob kit (green or red) that indicates when the coil is energized. LED knob kits can be used with 115 to 240 Volts AC coils only.

[1] DC coils are limited to an ambient temperature of -25°C to 60°C (-13°F to 140°F).

[2] Only on approved coils.

Explosion View & Material List



CK-6D Material List

| Item | Description | Material | Qty |
|------|--|---------------------------------------|-----|
| 1 | Seal Cap, A2D | Aluminum 2011-T3 | 1 |
| 2 | Gasket, Seal Cap, A2D | Nylon | 1 |
| 3 | Nut, Packing, A2D | 303 S.S. | 1 |
| 4 | Packing, Stem, A2D | Crane Foil | 1 |
| 5 | Washer, Packing, A2D | Teflon, Carbon | 1 |
| 6 | Stem, Pressure Pilot, A2D | 303 S.S. | 1 |
| 7 | Bonnet, A2D | Cast Iron | 1 |
| 8 | Screw, Pressure Pilot, A2D | Steel Grade 5 Zinc | 8 |
| 9 | Plate, Spring, Upper, A2D | Carbon Steel | 1 |
| 10 | Spring, Range A, A2D | ASTM A401 | 1 |
| 11 | Plate, Spring, Lower, A2D | Carbon Steel | 1 |
| 12 | Follower, Diaphragm, A2D | Carbon Steel | 1 |
| 13 | Gasket, Diaphragm, A2D | Garlock 2930 Non-asbestos | 1 |
| 14 | Diaphragm, A2D | Stainless Steel | 1 |
| 15 | Seat, A2D | 303SS ASTM A582 | 1 |
| 16 | Gasket, Bonnet, A2D | Garlock 2930 Non-asbestos | 1 |
| 17 | Body base, A2D | Cast Iron | 1 |
| 18 | Bolt, A2D HEX HD ¼" - 20 x 1-¼" L | Steel Grade 5 Zinc | 4 |
| 19 | O-ring, A2D, S6A & S6B | Neoprene | 6 |
| 20 | Bolt, Disc Strainer ⁷ /16" - 14 x 2- 1/2" L | Steel Grade 5 Zinc | 2 |
| 21 | Flange, Disc Strainer | ASTM A-105 | 2 |
| 22 | Gasket, Disc Strainer | Garlock 2930 Non-asbestos | 2 |
| 23 | Strainer, Disc, 60 mesh | Carbon 1213/1215 | 1 |
| 24 | Nut, Disc Strainer | 416 SS | 2 |
| 25 | Pipe, Nipple ³ /8" x 2L, Disc Strainer | 1117 Steel | 1 |
| | Screw, Cover - Adapter, CK-6D, Body 40 to 50 mm (1- ⁵ % to 2") ³ %" - 16 X 2- ¹ / ₄ " L | | |
| 26 | Body 65 mm (2-½") ³ /s" - 16 X 2- ½" L Screw, Cover - Adapter, CK-6D, Body 75 mm (3") ⁵ /s" - 11 X 4- ½" L | Steel Grade 5 Zinc | 6 |
| | Screw, Cover - Adapter, CK-6D, Body 100 mm (4") ⁵ ∕8" - 11 X 5 L | | |
| 26A | Screw, Bore Plate, CK-6D, Body 40 to 65 mm (1- ⁵ ⁄8 to 2-½") ⁵ ⁄16" - 18 X 1- ¼" L | Steel Grade 5 Zinc | 8 |
| 27 | Name Plate, CK-6D | Aluminum | 1 |
| 28 | Bolt, Name Plate, CK-6D | Stl. Zinc Plated | 2 |
| 29 | Adapter, CK-6D | Cast Iron GGG 40.3 | 1 |
| 30 | Gasket, Adapter/Cover, CK-6D | Garlock 2930 Non-asbestos | 1 |
| 31 | Piston, Top, CK-6D | 1215 CRS or 1117 Steel and 1018 CR | 1 |
| 32 | Bore Plate, CK-6D | Cast Iron GGG 40.3 | 1 |
| 33 | Gasket, Body, CK-6D | Garlock 2930 Non-asbestos | 1 |
| 34 | Piston Plug, CK-6D | Ductile Iron per ASTM A-536 | 1 |
| 35 | Spring, Manual Opening, CK-6D | ASTM A229 | 1 |
| 36 | Stem, Manual Opening, CK-6D | 416 SS | 1 |
| 37 | Body CK-6D | Ductile Iron per DIN GGG 40.3 | 1 |

| Item | Description | Material | Qty |
|------|--|-------------------------------|-----|
| | Nut Flange, CK-6D Body 40 to 50 mm (1- ⁵ ⁄k to 2") ⁵ ⁄k" - 11 | | |
| 38 | Nut Flange, CK-6D Body 65 to 75 mm (2-½ to 3") ¾" - 10 | Steel | 8 |
| | Nut Flange, CK-6D Body 100 mm (4") ⁷ / ₈ " - 9 | | |
| 39 | Gasket, Flange, CK-6D | Garlock 2930 Non-asbestos | 2 |
| 40 | Male Flange, CK-6D Body 40 to 100 mm (1-½ to 4") | ASTM A-105 | 2 |
| | Bolt Flange, CK-6D Body, 40 to 50 mm (1-5⁄k to 2") BLT, SQ HD 5⁄k" - 11X 3-1⁄4"L | | |
| 41 | Bolt Flange, CK-6D Body, 65 to 75 mm (2-½ to 3") BLT, SQ HD ¾" - 10 X 3-¾"L | ASTM A 307 GR A ZINC | 8 |
| | Bolt Flange, CK-6D Body, 100 mm (4") BLT, SQ HD ⁷ /8"- 9 X 4-½"L | | |
| 42 | Washer, Flat, CK-6D | Soft AISI 1010 Carbon Steel | 1 |
| 43 | Packing, Stem, CK-6D | ASTM F2168 | 1 |
| 44 | Nut, Packing, CK-6D | 416 SS | 1 |
| 45 | Gasket, Seal Cap Bottom, CK-6D | Nylon | 1 |
| 46 | Seal Cap, CK-6D | Aluminum 2011-T3 | 1 |
| 47 | Clip Retainer for S6B Coil Solenoid Pilot | Spring Steel | 1 |
| 48 | Coil for S6B Solenoid Pilot | Standard Molded Class H | 1 |
| 49 | Body, S6B Solenoid Pilot | AISI 1214 steel | 1 |
| 50 | Bolt, S6A/S6B Solenoid Pilot HEX HD ¼" - 20 x 2-¼" L | Steel Grade 5 Zinc | 8 |
| 51L | LED Knob Kit, S6A Coil, Solenoid Pilot | - | 1 |
| 51S | Standard Knob Kit, S6A Coil, Solenoid Pilot | - | 1 |
| 52 | O-ring, S6A Coil Solenoid Pilot | Ethylene Propylene | 1 |
| 53 | Coil for S6A Solenoid Pilot | Encapsulated | 1 |
| 54 | Nut, Solenoid Tube, S6A Solenoid Pilot | Steel AISI 1010 or AISI 12L14 | 1 |
| 55 | Solenoid Tube S6A, VAC Coil, Solenoid Pilot | 304 S.S. | 1 |
| 56 | Gasket, Tube S6A, Solenoid Pilot | Wolverine | 2 |
| 57A | Plunger/Needle Assembly S6A, VAC Coil | Silicon Iron B Steel | 1 |
| 57D | Plunger/Needle Assembly S6A, VDC Coil | Silicon Iron B Steel | 1 |
| 58 | Seat Assembly, S6A Solenoid Pilot | 416 S.S. ASTM A484 | 1 |
| 59 | Body, S6A Solenoid Pilot | ASTM A536 | 1 |

CK-6D Replacement Part Kits

| | | | | | Port Size | | | |
|---------------------------|----------------------------------|---------------------|------------------|---------------|-------------------------------|---------------|----------------|--|
| Item | Kit Desc | ription | 40 mm (1⁵⁄₃") | 50 mm (2") | 65 mm (2 ¹ ⁄2") | 75 mm (3") | 100 mm (4") | |
| 1, 2 | Seal Cap Kit, Pressure | Pilot A2D | | | 202110 | | | |
| 2 (12) | Gasket Pkg, Seal Cap | Pressure Pilot | | | 202408 | | | |
| 3-5 | Packing Kit, Stem Pres | sure Pilot | | | 202100 | | | |
| 4 (25) | Stem Packing, Pkg. Pre | essure Pilot | | | 202478 | | | |
| 4-6 | Stem Kit, Pressure Pilo | t A2D | | | 202120 | | | |
| 8 (8) | Bolt Pkg. Kit, Bonnet P | ressure Pilot A2D | | | 202246 | | | |
| 3-6, 9-12 | Spring/Stem Kit, Range | e A, Pressure Pilot | | | 202006 | | | |
| 9-11, 13 | Spring Kit, Range A, Pr | ressure Pilot | | | 202481 | | | |
| 13, 14, 16 | Diaphragm Kit, Pressur | re Pilot A2D | | | 200770 | | | |
| 13-16 | Seat/Diaphragm Kit, Pr | ressure Pilot | | | 202001 | | | |
| 18 (4), 19 (2) | Bolt/O-ring Kit, Pressu | re Pilot A2D | | | 201572 | | | |
| 19 (12) | O-ring Pkg, Pressure P | ilot | | | 202424 | | | |
| 1-19 | Complete Modular Pres Range A | ssure Pilot A2D, | | | 201675 | | | |
| 19 (2), 50 (4) | Bolt/O-ring Kit, S6A or | S6B Solenoid Pilot | | | 201574 | | | |
| 20 (2), 24 (2) | Bolts and Nuts, for Dise | c Strainer | 201580 | | | | | |
| 22 (2), 23 | Strainer Kit, Disc | | | | 200912 | | | |
| | | 10mm (%") FPT | | | 201665 | | | |
| | Strainer Kit Disc with | 10mm (¾") SW | | | 201704 | | | |
| 20-25 | Flanges, Bolts, Nuts, | 13mm (½") FPT | | | 201706 | | | |
| | and Gaskets | 13mm (½") SW | 201707 | | | | | |
| | | 20mm (¾") SW | 201710 | | | | | |
| 26 (6), 29-33 | Adapter/Bore Plate Kit, | CK-6D | 251 | 004* | 251010* | 251016* | 251022* | |
| 33-34 | Piston Plug Kit, CK-6D | | 209172 | 209173 | 209174 | 209175 | 209176 | |
| 35 | Spring Kit, CK-6D | | 301 | 490 | 301494 | 301505 | 301500 | |
| 36, 42-44 | Stem Kit, CK-6D | | 201 | 133 | 201118 | 201216 | 251123 | |
| 38 (4), 39 (1), 41 (4) | Union Kit per Flange Cł | <-6D | 206 | 516 | 206217 | 206218 | 206219 | |
| 38 (8), 41(8) | Bolts and Nuts Pkg. Fla Valve | inges per CK-6D | 201 | 604 | 201 | 614 | 206052 | |
| 39 (12) | Gasket Kit, Flange CK-6 | 6D | 202 | 081 | 202082 | 202083 | 202084 | |
| | | FPT | 200039 | 200040 | - | _ | _ | |
| | | SW | 200041 | 200042 | 200049 | 200054 | 200063 | |
| | | WN | 200043 | 200044 | 200050 | 200055 | 200064 | |
| | Flange, CK-6D | 2-1/8 ODS | 200 | 046 | _ | _ | _ | |
| 40 (2) | Body | 2-⁵% ODS | 200 | 047 | 200051 | _ | _ | |
| | - | 3-1% ODS | _ | _ | 200052 | 251241 | _ | |
| | | 3-5⁄8 ODS | _ | _ | l – | 200057 | — | |
| | | 4-1% ODS | _ | _ | <u> </u> | _ | 200065 | |
| 42-44 | Packing Kit, Manual Op | ening Stem CK-6D | | 202100 | | 202 | 2101 | |
| 45-46 | Cap Kit, CK-6D | | 202110 | 202 | 2144 | 202 | 2111 | |

* The current Bore Plate and Adapter assemblies are not compatible with like components manufactured prior to February 2020. Because of a design change, they must be replaced as a set as they cannot be match with either component of the prior design. The current bore plate and adapter assemblies "are" compatible with valves bodies past and present.

CK-6D Replacement Part Kits (Cont.)

| | | | Port Size | | | | | | |
|--------------------------|----------------------------------|-------------------|--|---------------|-------------------------------|---------------|----------------|--|--|
| Item | Kit Des | scription | 40 mm (1⁵⁄8") | 50 mm (2") | 65 mm (2 ¹ ⁄2") | 75 mm (3") | 100 mm (4") | | |
| 47 (12) | Clip Retainer for S6B | Coil, Kit | 206516 | | | | | | |
| 48 | Coil, S6B, Solenoid F | Pilot | Refers to current price list ILP- to get the coil part number according to voltage and frequency | | | | | | |
| 19 (2), 49, 50 (4) | Modular Solenoid Pilo | ot, S6B | | | 205073 | | | | |
| 51S, 52 | Standard Knob Kit, S (no LED) | 6A Solenoid Pilot | 205237 | | | | | | |
| E11 E0 | LED Knob Kit, S6A | Green | 208543 | | | | | | |
| 51L, 52 | Solenoid Pilot | Red | 208544 | | | | | | |
| 52 | Coil S6A Solonoid Pi | ilet | Refers to current price list ILP- to get the coil part number according to | | | | | | |
| | Coll, SOA Solenold Fi | liot | voltage and frequency | | | | | | |
| 54-56 | Tube Kit, Solenoid S6 | A | | | 209320 | | | | |
| 56, 57A, 58 | Plunger Seat Kit, S6A | VAC | 201630 | | | | | | |
| 56, 57D, 58 | Plunger Seat Kit, S6A | VDC | 202102 | | | | | | |
| 19 (2), 50 (4), 54-59 | Modular Solenoid Pilo | ot, S6A VAC | | | 251138 | | | | |

Dimensions CK-6D Valve Dimensions



Clearance Zone:

- 1. The top of the CK-6D requires a clearance of 76 mm (3") for the removal of the disc strainer, operation of pilot regulator.
- 2. The bottom of the CK-6D valve requires a clearance of 102 mm (4") for the removal of bottom cover.
- 3. Both the left and right side of the CK-6D valve requires a minimum of 76 mm (3") on each side.

| Port | Size | ļ | ٩ | E | 3* | С | ** | l | E | H | ł | | J | ł | ٢ | l | - |
|------|-------------------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|
| mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch |
| 40 | 1-5⁄8 | 251 | 9.9 | 140 | 5.5 | 472 | 18.6 | 272 | 10.7 | 140 | 5.5 | 251 | 9.9 | 500 | 19.7 | 117 | 4.6 |
| 50 | 2 | 251 | 9.9 | 140 | 5.5 | 472 | 18.6 | 272 | 10.7 | 140 | 5.5 | 251 | 9.9 | 500 | 19.7 | 117 | 4.6 |
| 65 | 2 ¹ /2 | 252 | 9.9 | 142 | 5.6 | 500 | 19.7 | 297 | 11.7 | 159 | 6.2 | 315 | 12.4 | 528 | 20.8 | 124 | 4.9 |
| 75 | 3 | 311 | 12.2 | 216 | 8.5 | 597 | 23.5 | 330 | 13.0 | 176 | 7.0 | 315 | 12.4 | 625 | 24.6 | 142 | 5.6 |
| 100 | 4 | 359 | 14.3 | 219 | 8.6 | 652 | 25.7 | 361 | 14.2 | 222 | 8.9 | 363 | 14.3 | 681 | 26.8 | 158 | 6.2 |

* Allow 25mm (1") below valve to operate manual opening stem.

**Allow 38mm (11/2") above valve for removal of coil.

| Devit | Cine . | D | | | | | | F | | | | | |
|-------------|-------------|--|----------|-------|---------------------------|----------|------|--|------|------|------------|------|------|
| F 01 (5120 | | FPT*, SW | | | | ODS | | WN | | | DIN WN | | |
| mm | inch | Connection | mm | inch | Connection | mm | inch | Connection | mm | inch | Connection | mm | inch |
| 40 | → 5/ | 1 ¹ / ₂ " | 207 | 10.1 | 21/8" | 207 | 10.1 | 1 ¹ / ₂ " | 366 | 14.4 | 38mm | 364 | 14.4 |
| 40 | 1-/8 | 2" | 307 | 12.1 | 2 ⁵ /8" | 307 12.1 | 2" | 378 | 14.9 | 50mm | 371 | 14.6 | |
| 50 | | 1 ¹ / ₂ " | 0.07 | 10.1 | 2 ¹ /8" | 0.07 | 10.1 | 1 ¹ / ₂ " | 366 | 14.4 | 38mm | 364 | 14.4 |
| 50 | 2 | 2" | 307 12.1 | 25/8" | 307 | 307 12.1 | 2" | 378 | 14.9 | 50mm | 371 | 14.6 | |
| 6F | 01/ | 2 ¹ / ₂ " | 010 | 10.5 | 25/8" | 210 | 10.5 | 2 ¹ / ₂ " | 389 | 15.3 | GEmm | | 15.0 |
| 60 | 2./2 | 3" | 310 | 12.5 | 3 ¹ /8" | 310 | 12.5 | 3" | 406 | 16.0 | | 300 | 15.3 |
| 75 | 2 | 0" | 076 | 14.0 | 31/8" | 076 | 14.0 | 0" | 465 | 10.0 | 75.000 | 465 | 10.0 |
| 75 | 3 | 3 | 376 | 14.8 | 35/8" | 376 | 14.8 | 3 | 465 | 18.3 | / smm | 465 | 18.3 |
| 100 | 4 | 4" | 432 | 17.0 | 4 ¹ /8" | 432 | 17.0 | 4" | 551 | 21.7 | 100mm | 552 | 21.7 |

* FPT flanges are only available in 40 - 50mm (1-5%" - 2")

Installation

All personnel working on valves must be qualified to work on refrigeration systems. If there are any questions contact Sporlan Division - Refrigeration Business Unit before proceeding with the installation.

All valves are packed for maximum protection. Unpack carefully, checking to make sure all items are unpacked. Save the enclosed instruction for the installer and eventual user.

 \triangle Do not remove the protective coverings from the inlet and outlet of the valve until the valve is ready to be installed.

Protect inside of valve from dirt and chips during installation.

Never install the valve with its pilot section directly beneath the main valve. The direct mounted pilot solenoid on the 40mm through 100mm (1-%" through 4") port size valves should be maintained above the center line on a horizontal pipe. When used on a suction or wet return line, the arrow on the valve should point in the direction of normal fluid flow. When used on either gas or liquid legs of a flooded evaporator, the arrow on the valve body should point from the evaporator to the surge drum.

The CK-6D Suction Stop Valve with S6B Pilot Solenoids may be installed on its side or vertically upright in either vertical or horizontal pipelines. The CK-6D Valves with S6A pilot solenoids may be installed on its side or vertically upright pipe line only.

If the CK-6D is replacing a CK-2, S9A, or other gas powered suction stop valve of the market, the gas feed pilot solenoid must be removed of the installation and work with the solenoid pilots that CK-6D has only.

When used on a suction or wet return line, the arrow on the valve should point in the direction of normal fluid flow. When used on either gas or liquid legs of a flooded evaporator, the arrow on the valve body should point from the evaporator to the surge drum.

Before putting valves into service, all pipe connections, valve seats, bonnet seals, and stem seals should be tested for leaks at pressure levels called for in appropriate codes.

Pressure Pilot Adjustment

The default pressure set point in the pressure pilot is 0.69 bar (10 psi), but the pilot regulator should be adjusted to maintain a minimum set point of about 0.69 bar (10 psi) above the pressure of the defrost relief or equalizing line if it were required (otherwise the valve will never open). Each 0.69 bar (10 psi) represents approximately $\frac{1}{2}$ turn clockwise of the adjusting stem starting with the stem turned completely out.

To increase pressure set point regulator turn the stem in (clockwise). To decrease set point pressure, turn the stem out (counter-clockwise).

Manual Opening Operation

All valves contain a manual lift stem. If it is desired to hold open the CK-6D manually, remove Bottom Sealing Cap and turn the Lifting Stem inward as far as possible. The valve cannot close now until the Seat Lift Stem is once again turned out.



| | Maximum Stem Turns Required to Manually Open Valve | | | | | | | | | | | | |
|-----------|--|----------|----------------|-------|-------|-------------|--|--|--|--|--|--|--|
| Port Size | | Newsolly | Manual Opening | 'A' N | /lax. | Approximate | | | | | | | |
| mm | Inch | Normany | to Open | mm | Inch | Stem Turns | | | | | | | |
| | CK-6D DUAL GAS POWERED SUCTION STOP VALVE | | | | | | | | | | | | |
| 40 50 | 1⁵⁄8 2 | Opened | IN | 28.7 | 1.1 | 12 | | | | | | | |
| 65 | 21⁄2 | Opened | IN | 33.8 | 1.3 | 14 | | | | | | | |
| 75 | 3 | Opened | IN | 49.8 | 2.0 | 17.5 | | | | | | | |
| 100 | 4 | Opened | IN | 43.7 | 1.7 | 17 | | | | | | | |

Service Pointers

- Failure to close: (a) pilot solenoids are not operating due to low voltage or solenoid coil burnout. (b) Dirt lodged between the valve piston and the cylinder wall (disassemble and remove all dirt and burrs). (c) Manual lift stem is turned in, thereby mechanically holding the piston in the open position. (d) Strainer/ Disc in the Pilot line, flanges may be plugged (Remove and clean). (e) Pilot pressure source is not high enough; must be at least 0.35 bar (5 psi) above the main valve downstream pressure. (f) Solenoid coils are not being energized in the proper sequence.
- 2. Failure to open: (a) Dirt lodged between the valve piston and the cylinder walls (Disassemble and

remove dirt and burrs). (b) Main valve spring may be broken (replace spring). (c) Pressures between remote pressure source and main valve downstream pressures are not equalizing. Check for leakage through the pilot solenoids. Check for backward installation of the CK-6D preventing the equalization with downstream pressure. (d) Viscous oil can prevent the valve from opening.

3. Leakage through valve when closed: (a) There are dirt or chips under the main valve piston. Disassemble valve and clean thoroughly. b) Damage to piston plug seat surface or body seat. Replace entire valve piston and lap grind piston face into valve and seat bead if necessary.

| | | CK-6D Valve - E | olt Torque Recommendations | | |
|-------------|--|-------------------------------------|-------------------------------|-------|-------|
| Port | Size | Bolt Sizo | Itom Decorintion | Tor | que |
| mm | inch | BOIL SIZE | nem Description | N m | ft lb |
| 40 - 65 | 1 ⁵ / ₈ - 2-1/ ₂ | ³ / ₈ " - 16 | Cover - Adapter Screws | 40.1 | 30 |
| 75 - 100 | 3 - 4 | ⁵⁄ึ∗" - 11 | Cover - Adapter Screws | 101.7 | 75 |
| 40 - 65 | 1 ⁵ ⁄ ₈ - 2-½ | ⁵ / ₁₆ " - 18 | Bore - Plate Screws | 20.3 | 15 |
| 40 - 100 | 1 % - 4 | 1⁄4" - 20 | A2D/S6B/S6A Screws | 10.9 | 8 |
| 10,13 or 20 | ³ / ₈ , ¹ / ₂ or ³ / ₄ | ⁷ / ₁₆ " - 14 | Flange Bolt for Disc Strainer | 38.0 | 28 |
| 40 - 50 | 1 ⁵ ⁄∞ - 2 | ⁵⁄8" - 11 | Flange Bolt | 24.3 | 85 |
| 65 - 75 | 2 ½ - 3 | 3⁄4" - 10 | Flange Bolt | 142.4 | 105 |
| 100 | 4 | ⁷ / ₈ " - 9 | Flange Bolt | 203.4 | 150 |

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|----------|--|--|------|--|------|--|--|--|--|--|--|--|--|----------|
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Safe Operation (See 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 increases 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 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.

Warranty

All Refrigerating Specialties products are under warranty against defects 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 the 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 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 including any warranty of merchantability, or fitness for a particular purpose. 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.

WARNING - USER RESPONSIBILITY

Failure or improper selection or improper use of the products 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 or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors. To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

For safety information see the Safety Guide at www.parker.com/safety or call 1-800-CParker.

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Gas Powered Suction Stop Valve

Product Bulletin 50-23 D

Type: CK-5

Purpose:

The CK-5 from Parker is a unique piston type gas powered suction stop valve, normally open, with a semi steel body, heavy duty constructed with control precision.

This valve incorporates a built-in mechanical fail-safe feature which prevents the undesirable effects of an immediate opening of the valve in the event of an electrical power failure while the evaporator is in defrost.

CK-5 is typically used for low temperature applications in overfeed or flooded systems, in wet return lines, on the liquid and gas return legs of flooded evaporators.



Contact Information:

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Product Features:

- Suitable for Ammonia, R-22, R-134a, R-404A, R-410A, R-507, and Other Common Refrigerants
- 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 Lines
- Valve may be mounted on its side
- Temperature Range: -51 to 104°C (-60 to 220°F)
- Maximum Rated Pressure (MRP): 28 barg (406 psig)
- Minimum Pressure Drop to Close: 0.35 bar (5 psi)



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| CK-5 Valve 125 to 150 mm (5 to 6") |
| |

Technical Data

| Body Material: 32 to 100 mm (1-1/4 to 4") LCB ASTM A-352 125 to 150 mm (5 to 6") | 2 n |
|--|---------|
| Seat: 32 mm (1-1/4") | E |
| Refrigerant Temperature Range | C =) |

Description

These valves are piston-type, gas powered, and normally open. They are heavy duty, semi-steel bodied valves that are built with control precision.

The 32 mm (1-1/4") port size has a PTFE main seat, the 40mm (1-5/8") port and larger have a metal to metal seat. The 100 mm (5") and 125 mm (6") port size versions of this unique suction stop valve utilize a larger capacity, remotely piped pilot operated solenoid, the Sporlan Division - Refrigeration Business Unit 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.

| Replacement Part Kits |
|---|
| CK-5 Valve 32 to 100 mm (1-1/4 to 4") |
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| |

Ambient Temperature Range:

| AC Coils60 to | o 60°C (-76 to 140°F) |
|--|-----------------------|
| DC Coils | o 60°C (-13 to 140°F) |
| Maximum Rated Pressure (MRP) | 28 bar (406 psig) |
| Minimum Pressure to Open | 0 bar (0 psig) |
| Minimum Pressure Above, Inlet Pressure t | o Close |
| Valve | 0.35 bar (5 psig) |

Purpose & Applications

The purpose of the CK-5 is to be used on low temperature applications to positively close wet return lines or on the liquid and gas return legs of flooded evaporators. Because of the spring, no line pressure drop is required to open de valve, it is normally open construction, pressure drop is minimal in suction or wet returns applications; besides normal gravity circulation is unrestricted on flooded evaporators.

Being pressure powered to close, this valve can overcome sticking at low temperatures caused by the presence of viscous oil. In addition, this unique control valve incorporates a built-in mechanical fail-safe feature which prevents the undesirable effect of an immediate opening of the valve in the event of an electrical power failure while the evaporator is in defrost.

| | CK-5 Valve General Information | | | | | | | | | | | | | |
|-----------|--------------------------------------|------------------|-----|-----------------------------|----------------|--------|--|-------------------------|-------------------|---------|-------|--------------|-----|--|
| Port Size | | Flow Coefficient | | Connections | | | | | | Weight | | | | |
| | | | | FPT ^[1] , SW, WN | | ODS | | Pilot Solenoid | Pressure Pilot | With Fl | anges | Less Flanges | | |
| mm | inch | Kv | Cv | mm | inch | mm | inch | | | Kg | Lbs | Kg | Lbs | |
| 32 | 1 ¹ / ₄ | 16 | 19 | 32*,40 | 1-1/4*, 11/2 | 40 | 15% | S6B ^[2] /S6A | A2D | 15 | 33 | 13 | 29 | |
| 40 | 1 ⁵ / ₈ | 32 | 37 | 38*,50 | 1½*, 2 | 54*,66 | 2 ¹ / ₈ *, 2 ⁵ / ₈ | S6B ^[2] /S6A | A2D | 28 | 62 | 25 | 55 | |
| 50 | 2 | 44 | 51 | 40,50* | 1½, 2* | 54*,66 | 2 ¹ / _{8*} , 2 ⁵ / ₈ | S6B ^[2] /S6A | A2D | 28 | 62 | 25 | 55 | |
| 65 | 2½ | 70 | 82 | 65*, 80 | 2 ½*, 3 | 66*,80 | 2⁵/8* ,3 ¹ /8 | S6B ^[2] /S6A | A2D | 36 | 79 | 34 | 75 | |
| 75 | 3 | 103 | 120 | 75 | 3 | 80*,92 | 3¹/8* ,3 ⁵ /8 | S6B ^[2] /S6A | A2D | 50 | 110 | 47 | 104 | |
| 100 | 4 | 171 | 200 | 100 | 4 | 105 | 4 ¹ / ₈ | S6B ^[2] /S6A | A2D | 74 | 163 | 71 | 157 | |
| 125 | 5 | 244 | 285 | 125 | 5 | | _ | S8F ^[3] | A4 | 131 | 289 | 128 | 282 | |
| 150 | 6 | 342 | 400 | 150 | 6 | | _ | S8F ^[3] | A4 | 207 | 456 | 204 | 450 | |

*Standard Connection.

1. FPT Flanges are only available in sizes: 32 to 50 mm (1-1/4 to 2").

2. Valves containing S6B coils can be installed in a vertical or horizontal position.

3. External and independent solenoid.

Parts Description



Figure 1: CK-5 Valve Part Descriptions, 32mm to 100mm (1-1/4" to 4") Port Size



Figure 2: CK-5 Valve Part Descriptions, 125mm to 150mm (5" to 6") Port Size

Principle of Operation

For closing of the CK-5 valve, high pressure gas from an external source is admitted through the pilot solenoid valve to the piston. This gas pressure acts on the piston, forcing it down, compressing the opening spring, firmly seating the valve's seat bead. The valve will not close unless pressure above the piston exceeds the downstream pressure by at least 0.35 bar (5 psig). After the termination of the hot gas injection period, the valve must re-open in order for refrigeration to resume.

For the CK-5 to open, the valve's pilot solenoid deenergizes, thereby interrupting the pilot stream flow of discharge gas to the top of the valve's piston. The main valve will continue to remain closed; however, since residual pressure in the coil is transmitted through passage "N" through the pilot regulator to the top of the piston (See Figure 1 and 2).

NOTE: The pilot regulator should keep or maintain a minimal set point, approximately 0.69 barg (10 psig) above the pressure of the defrost relief or equalizing line.

Under a standard defrost sequence for most low temperature evaporators, a "bleed down" or vent solenoid will energize to slowly equalize pressures between the coil and the suction line. It is imperative to incorporate a "bleed down" solenoid in a defrost group of control valves which includes a CK-5 (See Fig. 5, 6, and 7). Without this gradual equalization period, which generally takes one to two minutes, the CK-5 will stay closed for a prolonged period of time as the coil pressure slowly equalizes in series through the pilot regulator, then through the piston bleed hole.

The ability of the CK-5 to stay closed during an interruption of power, while an evaporator is in the process of defrosting, is its single greatest advantage. Where power failures can occur regularly, consideration should be given to this unique valve. By design, a standard CK-2, or a competitive valve with a similar design, would open immediately as residual coil pressure surges through the valve should power to the pilot solenoid suddenly be interrupted during a defrost. The design of the CK-5 prevents this from occurring and prevents the dangerous consequences to the system under these conditions.

In the event the CK-5 pilot solenoid de-energizes due to a power failure while the evaporator is in defrost, the defrost coil pressure (typically at or about 4.8 barg (70 psig) for ammonia) will continue to be transmitted through passage "N", through the pilot regulator and to the top of the piston. This pilot pressure acts as a "closing" force acting upon the larger effective area of the top of the piston and will overcome the "opening" force of coil pressure working against the underside of the piston. The valve will therefore remain closed due to the greater closing force until the coil pressure is equalized through the piston bleed hole.

If the defrost relief line is connected to an intermedia pressure/temperature line (higher than the suction line of the particular application), the pressure setting of pressure pilot of the CK-5 needs to be 0.69 barg (10 psig) above the pressure of the defrost relief or equalizing line, otherwise the valve will not open.

The larger the evaporator, and the greater its internal volume, the longer this venting or equalization period will require. By utilizing a bleed down solenoid in the control group during the standard defrost sequence, the CK-5 will return to its open position immediately after the equalizing period which is controlled by the time clock.

Electrical

The pilot solenoids used on CK-5 stop valves, type S6A or S6B, are unique to the Sporlan Division - Refrigeration Business Unit line of control valves. The coils are designed for long life and powerful opening force. The standard coil housing meets special requirements, this sealed construction can withstand direct contact with moisture and ice. For class "H" coil construction will permit coil temperatures, as measured by resistance method, as high as 180°C (356°F). By definition, class "F" coil construction will permit coil temperatures as measured by resistance method, as high as 180°C (356°F). By definition, class "F" coil construction will permit coil temperatures, as measured by resistance method, as high as 155°C (311°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. A solenoid coil should never be energized except when mounted on its corresponding solenoid tube.

The solenoid coil must be connected to an electrical line with Volts and Hertz the same as stamped on the 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 coil voltage above or below these limits may result in coil burnout. Also, operating with a coil voltage below the limit will definitely result in lowering the valve's maximum opening pressure differential.

CK-5 General Coil Information

| | | \$ | 66B Coils | | | |
|--------------------|---------------|-----------------|------------------------|------|------------------------|------------------|
| Coil (Volts/Hz) | Power Lead | Neutral Lead | Neutral Lead (Amps) | | Fuse Size (Amps) | Temp °C (°F) |
| 110-120 /50-60 | Black | Green | 0.66 | 0.42 | 1 | |
| 208/50 | Black | Green | 0.35 | 0.22 | 1 | 180°C (356°F) |
| 220-240 /50-60 | Black | Green | 0.33 | 0.21 | 1 | |

| | | | S6A Coils | | | |
|--------------------|---------------|-----------------|-----------------------------|------------------------------|------------------------|-----------------|
| Coil (Volts/Hz) | Power Lead | Neutral Lead | Inrush Current (Amps) | Running Current (Amps) | Fuse Size (Amps) | Temp °C (°F) |
| 24/50 | Brown | White | 6.82 | 2.99 | 4 | 250 (482) |
| 24/60 | Brown | White | 6.70 | 2.73 | 4 | 250 (482) |
| 48/50 | Brown | White | - | 1.07 | - | 250 (482) |
| 115/50 | Purple | White | 1.22 | 0.21 | 1 | 90 (194) |
| 120/60 | Blue | White | 1.18 | 0.46 | 1 | 90 (194) |
| 208/60 | Red | White | 0.63 | 0.24 | 1 | 90 (194) |
| 230/50 | Yellow | White | 0.65 | 0.26 | 1 | 90 (194) |
| 240/50 | Black | White | 0.59 | 0.24 | 1 | 90 (194) |
| 240/60 | Orange | White | 0.60 | 0.23 | 1 | 98 (208) |
| 12 DC | Brown | White | - | - | - | - |
| 24 DC | Brown | White | 6.70 | 6.70 | _ | 204 (400) |
| 48 DC | Brown | White | - | _ | _ | _ |

Notes:

Leaded coils are provided with 18 gauge wires at 914 mm (36") in length.

See current price list ILP- for coil part numbers.

| Pilot | Туре | Image | Terminal Diagram | Classification | Voltages/ Frequencies | Wattage (Holding) | Certifications |
|-------|--------|-------|--|--|---|--|--------------------------------|
| | Leaded | | Start Winding: White Wire End Winding: Black Wire | Class "F" approved system with housing meeting 3R and 4 requirements 18" Leaded Wires NEMA 3R and 4 | 24 VAC/50 Hz 24 VAC/60 Hz 115 VAC/50 Hz 120 VAC/60 Hz 208 VAC/60 Hz 230 VAC/50 Hz 240 VAC/50 Hz 240 VAC/50 Hz 240 VAC/60 Hz 12 VDC ^[1] 24 VDC ^[1] | - 34.0 32.5 32.5 35.0 37.5 - 32 | CSA UL ^[2] |
| S6A | DIN QD | | Ground | Class "F" approved system with housing meeting 3R and 4 requirements NEMA 3R and 4 IP65 | 24 VAC/50 Hz 48 VAC/50 Hz 115 VAC/50 Hz 230 VAC/50 Hz 240 VAC/50 Hz | 42.5 N/A 34.5 30.0 | CSA CE UL ^[2] |
| | | | Ground C 1 2 1 3 Terminal 1- Power Terminal 2- Electrical Neutral | Class "F" approved system with housing meeting 3R and 4 requirements NEMA 3R and 4 | 24 VAC/60 Hz 120 VAC/60 Hz 240 VAC/60 Hz 24 VDC ^[1] 48 VDC ^[1] | 35.5 37.5 32.0 42.5 | CSA UL ^[2] |
| S6B | Leaded | | Start Winding: White Wire End Winding: Black Wire | Standard Molded Class "H" #18 AWG 18" Leaded Wires NEMA 3R and 4 | 110/120 VAC 50/60 Hz 208 VAC 60 Hz 220-240 VAC 50/60 Hz | 18.5 W | CE |

Notes:

- Consult factory for other voltages/frequencies.

- See current price list ILP- for coil part numbers.

- Optional LED pilot light knob kit (green or red) that indicates when the coil is energized. LED knob kits can be used with 115 to 240 Volts AC coils only.

[1] DC coils are limited to an ambient temperature of -25°C to 60°C (-13°F to 140°F).

[2] Only on approved coils.

Explosion View & Material List



Figure 3: Explosion View CK-5 Gas Powered Suction Stop Valve 32 to 100mm (1-1/4 to 4") Port Size

CK-5 32 to 100mm (1-1/4 to 4") Material List

| Item | Description | Material | Qty |
|------|--|---------------------------|-----|
| 1 | Seal Cap, A2D | Aluminum 2011-T3 | 1 |
| 2 | Gasket, Seal Cap, A2D | Nylon | 1 |
| 3 | Nut, Packing, A2D | 303 S.S. | 1 |
| 4 | Packing, Stem, A2D | Crane Foil | 1 |
| 5 | Washer, Packing, A2D | Teflon, Carbon | 1 |
| 6 | Stem, Pressure Pilot, A2D | 303 S.S. | 1 |
| 7 | Bonnet, A2D | Cast Iron | 1 |
| 8 | Screw, Pressure Pilot, A2D | Steel Grade 5 Zinc | 8 |
| 9 | Nameplate, A2D | Aluminum | 1 |
| 10 | Bolt, Name Plate, A2D | Stl. Zinc Plated | 2 |
| 11 | Plate, Spring, Upper, A2D | Carbon Steel | 1 |
| 12 | Spring, Range A, A2D | ASTM A401 | 1 |
| 13 | Plate, Spring, Lower, A2D | Carbon Steel | 1 |
| 14 | Follower, Diaphragm, A2D | Carbon Steel | 1 |
| 15 | Gasket, Diaphragm, A2D | Garlock 2930 Non-asbestos | 1 |
| 16 | Diaphragm, A2D | Stainless Steel | 1 |
| 17 | Seat, A2D | 303SS ASTM A582 | 1 |
| 18 | Gasket, Bonnet, A2D | Garlock 2930 Non-asbestos | 1 |
| 19 | Body base, A2D | Cast Iron | 1 |
| 20 | Bolt,A2D HEX HD ¼" - 20 x 1-¼" L | Steel Grade 5 Zinc | 4 |
| 21 | O-ring, A2D | Neoprene | 2 |
| 22 | Bolt, Disc Strainer 7/16" - 14 x 2- 1/2" L | Steel Grade 5 Zinc | 2 |
| 23 | Flange, Disc Strainer | ASTM A-105 | 2 |
| 24 | Gasket, Disc Strainer | Garlock 2930 Non-asbestos | 2 |
| 25 | Strainer, Disc, 60 mesh | Carbon 1213/1215 | 1 |
| 26 | Nut, Disc Strainer | 416 SS | 2 |
| 27 | Pipe, Nipple 3/8" x 2L, Disc Strainer | 1117 Steel | 1 |
| 28 | Screw, Adapter, CK-5 | Steel Grade 5 Zinc | 8 |
| 29 | Cover, Top, CK-5 | Ductile Iron | 1 |
| 30 | Gasket, Cover, CK-5 | Garlock 2930 Non-asbestos | 1 |
| 31 | Adapter, CK-5 | Cast Iron | 1 |
| 32 | Gasket, Adapter, CK-5 | Garlock 2930 Non-asbestos | 1 |
| 33 | Piston, Plug, CK-5 | Ductile Iron ASTM A-536 | 1 |
| 34 | Spring, Manual Opening, CK-5 | ASTM A229 | 1 |
| 35 | Stem, Manual Opening, CK-5 | 416 SS | 1 |
| 36 | Body CK-5 | LCB ASTM A-352 | 1 |
| 37 | Screw, Bottom Cover, CK-5 | Steel Grade 5 Zinc | 8 |
| | Nut Flange, CK-5 Body 32 to 50 mm (1-¼ to 2") 5/8" - 11 | | |
| 38 | Nut Flange, CK-5 Body 65 to 75 mm (2-½ to 3") ¾" - 10 | Steel | 8 |
| | Nut Flange, CK-5 Body 100 mm (4") 7/8" - 9 | | |
| 39 | Gasket, Flange, CK-5 | Garlock 2930 Non-asbestos | 2 |
| 40 | Male Flange, CK-5 Body 32 to 100 mm (1-1/4 to 4") | ASTM A-105 | 2 |

| Item | Description | Material | Qty |
|------|--|-------------------------------|-----|
| | Bolt Flange, CK-5 Body 32 mm (1-1/4") SQ HD 5/8" - 11 X 2-¾"L | | |
| | Bolt Flange, CK-5 Body, 40 to 50 mm (1-5/8 to 2") BLT, SQ HD 5/8" - 11 X 3-¼"L | | |
| 41 | Bolt Flange, CK-5 Body, 65 to 75 mm (2-1/2 to 3") BLT, SQ HD %" - 10 X 3-%"L | ASTM A 307 GR A ZINC | 8 |
| | Bolt Flange, CK-5 Body, 100 mm (4") BLT, SQ HD 7/8"- 9 X 4-½"L | | |
| 42 | Washer, Flat, CK-5 | Soft AISI 1010 Carbon Steel | 1 |
| 43 | Packing, Stem, CK-5 | ASTM F2168 | 1 |
| 44 | Nut, Packing, CK-5 | 416 SS | 1 |
| 45 | Gasket, Seal Cap Bottom, CK-5 | Nylon | 1 |
| 46 | Seal Cap, CK-5 | Aluminum 2011-T3 | 1 |
| 47 | Clip Retainer for S6B Coil Solenoid Pilot | Spring Steel | 1 |
| 48 | Coil for S6B Solenoid Pilot | Standard Molded Class H | 1 |
| 49 | Body, S6B Solenoid Pilot | AISI 1214 steel | 1 |
| 50 | Bolt, S6A/S6B Solenoid Pilot HEX HD ¼" - 20 x 2-¼" L | Steel Grade 5 Zinc | 4 |
| 51L | LED Knob Kit, S6A Coil, Solenoid Pilot | - | 1 |
| 51S | Standard Knob Kit, S6A Coil, Solenoid Pilot | - | 1 |
| 52 | O-ring, S6A Coil Solenoid Pilot | Ethylene Propylene | 1 |
| 53 | Coil for S6A Solenoid Pilot | Encapsulated | 1 |
| 54 | Nut, Solenoid Tube, S6A Solenoid Pilot | Steel AISI 1010 or AISI 12L14 | 1 |
| 55 | Solenoid Tube S6A, VAC Coil, Solenoid Pilot | 304 S.S. | 1 |
| 56 | Gasket, Tube S6A, Solenoid Pilot | Wolverine | 1 |
| 57A | Plunger/Needle Assembly S6A, VAC Coil | Silicon Iron B Steel | 1 |
| 57D | Plunger/Needle Assembly S6A, VDC Coil | Silicon Iron B Steel | 1 |
| 58 | Seat Assembly, S6A Solenoid Pilot | 416 S.S. ASTM A484 | 1 |
| 59 | Body, S6A Solenoid Pilot | ASTM A536 | 1 |

| | Ch | <-5 32 to 100mn | mm (1-1/4 to 4") Replacement Part Kits | | | | | | | | | | | |
|---------------------------|----------------------------------|----------------------|--|--------|--------|-----------|--------|--------|--|--|--|--|--|--|
| - | | | | | Port | Size | | | | | | | | |
| Item | Kit Desc | ription | 32 mm | 40 mm | 50 mm | 65 mm | 75 mm | 100 mm | | | | | | |
| | | | (1 ¹ ⁄4") | (1%") | (2") | (21/2") | (3") | (4") | | | | | | |
| 1, 2 | Seal Cap Kit, Pressure | Pilot A2D | | | 202 | 2110 | | | | | | | | |
| 2 (12) | Gasket Pkg, Seal Cap | Pressure Pilot | | | 202 | 2408 | | | | | | | | |
| 3-5 | Packing Kit, Stem Pres | sure Pilot | | | 202 | 2100 | | | | | | | | |
| 4 (25) | Stem Packing, Pkg. Pre | essure Pilot | | | 202 | 2478 | | | | | | | | |
| 4-6 | Stem Kit, Pressure Pilo | t A2D | | | 202 | 2120 | | | | | | | | |
| 8 (8) | Bolt Pkg. Kit, Bonnet P | ressure Pilot A2D | | | 202 | 2246 | | | | | | | | |
| 3-6, 11-14 | Spring/Stem Kit, Range | e A, Pressure Pilot | | | 202 | 2006 | | | | | | | | |
| 11-13, 15 | Spring Kit, Range A, Pr | ressure Pilot | | | 202 | 2481 | | | | | | | | |
| 15, 16, 18 | Diaphragm Kit, Pressur | re Pilot A2D | | | 200 |)770 | | | | | | | | |
| 15-18 | Seat/Diaphragm Kit, Pr | essure Pilot | | | 202 | 2001 | | | | | | | | |
| 20 (4), 21 (2) | Bolt/O-ring Kit, Pressu | re Pilot A2D | | | 201 | 572 | | | | | | | | |
| 21 (12) | O-ring Pkg, Pressure P | ilot | 202424 | | | | | | | | | | | |
| 1-21 | Complete Modular Pres Range A | ssure Pilot A2D, | | | 201 | 1675 | | | | | | | | |
| 21 (2), 50 (4) | Bolt/O-ring Kit, S6A or | S6B Solenoid Pilot | | | 201 | 1574 | | | | | | | | |
| 22 (2), 26 (2) | Bolts and Nuts, for Dise | c Strainer | | | 201 | 580 | | | | | | | | |
| 24 (2), 25 | Strainer Kit, Disc | | | | 200 |)912 | | | | | | | | |
| | | 10mm (3/8") FPT | 201665 | | | | | | | | | | | |
| | Strainer Kit, Disc with | 10mm (3/8") SW | | | 201 | 1704 | | | | | | | | |
| 22-27 | Flanges, Bolts, Nuts, | 13mm (½") FPT | | | 201 | 706 | | | | | | | | |
| | and Gaskets | 13mm (½") SW | | | 201 | 707 | | | | | | | | |
| | | 20mm (¾") SW | | | 201 | 1710 | | | | | | | | |
| 28 (8), 29, 30 | Cover Kit, CK-5 | · | | | 204 | 1701 | | | | | | | | |
| 30-32 | Adapter Kit, CK-5 | | 204702 | 204 | 1703 | 204704 | 204705 | 204706 | | | | | | |
| 30, 32 | Gasket Kit, Adapter CK | -5 | | | Consul | t factory | | | | | | | | |
| 32-33 | Piston Kit, CK-5 | | 204750 | 204749 | 204757 | 204756 | 204755 | 204760 | | | | | | |
| 34 | Spring Kit, CK-5 | | 301528 | 301 | 490 | 301494 | 301505 | 301500 | | | | | | |
| 35, 42-44 | Stem Kit, CK-5 | | 201514 | 201 | 133 | 201118 | 201216 | 251123 | | | | | | |
| 37 (8) | Bolt, Adapter CK-5 | | | | 202 | 2248 | | | | | | | | |
| 38 (4), 39 (1), 41 (4) | Union Kit per Flange Cł | <-5 | 206215 | 206 | 516 | 206217 | 206218 | 206219 | | | | | | |
| 38 (8), 41(8) | Bolts and Nuts Pkg. Fla | inges per CK-5 Valve | 201595 | 201 | 604 | 201 | 614 | 206052 | | | | | | |
| 39 (12) | Gasket Kit, Flange CK- | 5 | 202080 | 202 | 2081 | 202082 | 202083 | 202084 | | | | | | |
| | FPT | | 200030 | 200039 | 200040 | _ | _ | _ | | | | | | |
| 40 (2) | Flange, CK-5 Body | SW | 200032 | 200041 | 200042 | 200049 | 200054 | 200063 | | | | | | |
| | | WN | 200034 | 200043 | 200044 | 200050 | 200055 | 200064 | | | | | | |
| 42-44 | Packing Kit, Manual Op | ening Stem CK-5 | 5 202100 202101 | | | | | | | | | | | |
| 45-46 | Cap Kit, CK-5 | | 202110 202144 20211 | | | | | | | | | | | |

| | CK- | 5 32 to 100mm (1· | -1/4 to 4") I | Replaceme | nt Part Kits | s (Cont.) | | | | | | | |
|--------------------------|----------------------------------|---|-------------------------------|-------------------------------|--------------------------|-------------------------------|-----------------|----------------|--|--|--|--|--|
| | | | | | Port | Size | | | | | | | |
| Item | Kit De | scription | 32 mm (1 ¹ ⁄4") | 40 mm (1 ⁵ ⁄%") | 50 mm (2") | 65 mm (2 ¹ ⁄2") | 75 mm (3") | 100 mm (4") | | | | | |
| 47 (12) | Clip Retainer for S6E | Coil, Kit | | | 206 | 516 | | | | | | | |
| 48 | Coil, S6B, Solenoid F | Pilot | Refers to c | urrent price list | ILP- to get the frequ | coil part numbe iency | er according to | voltage and | | | | | |
| 21 (2), 49, 50 (4) | Modular Solenoid Pile | ot, S6B | 205073 | | | | | | | | | | |
| 51S, 52 | Standard Knob Kit, S (no LED) | 6A Solenoid Pilot | | | 205 | 237 | | | | | | | |
| E11 E0 | LED Knob Kit, S6A | Green | 208543 | | | | | | | | | | |
| 51L, 52 | Solenoid Pilot | Red | | | 208 | 544 | | | | | | | |
| 53 | Coil, S6A Solenoid P | ilot | Refers to c | urrent price list | ILP- to get the frequ | coil part numbe iency | er according to | voltage and | | | | | |
| 54-56 | Tube Kit, Solenoid S6 | A | | | 209 | 320 | | | | | | | |
| 56, 57A, 58 | Plunger Seat Kit, S6A | VAC | | | 201 | 630 | | | | | | | |
| 56, 57D, 58 | Plunger Seat Kit, S6A | CK-5 32 to 100mm (1-1/4 to 4") Replacement Part Kits (Cont.) Port Size Size 32 mm 40 mm 50 mm (2") 65 mm (2") 75 mm (3") 100 (4") tainer for S6B Coil, Kit 206516 SB, Solenoid Pilot 206516 SB, Solenoid Pilot, S6B 205073 colspan="4">Colspan="4"Colspan="4">Colspan="4"Colspan="4">Colspan="4"Colspan= | | | | | | | | | | | |
| 21 (2), 50 (4), 54-59 | Modular Solenoid Pile | ot, S6A VAC | | | 251 | 138 | | | | | | | |



CK-5 125 to 150mm (5 to 6") Material List

| Item | Description | Material | Qty |
|------|--|--|-----|
| 1 | Seal Cap, Pressure Pilot | Aluminum 2011-T3 | 1 |
| 2 | Gasket, Seal Cap, Pressure Pilot | Nylon | 1 |
| 3 | Nut, Packing, Pressure Pilot | 303 S.S. | 1 |
| 4 | Packing, Stem, Pressure Pilot | Crane Foil | 1 |
| 5 | Washer, Packing, Pressure Pilot | Teflon, Carbon | 1 |
| 6 | Stem, Pressure Pilot | 303 S.S. | 1 |
| 7 | Bonnet, Pressure Pilot | Cast Iron | 1 |
| 8 | Screw, Pressure Pilot HEX HD 5/16-18X7/8L | Steel Grade 5 Zinc | 8 |
| 9 | Plate, Spring, Upper, Pressure Pilot | Carbon Steel | 1 |
| 10 | Spring, Range A, Pressure Pilot | ASTM A401 | 1 |
| 11 | Plate, Spring, Lower, Pressure Pilot | Carbon Steel | 1 |
| 12 | Follower, Diaphragm, Pressure Pilot | Carbon Steel | 1 |
| 13 | Gasket, Diaphragm, Pressure Pilot | Garlock 2930 Non-asbestos | 1 |
| 14 | Diaphragm, Pressure Pilot | Stainless Steel | 1 |
| 15 | Seat, Pressure Pilot | 303SS ASTM A582 | 1 |
| | Screw, Adapter CK-5, 125 mm (5") BLT,HEX HD 5/8 -11X2-1/4L | | 8 |
| 16 | Screw, Adapter CK-5, 150 mm (6") BLT,HEX HD 3/4-10X2-3/4L | Steel Grade 5 Zinc | 10 |
| 17 | Gasket, Bonnet | Garlock 2930 Non-asbestos | 1 |
| 18 | Name Plate, CK-5 | Aluminum | 1 |
| 19 | Plug for Gauge, 3/8" NPT, CK-5 | Steel, Zinc Plate | 1 |
| 20 | Adapter, CK-5 | 1018 Steel | 1 |
| 21 | Gasket, Adapter, CK-5 | Garlock 2930 Non-asbestos | 1 |
| 22 | Piston, Plug, CK-5 | Ductile Iron ASTM A-536 | 1 |
| 23 | Body CK-5 | Gray Cast Iron | 1 |
| 24 | Gasket, Flange, CK-5 | Garlock 2930 Non-asbestos | 2 |
| 25 | Flange, CK-5 | ASTM A-105 | 2 |
| 26 | Nut Flange, CK-5 Body | Steel | 16 |
| 27 | Bolt Flange, CK-5 Body | ASTM A 307 GR A | 16 |
| | SQ HD 3/4 - 10X4- 1/2L | | |
| 28 | Spring, Manual Opening, CK-5 | ASTM A229 | 1 |
| 29 | Stem, Manual Opening, CK-5 | 416 SS | 1 |
| 30 | Gasket, Cover Bottom, CK-5 | Garlock 2930 Non-asbestos | 1 |
| 31 | Bottom Cover, CK-5 | Ductile Iron | 1 |
| 32 | Bolts, Bottom Cover, CK-5 125 mm (5") HEX HD 5/8 -11X2L | - Steel GR 5 Zinc | 6 |
| | Bolts, Bottom Cover, CK-5 150 mm (6") HEX HD 3/4 -10X2-1/4L | | 8 |
| 33 | Washer, Flat, Bottom CK-5 | Soft AISI 1010 Carbon Steel | 1 |
| 34 | Packing, Stem, CK-5 | ASTM F2168 | 1 |
| 35 | Nut, Packing, CK-5 | 416 SS | 1 |
| 36 | Gasket, Seal Cap, Bottom CK-5 | Nylon | 1 |
| 37 | Seal Cap, Bottom CK-5 | Aluminum 2011-T3 | 1 |
| 38 | Pipe, Nipple 3/8" x 2L, CK-5 | 1117 Steel | 1 |
| 39 | Nut, Disc Strainer, CK-5 | 416 SS | 2 |
| 40 | Flange, Disc Strainer, CK-5 | ASTM A-105 | 2 |
| 41 | Gasket, Disc Strainer, CK-5 | Garlock 2930 Non-asbestos | 2 |
| 42 | Strainer, Disc, 60 mesh, CK-5 | Carbon 1213/1215 | 1 |
| 43 | Bolt, Disc Strainer 7/16" - 14 x 2- 1/2" L | Steel Grade 5 Zinc | 2 |
| 44L | LED Knob Kit, S8F Coil | - | 1 |
| 44S | Standard Knob Kit, S8F Coil | - | 1 |

| Item | Description | Material | Qty |
|------|--|-------------------------------|-----|
| 45 | O-ring, S8F Coil | Ethylene Propylene | 1 |
| 46 | Coil for S8F | Encapsulated | 1 |
| 47 | Nut, Solenoid Tube S8F | Steel AISI 1010 or AISI 12L14 | 1 |
| 48 | Solenoid Tube S8F, AC Coils | 304 S.S. | 1 |
| 49 | Gasket, Tube S8F | Wolverine | 1 |
| 50A | Plunger/Needle Assembly S8F, VAC Coils | Silicon Iron B Steel | 1 |
| 50D | Plunger/Needle Assembly S8F, VDC Coils | Silicon Iron B Steel | 1 |
| 51 | Piston Plug Assembly S8F | AISI 1213/1215 C.R.S/Teflon | 1 |
| 52 | Nut Flange, S8F Body | Steel | 2 |
| 53 | Flange, Body S8F | ASTM A105 | 2 |
| 54 | Gasket Flange, Body S8F | Garlock 2930 Non-asbestos | 2 |
| 55 | Body, S8F Solenoid Pilot | Ductil Iron ASTM A536 | 1 |
| 56 | Name Plate, S8F | Aluminum | 1 |
| 57 | Bolt Flange, S8F Body | Steel Grade 5 Zinc | 2 |
| 58 | Stem, Manual Opening S8F | 416 S.S. | 1 |
| 59 | Washer, Flat, S8F | H.R. or C.R. Steel | 1 |
| 60 | Packing, Stem S8F | ASTM F2168 | 1 |
| 61 | Nut, Packing S8F | AISI 1213/1215 C.R.S | 1 |
| 62 | O-ring, Seal Cap Bottom S8F | Neoprene | 1 |
| 63 | Seal Cap S8F | Valox 420 Black | 1 |

| | CK-5 | 125 to 150mm (5 | (5 to 6") Replacement Part Kits | | | | | | | | |
|------------------|---------------------------------|-------------------|--|----------------|--|--|--|--|--|--|--|
| | | | Port | Size | | | | | | | |
| Item | Kit Descri | ption | 125 mm (5") | 150 mm (6") | | | | | | | |
| 1, 2 | Seal Cap Kit, Pressure Pilot | | 201 | 110 | | | | | | | |
| 2 (12) | Gasket Pkg, Seal Cap, Press | sure Pilot | 202 | 408 | | | | | | | |
| 3-5 | Packing kit, Stem, Pressure | Pilot | 202 | 100 | | | | | | | |
| 4 (25) | Stem Packing, Pkg, Pressure | e Pilot | 202 | 478 | | | | | | | |
| 4-6 | Stem Kit, Pressure Pilot | | 202 | 120 | | | | | | | |
| 8 (8) | Bolt Pkg. Pressure Pilot | | 202 | 246 | | | | | | | |
| 3-6, 9-12 | Spring/Stem Kit, Pressure Pi | lot | 202 | 006 | | | | | | | |
| 9-11, 13 | Spring Kit, Range A, Pressur | e Pilot | 202481 | | | | | | | | |
| 13, 14, 17 | Diaphragm Kit, Pressure Pilo | t | 200770 | | | | | | | | |
| 13-15, 17 | Seat/Diaphragm Kit, Range / | A, Pressure Pilot | 202001 | | | | | | | | |
| 1-13 | Bonnet/Spring Kit, Range A, | Pressure Pilot | 202008 | | | | | | | | |
| 16 | Bolt, Adapter CK-5 | | Consult | factory | | | | | | | |
| 17, 19, 20, 21 | Adapter Kit, CK-5 | | 204753 | 204754 | | | | | | | |
| 17, 21 | Gasket Kit, Adapter CK-5 | | Consult | factory | | | | | | | |
| 21, 22 | Piston Kit, CK-5 | | 204759 | 204758 | | | | | | | |
| 24 | Gasket Pkg. Flange, CK-5 B | ody | 202085 | 202086 | | | | | | | |
| | | SW | 200070 | 200074 | | | | | | | |
| 25 (2) | Flange, CK-5 Body | SW ANSI | 200072 | 200076 | | | | | | | |
| | | WN | 200071 | 200075 | | | | | | | |
| 26 (16), 27 (16) | Bolt Pkg. Flange, CK-5 Body | 1 | 202 | 262 | | | | | | | |
| 28 | Spring Kit, CK-5 | | 301511 301534 | | | | | | | | |
| 29, 30, 33-35 | Stem Kit, CK-5 | | 202363 | 202364 | | | | | | | |
| 30-31, 33-35 | Bottom Cover Kit, CK-5 | | 200724 | 200755 | | | | | | | |
| 32 | Bolt, Bottom Cover, CK-5 | | 202250 | 202539 | | | | | | | |
| 33-35 | Packing Kit, Manual Opening | Stem CK-5 | 202 | 101 | | | | | | | |
| 36-37 | Cap Kit, CK-5 | | 202 | 111 | | | | | | | |
| 41(2), 42 | Strainer Kit, Disc | | 200 | 912 | | | | | | | |
| 39 (2), 43 (2) | Bolts and Nuts, Disc Strainer | | 201 | 580 | | | | | | | |
| | | 10mm (3/8") FPT | 201 | 665 | | | | | | | |
| | Strainer Kit, Disc with | 10mm (3/8") SW | 201 | 704 | | | | | | | |
| 38-43 | Flanges, Bolts, Nuts, and | 13mm (½") FPT | 201 | 706 | | | | | | | |
| | Gaskels | 13mm (½") SW | 201 | 707 | | | | | | | |
| | | 20mm (¾") SW | 201 | 710 | | | | | | | |
| 44S, 45 | Knob kit, S8F Solenoid (no Ll | ED) | 205 | 237 | | | | | | | |
| 44L, 45 | LED Knob Kit, S8F | Green | 208 | 543 | | | | | | | |
| | Solenoid | Red | 208 | 544 | | | | | | | |
| 46 | Coil, S6A | | Refer to current price list ILP- to get the coil part number according to voltage and frequency | | | | | | | | |
| 47-49 | Tube Kit, Solenoid S8F | | 209320 | | | | | | | | |
| 49, 50A | Plunger Kit, Needle, S8F VAC | ; | 201019 | | | | | | | | |
| 49, 50D | Plunger Kit, Needle, S8F VDC | ; | 201 | 021 | | | | | | | |
| 49, 51 | Plunger Kit, Piston S8F | | 251 | 387 | | | | | | | |
| 49, 50A, 51 | Plunger Piston Kit, S8F VAC | | 202 | 072 | | | | | | | |
| | Bolt Kit, for S8F body and fla | nges | 201 | 579 | | | | | | | |
| 52 (2), 57 (2) | Bolt Kit, for S8F body, straine | r and flanges | 201576 | | | | | | | | |

| | CK-5 12 | 5 to 150mm (5 to | 6") Replacement Part Kits (Co | nt.) |
|-----------------------------|---------------------------------------|------------------|-------------------------------|----------------|
| | | | Port | Size |
| Item | Kit Desci | ription | 125 mm (5") | 150 mm (6") |
| | | 10mm (3/8") FPT | 200 | 001 |
| | | 10mm (3/8") SW | 200 | 005 |
| | | 10mm (3/8") WN | 200 | 009 |
| | | 13mm (½") FPT | 200 | 002 |
| 53 (2) | 2) Male Flanges Kit, per S8F Valve | 13mm (½") SW | 200 | 006 |
| | | 13mm (½") WN | 200 | 010 |
| | | 20mm (¾") FPT | 200 | 003 |
| | | 20mm (¾") SW | 200 | 007 |
| | | 20mm (¾") WN | 200 | 011 |
| 54 (12) | Gasket Kit, Flange S8F | | 202 | 078 |
| 58-61 | Stem Kit, Opening S8F | | 202 | 238 |
| 62-63 | Seal Cap, S8F | | 209 | 916 |
| 47-50A, 51, 55-56, 58-63 | Complete Valve Body Asser | mbly, S8F VAC | 100 | 997 |
| 47-50D, 51, 55-56, 58-63 | Complete Valve Body Assembly, S8F VDC | | 102 | 031 |

Dimensions

CK-5 Valve Dimensions 32mm to 100mm (1-1/4" to 4") Port Size



FPT, SW, & ODS Flanges

Clearance Zone:

- 1. The top of the CK-5 32mm to 100mm (1-1/4" to 4") requires a clearance of 76 mm (3") for the removal of the disc strainer, operation of pilot regulator.
- 2. The bottom of the CK-5 valve requires a clearance of 102 mm (4") for the removal of bottom cover.
- 3. Both the left and right side of the CK-5 valve requires a minimum of 76 mm (3") on each side.

| Port | Size | ļ | 4 | B | ;* | (| c | ŀ | 1 | | J | ŀ | ٢ | l | L |
|---------|--------------------------|-------|------|-------|------|-------|----------|-------|------|-------|------|-------|------|-------|------|
| mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch |
| 32 | 1 ¹ /4 | 203.2 | 8.0 | 119.5 | 4.7 | 403.6 | 15.9 | 117.5 | 4.6 | 178.0 | 7.0 | 137.0 | 5.4 | 106.1 | 4.2 |
| 40 - 50 | 15⁄8 - 2 | 250.8 | 9.9 | 133.7 | 5.3 | 457.2 | 18.0 | 144.5 | 5.7 | 251.0 | 9.9 | 143.1 | 5.6 | 112.3 | 4.4 |
| 65 | 21/2 | 252.4 | 9.9 | 142.4 | 5.6 | 480.1 | 18.9 | 160.3 | 6.3 | 315.0 | 12.4 | 151.9 | 6.0 | 121.1 | 4.8 |
| 75 | 3 | 311.2 | 12.3 | 211.1 | 8.3 | 564.3 | 22.2 | 188.1 | 7.4 | 315.0 | 12.4 | 167.9 | 6.6 | 135.6 | 5.3 |
| 100 | 4 | 358.8 | 14.1 | 214.3 | 8.4 | 605.0 | 23.8 | 222.2 | 8.8 | 363.0 | 14.3 | 188.5 | 7.4 | 156.2 | 6.2 |

* Allow 25mm (1") below valve to operate manual opening stem

| Port | Sizo | | | [| כ | | | F | | | | | | | | |
|-----------|----------|--|--------|------|--|-------|------|---------------------------------|-------|------|------------|-------|------|--|--|--|
| For | 3120 | FP | T*, SW | | | ODS | | | WN | | DIN WN | | | | | |
| mm | inch | Connection | mm | inch | Connection | mm | inch | Connection | mm | inch | Connection | mm | inch | | | |
| 20 | -11/ | 1 1/4" | 254.0 | 10.0 | 15/" | 254.0 | 10.0 | 1 1/4" | 325.1 | 12.8 | 32mm | 304.8 | 12.0 | | | |
| 32 | 174 | 1 ½" | 254.0 | 10.0 | 17/8 | 254.0 | 10.0 | 1 ½" | 312.4 | 12.3 | 38mm | 312.4 | 12.3 | | | |
| 40 50 | 15/ 0 | 1 ½" | 207.2 | 10.1 | 2 ¹ /8" | 207.2 | 10.1 | 1 ½" | 365.8 | 14.4 | 38mm | 365.8 | 14.4 | | | |
| 40 - 50 | 1-78 - 2 | 2" | 307.3 | 12.1 | 2 ⁵ /8" | 307.3 | 12.1 | 2" | 378.5 | 14.9 | 50mm | 370.8 | 14.6 | | | |
| <u>CE</u> | 01/ | 2 ¹ / ₂ " | 017.5 | 10.5 | 2 ⁵ /8" | 017.5 | 10.5 | 2 ¹ / ₂ " | 388.6 | 15.3 | 6Emm | 200.6 | 15.0 | | | |
| 60 | 272 | 3" | 317.5 | 12.5 | 3 ¹ /8" | 317.5 | 12.5 | 3" | 406.4 | 16.0 | 0011111 | 300.0 | 15.3 | | | |
| 75 | 3 | 3" | 375.9 | 14.8 | 3 ¹ /8" 3 ⁵ /8" | 375.9 | 14.8 | 3" | 464.8 | 18.3 | 75mm | 464.8 | 18.3 | | | |
| 100 | 4 | 4" | 431.8 | 17.0 | 4 ¹ /8" | 431.8 | 17.0 | 4" | 551.2 | 21.7 | 100mm | 551.2 | 21.7 | | | |

 * FPT flanges are only available in 20 - 50mm ($^{3}\!/\!_{4}$ " - 2")

| | CK-5 Valve | | | | | | | | | | | | | | |
|------|-------------|-------|------|-------|------|-------|------|-------|------|-------|------|--|--|--|--|
| Port | Port Size A | | | E | 3 | |) | l | 1 | W | | | | | |
| mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | | | | |
| 125 | 5 | 393.7 | 15.5 | 307.9 | 12.1 | 185.3 | 7.3 | 653.9 | 25.7 | 257.2 | 10.1 | | | | |
| 150 | 6 | 508.0 | 20.0 | 347.6 | 13.7 | 264.7 | 10.4 | 750.6 | 29.6 | 323.9 | 12.8 | | | | |





Clearance Zone:

- 1. The top of the CK-5 125mm to 150mm (5" to 6") requires a clearance of 76 mm (3") for the removal of the disc strainer, operation of pilot regulator.
- 2. The bottom of the CK-5 valve requires a clearance of 102 mm (4") for the removal of bottom cover.
- 3. Both the left and right side of the CK-5 valve requires a minimum of 76 mm (3") on each side.

Installation

All personnel working on valves must be qualified to work on refrigeration systems. If there are any questions, contact Sporlan Division - Refrigeration Business Unit before proceeding with the installation.

All valves are packed for maximum protection. Unpack carefully, checking to make sure all items are unpacked. Save the enclosed instruction for the installer and eventual user.

 \triangle Do not remove the protective coverings from the inlet and outlet of the valve until the valve is ready to be installed.

Never install the valve with its pilot section directly beneath the main valve. The direct mounted pilot solenoid on the 32mm through 100mm (1-1/4" through 4") port size valves should be maintained above the center line on a horizontal pipe. When used on a suction or wet return line, the arrow on the valve should point in the direction of normal fluid flow. When used on either gas or liquid legs of a flooded evaporator, the arrow on the valve body should point from the evaporator to the surge drum.

Protect inside of valve from dirt and chips during installation. The CK-5 Suction Stop Valve may be installed on its side or vertically upright in either vertical or horizontal pipelines. Figure 5 illustrates the installation of the 32mm through 100mm (1-1/4" through 4") port size valves with a S6B solenoid in a horizontal pipeline. Figure 6 illustrates the installation of the 75mm and 100mm (3" and 4") port size CK-5 stop valves with a S6A solenoid in a vertical pipeline.

Figure 7 illustrates the installation of the 125mm and 150mm (5" and 6") port size CK-5 stop valves in a horizontal pipeline. A bypass equalizing solenoid valve, a requirement with any size CK-5, 'is also shown. The

remote discharge gas supply solenoid used with the larger 75mm through 150mm (3" through 6") valves, the R/S type S8F, is a gravity closing valve and must be mounted in a horizontal line with its manual opening stem in a vertical position as shown. Never install the valve with its pilot section directly beneath the main valve. The direct mounted pilot solenoid on the 32mm through 100mm (1-1/4" through 4") port size valves should be maintained above the center line on a horizontal pipe.

When used on a suction or wet return line, the arrow on the valve should point in the direction of normal fluid flow. When used on either gas or liquid legs of a flooded evaporator, the arrow on the valve body should point from the evaporator to the surge drum.

Before putting valves into service, all pipe connections, valve seats, bonnet seals, and stem seals should be tested for leaks at pressure levels called for in appropriate codes.

Pressure Pilot Adjustment

The default pressure set point in the pressure pilot is 0.69 bar (10 psi), but the pilot regulator should be adjusted to maintain a minimum set point of about 0.69 bar (10 psi) above the pressure of the defrost relief or equalizing line if it were required. Each 0.69 bar (10 psi) represents approximately $\frac{1}{2}$ turn clockwise of the adjusting stem starting with the stem turned completely out.

To increase pressure set point regulator turn the stem in (clockwise). To decrease set point pressure, turn the stem out (counterclockwise).

Manual Opening Operation

All valves contain a manual lift stem. If it is desired to hold open the CK-5 manually, remove Bottom Sealing Cap and turn Seat Lifting Stem inward as far as possible. The valve cannot close now until the Seat Lift Stem is once again turned out.



Figure 5: Installation Position (Horizontal) for a CK-5 32mm to 100mm (1-1/4" to 4") Port Size with S6B Solenoid





Figure 7: Installation Position (Vertical or Horizontal) for a CK-5 125mm to 150mm (5" to 6") Port Size with S8F Solenoid

Service Pointers

1. Failure to Close: (a) pilot solenoids are not operating due to low voltage or solenoid coil burnout. (b) Dirt lodged between the valve piston and the cylinder wall (disassemble and remove all dirt and burrs). (c) Manual lift stem is turned in, thereby mechanically holding the piston in the open position. (d) Strainer/Disc in the Pilot line, flanges may be plugged (Remove and clean). (e) Pilot pressure source is not high enough; must be at least 0.69 bar (10 psi) above the main valve downstream pressure. (f) Solenoid coils are not being energized in the proper sequence.

2. Failure to Open: (a) Dirt lodged between the valve piston and the cylinder walls (Disassemble and remove dirt and burrs). (b) Main valve spring may be broken (replace spring). (c) Pressures between remote pressure source and main valve downstream pressures are not equalizing. Check for leakage through the pilot solenoids. Check for backward installation of the CK-5 preventing the equalization with downstream pressure. (d) Viscous oil can prevent the valve from opening.

3. Leakage through Valve when Closed: (a) There are dirt or chips under the main valve piston. Disassemble valve and clean thoroughly. b) Damage to piston plug seat surface or body seat. Replace entire valve piston and lap grind piston face into valve and seat bead if necessary.

| CK-5 Valve - Bolt Torque Recommendations | | | | | | | | | | | | | |
|--|---|-------------------------------------|-------------------------------|--------|-------|--|--|--|--|--|--|--|--|
| Port | Size | Dalt Cine | Item Deservition | Torque | | | | | | | | | |
| mm | inch | Boil Size | | N m | ft lb | | | | | | | | |
| 32 - 150 | 1¼ - 6 | ⁵ / ₁₆ " - 18 | Cover Screws | 20.3 | 15 | | | | | | | | |
| 32 - 150 | 1¼ - 6 | ⁵ ⁄%" - 11 | Adapter Screws | 101.7 | 75 | | | | | | | | |
| 32 - 100 | 1¼ - 4 | ¹ ⁄4" - 20 | A2D/S6B/S6A Screws | 10.9 | 8 | | | | | | | | |
| 125 - 150 | 5 - 6 | ³ ⁄4" - 10 | Valve Seat Assembly | 101.7 | 75 | | | | | | | | |
| 10, 13 or 20 | 3%, 1⁄2 or 3⁄4 | ⁷ / ₁₆ " - 14 | Flange Bolt for Disc Strainer | 38.0 | 28 | | | | | | | | |
| 32 - 50 | 1¼ - 2 | ⁵⁄«" - 11 | Flange Bolt | 24.3 | 85 | | | | | | | | |
| 65 - 75 | 2 ½ - 3 | ³ ⁄4" - 10 | 3/4" - 10 Flange Bolt 142.4 | | | | | | | | | | |
| 100 | 100 4 ⁷ / ₈ " - 9 | | Flange Bolt | 203.4 | 150 | | | | | | | | |
| 125 - 150 | 5 - 6 | ³ ⁄4" - 10 | Flange Bolt 101.7 75 | | | | | | | | | | |

PARKER-HANNIFIN CORPORATION

OFFER OF SALE

1. <u>Definitions</u>. As used herein, the following terms have the meanings indicated.

| Buyer: | means | any | customer | receiving | а |
|-------------|---------|-----|----------|-----------|---|
| Quote for P | roducts | 5. | | | |
| | | | | | |

- Goods: means any tangible part, system or component to be supplied by Seller.
- Products: means the Goods, Services and/or Software as described in a Quote.
- Quote: means the offer or proposal made by Seller to Buyer for the supply of Products.
- Seller: means Parker-Hannifin Corporation, including all divisions and businesses thereof.
- Services: means any services to be provided by Seller.
- Software: means any software related to the Goods, whether embedded or separately downloaded.
- Terms: means the terms and conditions of this Offer of Sale.

2. Terms. All sales of Products by Seller are expressly conditioned upon, and will be governed by the acceptance of, these Terms. These Terms are incorporated into any Quote provided by Seller to Buyer. Buyer's order for any Products whether communicated to Seller verbally, in writing, by electronic data interface or other electronic commerce, shall constitute acceptance of these Terms. Seller objects to any contrary or additional terms or conditions of Buyer. Reference in Seller's order acknowledgement to Buyer's purchase order or purchase order number shall in no way constitute an acceptance of any of Buyer's terms or conditions of purchase. No modification to these Terms will be binding on Seller unless agreed to in writing and signed by an authorized representative of Seller.

3. Price; Payment. The Products set forth in the Quote are offered for sale at the prices indicated in the Quote. Unless otherwise specifically stated in the Quote, prices are valid for thirty (30) days and do not include any sales, use, or other taxes or duties. Seller reserves the right to modify prices at any time to adjust for any raw material price fluctuations. Unless otherwise specified by Seller, all prices are EXW Seller's facility (INCOTERMS 2020). All sales are contingent upon credit approval and full payment for all purchases is due thirty (30) days from the date of invoice (or such date as may be specified in the Quote). Unpaid invoices beyond the specified payment date incur interest at the rate of 1.5% per month or the maximum allowable rate under applicable law.

4. Shipment; Delivery; Title and Risk of Loss. All delivery dates are approximate, and Seller is not responsible for damages resulting from any delay. Regardless of the manner of shipment, delivery occurs and title and risk of loss or damage pass to Buyer, upon placement of the Products with the carrier at Seller's facility. Unless otherwise agreed prior to shipment and for domestic delivery locations only, Seller will select and arrange, at Buyer's sole expense, the carrier and means of delivery. When Seller selects and arranges the carrier and means of delivery, freight and insurance costs for shipment to the designated delivery location will be prepaid by Seller and added as a separate line item to the invoice. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's acts or omissions. Buyer shall not return or repackage any Products without the prior written authorization from Seller, and any return shall be at the sole cost and expense of Buyer.

5. <u>Warranty</u>. The warranty for the Products is as follows: (i) Goods are warranted against defects in material or workmanship for a period of twelve (12) months from the date of delivery or 2,000 hours of use, whichever occurs first; (ii) Services shall be performed in accordance with generally accepted practices and using the degree of care and skill that is ordinarily exercised and customary in the field to which the Services pertain and are warranted for a period of six (6) months from the date of completion of the Services; and (iii) Software is only warranted to perform in accordance with applicable specifications provided by Seller to Buyer for ninety (90) days from the date of delivery or, when downloaded by a Buyer or end-user. from the date of the initial download. All prices are based upon the exclusive limited warranty stated above, and upon the following disclaimer: EXEMPTION CLAUSE; DISCLAIMER OF WARRANTY, CONDITIONS, REPRESENTA-TIONS: THIS WARRANTY IS THE SOLE AND ENTIRE WARRANTY, CONDITION, AND REPRESENTATION, PERTAINING TO PRODUCTS. SELLER DISCLAIMS ALL OTHER WARRANTIES. CONDITIONS. AND REP-**RESENTATIONS, WHETHER STATUTORY, EXPRESS OR IMPLIED. INCLUDING BUT NOT LIMITED TO** THOSE RELATING TO DESIGN, NONINFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICU-LAR PURPOSE. SELLER DOES NOT WARRANT THAT THE SOFTWARE IS ERROR-FREE OR FAULT-TOL-ERANT, OR THAT BUYER'S USE THEREOF WILL BE SECURE OR UNINTERRUPTED. UNLESS OTHER-WISE AUTHORIZED IN WRITING BY SELLER, THE SOFTWARE SHALL NOT BE USED IN CONNECTION WITH HAZARDOUS OR HIGH RISK ACTIVITIES OR ENVIRONMENTS. EXCEPT AS EXPRESSLY STATED HEREIN, ALL PRODUCTS ARE PROVIDED "AS IS".

6. <u>Claims; Commencement of Actions</u>. Buyer shall promptly inspect all Products upon receipt. No claims for shortages will be allowed unless reported to Seller within ten (10) days of delivery. Buyer shall notify Seller of any alleged breach of warranty within thirty (30) days after the date the non-conformance is or should have been discovered by Buyer. Any claim or action against Seller based upon breach of contract or any other theory, including tort, negligence, or otherwise must be commenced within twelve (12) months from the date of the alleged breach or other alleged event, without regard to the date of discovery.</u>

7. LIMITATION OF LIABILITY. IN THE EVENT OF A BREACH OF WARRANTY, SELLER WILL, AT ITS OP-TION, REPAIR OR REPLACE THE NON-CONFORMING PRODUCT, RE-PERFORM THE SERVICES, OR RE-FUND THE PURCHASE PRICE PAID WITHIN A REA-SONABLE PERIOD OF TIME. IN NO EVENT IS SELLER LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING ANY LOSS OF REVENUE OR PROFITS, WHETHER BASED IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE PAID FOR THE PRODUCTS.

8. <u>Confidential Information</u>. Buyer acknowledges and agrees that any technical, commercial, or other confidential information of Seller, including, without limitation, pricing, technical drawings or prints and/ or part lists, which has been or will be disclosed, delivered or made available, whether directly or indirectly, to Buyer ("Confidential Information"), has been and will be received in confidence and will remain the property of Seller. Buyer further agrees that it will not use Seller's Confidential Information for any purpose other than for the benefit of Seller.

9. Loss to Buyer's Property. Any tools, patterns, materials, equipment or information furnished by

Buyer or which are or become Buyer's property ("Buyer's Property"), will be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer ordering the Products manufactured using Buyer's Property. Furthermore, Seller shall not be responsible for any loss or damage to Buyer's Property while it is in Seller's possession or control.

10. Special Tooling. "Special Tooling" includes but is not limited to tools, jigs, fixtures and associated manufacturing equipment acquired or necessary to manufacture Goods. Seller may impose a tooling charge for any Special Tooling. Such Special Tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in the Special Tooling, even if such Special Tooling has been specially converted or adapted for manufacture of Goods for Buyer and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller has the right to alter, discard or otherwise dispose of any Special Tooling or other property owned by Seller in its sole discretion at any time.

11. <u>Security Interest</u>. To secure payment of all sums due from Buyer, Seller retains a security interest in all Products delivered to Buyer and, Buyer's acceptance of these Terms is deemed to be a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect Seller's security interest.

12. User Responsibility. Buyer, through its own analysis and testing, is solely responsible for making the final selection of the Products and assuring that all performance, endurance, maintenance, safety and warning requirements of the application of the Products are met. Buyer must analyze all aspects of the application and follow applicable industry standards, specifications, and any technical information provided with the Quote or the Products, such as Seller's instructions, guides and specifications. If Seller provides options of or for Products based upon data or specifications provided by Buyer, Buyer is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products. In the event Buyer is not the end-user of the Products, Buyer will ensure such end-user complies with this paragraph.

13. Use of Products, Indemnity by Buyer. Buyer shall comply with all instructions, guides and specifications provided by Seller with the Quote or the Products. Unauthorized Uses. If Buyer uses or resells the Products in any way prohibited by Seller's instructions, guides or specifications, or Buyer otherwise fails to comply with Seller's instructions, guides and specifications, Buyer acknowledges that any such use, resale, or non-compliance is at Buyer's sole risk. Further, Buyer shall indemnify, defend, and hold Seller harmless from any losses, claims, liabilities, damages, lawsuits, judgments and costs (including attorney fees and defense costs), whether for personal injury, property damage, intellectual property infringement or any other claim, arising out of or in connection with: (a) improper selection, design, specification, application, or any misuse of Products; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns. tools, equipment, plans, drawings, designs, specifications or other information or things furnished by Buyer; (d) damage to the Products from an external cause, repair or attempted repair by anyone other than Seller, failure to follow instructions, guides and specifications provided by Seller, use with goods not provided by Seller, or opening, modifying, deconstructing, tampering with or repackaging the

Products; or (e) Buyer's failure to comply with these Terms. Seller shall not indemnify Buyer under any circumstance except as otherwise provided in these Terms.

14. <u>Cancellations and Changes</u>. Buyer may not cancel or modify, including but not limited to movement of delivery dates for the Products, any order for any reason except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage and any additional expense. Seller, at any time, may change features, specifications, designs and availability of Products.

15. Limitation on Assignment. Buyer may not assign its rights or obligations without the prior written consent of Seller. 16. Force Majeure. Seller is not liable for delay or failure to perform any of its obligations by reason of events or circumstances beyond its reasonable control. Such circumstances include without limitation: accidents, labor disputes or stoppages, government acts or orders, acts of nature, pandemics, epidemics, other widespread illness, or public health emergency, delays or failures in delivery from carriers or suppliers, shortages of materials, war (whether declared or not) or the serious threat of same, riots, rebellions, acts of terrorism, fire or any reason whether similar to the foregoing or otherwise. Seller will resume performance as soon as practicable after the event of force majeure has been removed. All delivery dates affected by force majeure shall be tolled for the duration of such force majeure and rescheduled for mutually agreed dates as soon as practicable after the force majeure condition ceases to exist. Force majeure shall not include financial distress, insolvency, bankruptcy, or other similar conditions affecting one of the parties, affiliates and/or sub-contractors.

17. <u>Waiver and Severability</u>. Failure to enforce any provision of these Terms will not invalidate that provision; nor will any such failure prejudice either party's right to enforce that provision in the future. Invalidation of any provision of these Terms shall not invalidate any other provision herein and, the remaining provisions will remain in full force and effect.

18. <u>Termination</u>. Seller may terminate any agreement governed by or arising from these Terms for any reason and at any time by giving Buyer thirty (30) days prior written notice. Seller may immediately terminate, in writing, if Buyer: (a) breaches any provision of these Terms, (b) becomes or is deemed insolvent, (c) appoints or has appointed a trustee, receiver or custodian for all or any part of Buyer's property, (d) files a petition for relief in bankruptcy on its own behalf, or one is filed against Buyer by a third party, (e) makes an assignment for the benefit of creditors; or (f) dissolves its business or liquidates all or a majority of its assets.

19. Ownership of Software. Seller retains ownership of all Software supplied to Buyer hereunder. In no event shall Buyer obtain any greater right in and to the Software than a right in the nature of a license limited to the use thereof and subject to compliance with any other terms provided with the Software.

20. Indemnity for Infringement of Intellectual Property Rights. Seller is not liable for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights ("Intellectual Property Rights") except as provided in this Section. Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on a third party claim that one or more of the Products sold hereunder infringes the Intellectual Property Rights of a third party in the country of delivery of the Products by Seller to Buyer. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of any such claim, and Seller having sole control over the defense of the claim including all negotiations for settlement or compromise. If one or more Products sold hereunder is subject to such a claim. Seller may, at its sole expense and option. procure for Buyer the right to continue using the Products, replace or modify the Products so as to render them non-infringing, or offer to accept return of the Products and refund the purchase price less a reasonable allowance for depreciation. Seller has no obligation or liability for any claim of infringement: (i) arising from information provided by Buyer; or (ii) directed to any Products provided hereunder for which the designs are specified in whole or part by Buyer; or (iii) resulting from the modification, combination or use in a system of any Products provided hereunder. The foregoing provisions of this Section constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for claims of infringement of Intellectual Property Rights.

21. <u>Governing Law.</u> These Terms and the sale and delivery of all Products are deemed to have taken place in, and shall be governed and construed in accordance with, the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of

Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to the sale and delivery of the Products.

22. Entire Agreement. These Terms, along with the terms set forth in the main body of any Quote, forms the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale and purchase. In the event of a conflict between any term set forth in the main body of a Quote and these Terms, the terms set forth in the main body of the Quote shall prevail. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter shall have no effect. These Terms may not be modified unless in writing and signed by an authorized representative of Seller.

23. Compliance with Laws. Buyer agrees to comply with all applicable laws, regulations, and industry and professional standards, including those of the United States of America, and the country or countries in which Buyer may operate, including without limitation the U.S. Foreign Corrupt Practices Act ("FCPA"), the U.S. Anti-Kickback Act ("Anti-Kickback Act"), U.S. and E.U. export control and sanctions laws ("Export Laws"), the U.S. Food Drug and Cosmetic Act ("FDCA"), and the rules and regulations promulgated by the U.S. Food and Drug Administration ("FDA"), each as currently amended. Buyer agrees to indemnify, defend, and hold harmless Seller from the consequences of any violation of such laws. regulations and standards by Buyer, its employees or agents. Buyer acknowledges that it is familiar with all applicable provisions of the FCPA, the Anti-Kickback Act, Export Laws, the FDCA and the FDA and certifies that Buyer will adhere to the requirements thereof and not take any action that would make Seller violate such requirements. Buyer represents and agrees that Buyer will not make any payment or give anything of value, directly or indirectly, to any governmental official, foreign political party or official thereof, candidate for foreign political office, or commercial entity or person, for any improper purpose, including the purpose of influencing such person to purchase Products or otherwise benefit the business of Seller. Buyer further represents and agrees that it will not receive, use, service, transfer or ship any Products from Seller in a manner or for a purpose that violates Export Laws or would cause Seller to be in violation of Export Laws. Buyer agrees to promptly and reliably provide Seller all requested information or documents, including end-user statements and other written assurances, concerning Buyer's ongoing compliance with Export Laws.

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Safe Operation (See 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 increases 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 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.

Warranty

All Refrigerating Specialties products are under warranty against defects 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 the 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 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 including any warranty of merchantability, or fitness for a particular purpose. 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.

WARNING - USER RESPONSIBILITY

Failure or improper selection or improper use of the products 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 or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors. To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

For safety information see the Safety Guide at www.parker.com/safety or call 1-800-CParker.

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319551RSD ECN: 0372541 02/2023





GAS POWERED SUCTION STOP VALVE

Type CK-2

Port Size: 32mm to 150mm (1¼" - 6") FOR AMMONIA, R12, R22, R502 AND OTHER COMMON REFRIGERANTS

FEATURES

- Low Pressure Drop
- Heavy Return Spring
- Manual Opening Stem
- Use in Vertical or Horizontal Line
- Normally Open
- 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, cast iron bodied valves are built with control valve precision. All are equipped with flanges and manual lift stem. The 32mm (11/4") port size has a PTFE main seat; 40mm (1-5/8") port and larger have a metal to metal seat.





Purpose

These special valves are used on low temperature applications to positively close suction lines and both liquid legs and gas returns on flooded evaporators. Because of the spring, no line pressure drop is required to open the valve; therefore, on suction line applications pressure drop is nominal; on flooded evaporators normal gravity circulation is unrestricted. Being pressure powered to close, this valve can overcome sticking at low temperatures caused by the presence of viscous oil.

Principles of Operation

For closing of the CK-2, condenser gas pressure or pressure from another source is admitted to the inlet on top of #1 Piston. The gas pressure acting on the #1 Piston forces the piston down, compressing #2 Spring, firmly seating on the valve seat bead. The valve will not close unless pressure above the piston exceeds the downstream pressure by at least 0.35 bar (5 psi). For opening the CK-2 Valve the remote pressure source must be closed. The higher pressure above #1 Piston will equalize through the piston bleed hole to the lower pressure downstream of main valve allowing #2 Spring to open valve fully. The valve will not open until pressure above the piston is equalized with the downstream pressure after de-energizing, or closing, of the pilot solenoid valve.

Service Pointers

1. Failure to close: (a) Pilot solenoid is not opening due to low voltage or solenoid coil burnout. (b) Dirt lodged between #1 Valve Piston and cylinder wall (disassemble and remove all dirt and burrs). (c) Manual lift stem is turned in, thereby mechanically holding the #1 Piston up. (d) Strainer/Disc in Pilot Line Flanges may be plugged (Remove and clean). (e) Pilot pressure source is not high enough; must be at least 0.35 bar (5 psi) above the main valve downstream pressure.

2. Failure to open: (a) Pilot solenoid is not closing because its manual lift stem is turned in. (b) Dirt lodged between #1 Valve Piston and cylinder wall. (Disassemble and remove all dirt and burrs). (c) #2 Spring may be broken (replace spring). (d) Pressures between remote pressure source and main valve downstream pressures are not equalizing. Check for leakage through the pilot solenoid valve. Check for backward installation of CK-2 preventing equalization with downstream pressure.

3. Leakage through valve when closed: (a) There are dirt or chips under the Piston Main Valve. Disassemble valve and clean thoroughly. (b) PTFE main valve disc, on valve size 32mm (11/4") port, may be damaged enough to permit leakage. (Disassemble valve and replace #1 Piston Main Valve). On metal to metal seated valves replace entire Piston Main Valve assembly and lap grind piston face into valve and seat bead if necessary.

1

Refrigerating Specialties Division

| REPAIR KITS FOR CK2 | 32-150mm (1¼" - 6") |
|---------------------|---------------------|
| | · · · · · |

| ITEM NO. | DESCRIPTION | OTY. | 32mm (1-1/4") | 40mm (1-5/8") | 50mm (2") | 65mm (2-1/2") | 75mm (3") | 100mm (4") | 125mm (5") | 150mm (6") |
|---------------|---|-------------|------------------|------------------|--------------|------------------|--------------|---------------|---------------|---------------|
| 5 4 | PISTON PLUG ASM COVERGASKET | 1 | | | | | | | | |
| 4.5 | PISTON PLUG KIT | | 201205 | 201140 | 201139 | 201117 | 201121 | 201226 | 201227 | 202491 |
| 11 10 9 | MAN. OP G STEM FLAT WASHER STEM PACKING | 1 1 1 | | | | | | | | |
| 11, 10, 9 | OPENING STEM KIT | | 201514 | 201133 | 201133 | 201118 | 201216 | 201213 | 202363 | 202364 |
| 3 | TOP COVER | 1 | | | | | | | | |
| 3.4 | COVER KIT | | 200669 | 200673 | 200673 | 200690 | 200676 | 200677 | 200678 | 200681 |
| 6 7 | SEAL CAP GASKET | 1 1 | | | | | | | | |
| 6.7 | SEAL CAP KIT | | 202110 | 202110 | 202110 | 202144 | 202111 | 202111 | 202111 | 202111 |
| 8 | PACKING NUT | 1 | | | | | | | | |
| 10, 9, 8 | PACKING KIT | | 202100 | 202100 | 202100 | 202100 | 202101 | 202101 | 202101 | 202101 |
| 22 | OPENING SPRING | 1 | 301528 | 301490 | 301490 | 301494 | 301505 | 301500 | 310511 | 310534 |
| | FLANGE GASKET | 2 | | | | | | | | |
| 15 | FLANGE GSKT PKG. | 12 | 202080 | 202081 | 202081 | 202082 | 202083 | 202084 | | |
| | FLANGE GSKT PKG. | 2 | | | | | | | 202085 | 202086 |
| | COVER SCREW | 8 | 202541 | 202540 | 202540 | 202540 | | | 202538 | |
| 2 | COVER SCREW | 6 | | | | | 202252 | 202252 | | |
| | COVER SCREW | 10 | | | | | | | | 202539 |
| 18 17 | BOTTOM GASKET BOTTOM CAP | 1 1 | | | | | | | | |
| 18, 17 | BOTTOM CAP KIT | | | | | | | | 200724 | 200755 |
| 16 | BOTTOM CAP BOLT | 6 | | | | | | | 202250 | |
| | | 8 | | | | | | | | 202539 |
| 39 | DISC STRAINER ASM | 1 | | SI | EE NOTE BEL | WC | | | | |

NOTE: ITEM #39 PILOT LINE DISC STRAINER ASSEMBLY IS AVAILABLE IN THE FOLLOWING CONNECTION STYLES: 3/8" FPT, SW & WN; 1/2" FPT, SW & WN; 3/4" FPT, SW, & WN; 3/8 ODS & 7/8 ODS. 3/8" FPT WILL BE SUPPLIED UNLESS OTHERWISE SPECIFIED.







| | DIMENSIONAL DATA | | | | | | | | | | | | | | | | | | |
|-----------|-------------------|-------|-------|-------|------|-------|------|-------|------|-------|------|-------|------|-----|------|------|------|----|------|
| PORT SIZE | | А | | В | | c | | 1 | D | | E | | F | Ģ | 3 | н | | 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 | 1 ⁵ /8 | 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 | 21⁄2 | 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 | 108.3 | 7.1 | 294.6 | 11.6 | 706.1 | 27.8 | 617 | 24.3 | 35.6 | 1.4 | _ | _ |







Manual Lift Stem

If it is desired to hold open the CK-2 check valve manually, remove #6 Sealing Cap (See Fig. 3) and turn #11 Seat Lifting Stem inward as far as possible. Valve cannot close now until the #11 Seat Lift Stem is once again turned out.

Installation

Protect inside of valve from dirt and chips during installation. The CK-2 Suction Stop Valve may be installed on its side or vertically upright in either vertical or horizontal pipe lines. When used on suction lines, the arrow on the valve body should point in the direction of normal fluid flow. When used on either gas or liquid legs of a flooded evaporator, the arrow on the valve body should point from the evaporator to the surge drum. The Type S6N Pilot Solenoid Valve should be located as close to the CK-2 Suction Stop Valve as possible in order to minimize the volume of high pressure gas to be relieved through the internal bleed port of the CK-2, upon termination of the defrost cycle and to assure a more rapid and positive opening of the CK-2 Suction Stop Valve.

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 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, EXPRESS 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.

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.



SOLENOID VALVES

Type S4W, S9W

Port Size: 125-200mm (5"- 8") FOR AMMONIA, R-12, R-22, R-502 AND OTHER COMMON REFRIGERANTS

FEATURES

- Cast Steel Body-Strong, Light Weight.
- Welds Directly In The Line-No Flanges.
- Removable Seat-Serviceable From Top Side.
- Pilot Operated
- Single Coil Size-Same As Most Other R/S Valves.
- Design Pressure (MRP):27.6 bar (400 psig)
- Maximum Opening Pressure Difference (MOPD): 21 bar (300 psig)
- Manual Opening Stem
- PTFE Pilot Seat
- Streamlined Fluid Flow Pattern
- Pilot Solenoid Parts Are Same As Used With Most Other R/S Solenoids.





Description

These heavy duty, cast steel bodied (ASTM No. A352 Grade LCB), spring closing solenoid valves weld directly in the line and do not require flanges. They are for control of Ammonia, R-12, R-22 and R-502, other common refrigerants, certain oils and other fluids approved for use in refrigeration valves.

The Type S4W are pilot operated valves using upstream pressure for the moving force, and require a minimum 0.21 bar (3 psi) pressure drop to fully open. The Type S9W also are pilot operated valves 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 for the Type S9W must be at least 0.71 bar (10 psi) above valve internal upstream pressure for positive opening. Both valve types are normally closed.

It is advisable to install a strainer upstream of each S4W valve to prevent entrance of foreign material into the valve and the rest of the system. The Type RSW strainer can be welded directly to the Type S4W inlet. A strainer is not required upstream of a Type S9W valve.

Purpose

TYPE S4W is suitable to stop or start flow in refrigerant hot gas, liquid or suction lines in a temperature range of -45° to 105° C (-50° to 220° F). If used in a liquid line, precautions should be taken to prevent hydraulic shock which is possible when flow of a substantial quantity of liquid is suddenly stopped.

TYPE S9W is most frequently used in a low temperature suction line in which pressure drops must be kept to a minimum. They can also be used in hot gas or liquid lines, provided there is always a refrigerant pressure available in the system for external pressure operation of the valve that is 0.71 bar (10 psi) above the valve upstream pressure. The fluid temperature range for the S9W is -45° to 105°C (-50° to 220°F).

The powerful opening and closing action of the S9W valve enables it to overcome viscous oil or minor dirt conditions which might jam a conventional solenoid valve when used on a very low temperature suction line.

Principles of Operation

TYPE S4W

The valve in its closed position, with the solenoid coil de-energized and the plunger-needle and main port plug in the seated position is shown in the drawing at the left. Electrical energization of the solenoid coil forms a magnetic field, pulling up the plunger which strikes the needle, lifting it off its seat. Upward motion of the needle permits entrance of the fluid from the valve inlet M through Port N and down through the pilot port to the top of the power piston. This forces the piston downward and pushes the main port plug open, thereby permitting flow of the refrigerant through the valve. The closing spring meanwhile is held in a compressed position.

De-energization of the solenoid coil permits the spring-assisted needle to drop back into its seat, stopping the flow through the pilot port. Bleed-off, through the bleed hole in the piston, decreases the pressure above the piston and allows the closing spring to force the main port plug upward into a closed position to stop the flow. The pressure difference across the valve, acting upon the area of the valve seat, plus the force of the closing spring, holds the main port plug in a tightly closed position.



TYPE S9W

For opening of the S9W main valve, the Pressure Pilot Solenoid Valve is electrically energized to open (Admitting high pressure gas to Chamber A at the top of the power piston); simultaneously, the Bleed Pilot Solenoid Valve is electrically de-energized (preventing escape of the high pressure gas entering Chamber A); thereby the pressure acting on the power piston forces the main valve wide open.

For closing of the S9W main valve, the reverse actions take place. The Pressure Solenoid is electrically de-energized to close (preventing further high pressure gas f rom reaching Chamber A at the top of the power piston); simultaneously, the Bleed Solenoid is electrically energized to

open (bleeding off pressure from Chamber A); thereby the main valve is caused to close by the force of the valve closing spring.

Manual Opening Stem

The manual opening stems on the Types **S4W** and **S9W** are for the purpose of opening the valve without energizing the solenoid coil. Refer to the applicable cross-section drawing for location of the stem and other related parts. For access to each stem the seal cap on the top of the valve must be removed. This must be done with caution as refrigerant may have been trapped inside the seal cap. Manual opening is accomplished by turning the stem clockwise until only the flats on the end of the stem protrude from the packing nut. To reset for automatic operation turn the stem counterclockwise as far as it goes.

Repair Kits for Type S4W and S9W Solenoid Valves

| Item | Description | 125mm (5") | Q S4W | ty S9W | 150mm (6") | Q S4W | ty S9W | 200mm (8") | Q S4W | ty S9W | Item | Description | 125mm (5") | C S4W | ty S9W | 150mm (6") | Qt S4W S | y S9W | 200mm (8") | Qt S4W | y S9W |
|----------|-------------------------|-----------------------|----------|-----------|-----------------------|----------|--------------|----------------------|----------|--------------|----------|-----------------------------------|---------------|----------|-----------|---------------|-------------|----------|---------------|-----------|----------|
| 1 | Body, Valve | Not available | 1 | 1 | Not available | 1 | 1 | Not available | 1 | 1 | 32 | Body.S6N | Not available | - | 2 | Not available | - 1 | 2 | Not available | - | 2 |
| | | separately | | | separately | | | separately | | | | (Includes Name Plate) | separately | | | separately | | | separately | | |
| | | | | | | | | | | | 33 | Stem, Manual Opening | Only with Kit | - | 2 | Only with Kit | - | 2 | Only with Kit | - | 2 |
| 2 | Seat, Valve | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | 34 | Washer | Only with Kit | - | 2 | Only with Kit | - | 2 | Only with Kit | - | 2 |
| 3 | O-Ring, Seat | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | 35 | Packing, Stem | Only with Kit | - | 2 | Only with Kit | - | 2 | Only with Kit | - | 2 |
| 4 | Screw, Retaining | Only with Kit | | | Only with Kit | | | Only with Kit | | | 30 | Nut, Packing Stom Kit, Opening | Only with Kit | - | | Only with Kit | - | 2 | Only with Kit | - | 2 |
| 5 | Wrench Seat | Only with Kit | | | Only with Kit | | | Only with Kit | | | 33-30 | Stem Kit, Opening | 201631 | - | 2 | 201631 | - | 2 | 201631 | - | 2 |
| 2-6 | Seat Kit | 201534 | | | 201535 | li | li | 201536 | li | | 3/ | Gaskel | Only with Kit | - | 2 | Only with Kit | - | 2 | Only With Kit | - | 2 |
| 7 | Plug. Modulating | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | 37-38 | Can Kit | 201145 | | 2 | 201145 | | 2 | 201145 | | 2 |
| 8 | Spring, Compression | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | 39 | Elange Kit (2 Eigs only) | 200001 | - | 3 | 200001 | - | 3 | 200001 | - | 3 |
| 2-8 | Plug Kit - S4W | 201537 | 1 | 1 | 201538 | 1 | 1 | 201539 | 1 | 1 | 40 | Rolt | Only with Kit | | 2 | Only with Kit | - | 2 | Only with Kit | | 2 |
| 2-8 | Plug Kit - S9W | 201691 | 1 | 1 | 201692 | 1 | 1 | 201693 | 1 | 1 | 41 | Bolt | Only with Kit | | 2 | Only with Kit | | 2 | Only with Kit | | 2 |
| 9 | Piston Stem Assembly | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | 42 | Nut | Only with Kit | - | 4 | Only with Kit | - | 4 | Only with Kit | - | 4 |
| 10 | Ring, Seal | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | 43 | Gasket | Only with Kit | - | 5 | Only with Kit | - | 5 | Only with Kit | - | 5 |
| 5,9,10 | Piston Kit - S4W | 201540 | 1 | - | 201541 | 1 | - | 201542 | 11 | - | 40-43 | Bolt Kit | | | | | | | | | |
| 5,98, 10 | PISION KIL - S9W | 201543 | - | 1 | 201544 | - | 1 | 201545 | - | 1 | 40.42 | (S6N without Strainer | 201290 | - | 1 | 201290 | - | 1 | 201290 | - | 1 |
| 12 | Nut Packing | Only with Kit | | | Only with Kit | | | Only with Kit | | | 40-43 | BOIL KIL (SAN with Stainer) | 201287 | | 1 | 201287 | | 1 | 201287 | | 1 |
| 12 | Packing, Stem | Only with Kit | | | Only with Kit | | | Only with Kit | | | 20 27 42 | Cackot Kit | 201207 | - | 2 | 201207 | - | 2 | 201207 | | 12 |
| 14 | Washer, Packing | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | 27,37,43 | Dilat Value Assembly | 201032 | - | 2 | 201032 | - | 2 | 201032 | - | 2 |
| 5,11-14 | Stem Kit, Opening | 201546 | 1 | 1 | 201547 | 1 | 1 | 201548 | 1 | 1 | 28-38,43 | Pliot valve Assembly | 100990 | - | 2 | 100990 | - | 2 | 100990 | | 12 |
| 15 | Seal Cap | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | 44 | Body, Strainer | NOL AVAIIADIE | - | ' | Notavaliable | - | 1 | NOL available | - | 11 |
| 16 | Gasket | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | 45 | Cackat | Oply with Kit | | 1 | Only with Kit | | 1 | Only with Kit | - | 1 |
| 15-16 | Cap Kit,Seal | 201549 | 1 | 1 | 201550 | 1 | 1 | 201551 | 1 | 1 | 45 | Basket | Only with Kit | | | Only with Kit | | 1 | Only with Kit | | |
| 17 | Bolt, Hex Head | Only with Kit | 6 | 6 | Only with Kit | 10 | 10 | Only with Kit | 16 | 16 | 47 | Сар | Only with Kit | - | 1 | Only with Kit | - | 1 | Only with Kit | - | 1 |
| 10 | Nuls | Only with Kit | 2 | - | Only with Kit | 12 | 12 | Uniy with Kit | 10 | 10 | 45-47 | Basket, Kit | 200136 | - | 1 | 200136 | - | 1 | 200136 | - | 1 |
| 5,17-19 | Bolt Kit | 201552 | 1 | 1 | 201553 | 1 | 1 | 201554 | 1 | 1 | 48 | Pipe Nipple | 302014 | - | 3 | 302014 | - | 3 | 302014 | - | 3 |
| 20 | Gasket (Bonnet) | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | Only with Kit | 1 | 1 | 49 | Pipe Nipple with Orifice | 200999 | - | 1 | 200999 | - | 1 | 200999 | - | 1 |
| 3,5,10, | | - | | | | | | - | | | 50 | Tee | 302083 | - | 1 | 302083 | - | 1 | 302083 | - | 1 |
| 16-20 | Gasket Kit | 201558 | 1 | 1 | 201559 | 1 | 1 | 201560 | 1 | 1 | 51 | Gasket | Only with Kit | - | 2 | Only with Kit | - | 2 | Only with Kit | - | 2 |
| 21 | Adapter, S4W | 301244 | 1 | - | 301244 | 1 | - | 301244 | 1 | - | 52 | Screen Assembly | Only with Kit | - | | Only with Kit | | 1 | Only with Kit | - | |
| 22 | Knob | Only with Kit | 1 | 2 | Only with Kit | 1 | 2 | Only with Kit | 1 | 2 | 51-52 | Screen Assembly Kit | 200912 | - | | 200912 | - | 1 | 200912 | - | +- |
| 23 | O-Ringl | Only with Kit | 1 | 2 | Only with Kit | 1 | 2 | Only with Kit | | 2 | 52 | Boll | Only with Kit | - | 2 | Only with Kit | - | 2 | Only with Kit | - | 2 |
| 22, 23 | Coil Assombly SAW | 205237 Soo Dart No | | 2 | 205237 Soo Dart No | | 2 | 205237 SooDart No | | 2 | 53-54 | Bolt Kit | 201672 | | | 201672 | | 1 | 201672 | | 1 |
| 24 | Coll Assembly, 34W | Page4 | l' | 2 | Page 4 | 1' | ² | Page 4 | 1' | ² | 55 | Cover Top | 201072 | - | 1 | 202545 | - | 1 | 202545 | - | 1 |
| 28 | Tube Assembly | Only with Kit | 1 | 2 | Only with Kit | 1 | 2 | Only with Kit | 1 | 2 | 56 | O-Ring | Only with Kit | - | 1 | Only with Kit | - | 1 | Only with Kit | +- | 1 |
| 29 | Gasket | Only with Kit | 1 | 2 | Only with Kit | 1 | 2 | Only with Kit | 1 | 2 | 57 | Insert Seal | Only with Kit | - | 1 | Only with Kit | _ | 1 | Only with Kit | - | 1 |
| 28-29 | Tube Kit | 201036 | 1 | 2 | 201036 | 1 | 2 | 201036 | 1 | 2 | 56-57-20 | Insert Seal Kit | 202333 | - | 1 | 202333 | - | 1 | 202333 | - | 1 |
| 30 | Plunger Needle Assembly | Only with Kit | 1 | 2 | Only with Kit | 1 | 2 | Only with Kit | 1 | 2 | 58 | Plug, Pipe | 302011 | 1 | 1 | 302011 | 1 | 1 | 302011 | 1 | 1 |
| 31 | Seat Assembly | Only with Kit | 1 | 2 | Only with Kit | 1 | 2 | Only with Kit | 1 | 2 | 5-13-20 | | | | | | | | | | 1 |
| 29-31 | Plunger Seat Kit | 201630 | 1 | 2 | 201630 | 1 | 2 | 201630 | 1 | 2 | 58-59 | Adapter Cover | 202861 | 1 | 1 | 202484 | 1 | 1 | 203099 | 1 | 1 |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | 1 | | | | | | | | | | | | 1 |
| | | | | | | | | | 1 | | | | | | | | | | | | 1 |

Dimensions







2

| Dime | nsion | 125mm (5") | 150mm (6") | 200mm (8") | | |
|------|-------|---------------|---------------|---------------|--|--|
| ~ | mm | 451 | 527 | 584 | | |
| ~ | inch | 17.75 | 20.75 | 23.00 | | |
| в | mm | 114 | 152 | 197 | | |
| Б | inch | 4.50 | 6.00 | 7.75 | | |
| C | mm | 597 | 673 | 730 | | |
| 0 | inch | 23.50 | 26.50 | 28.75 | | |
| ц | mm | 565 | 679 | 781 | | |
| | inch | 22.25 | 26.75 | 30.75 | | |
| ĸ | mm | 711 | 825 | 927 | | |
| ĸ | inch | 28.00 | 32.50 | 36.50 | | |
| | mm | 381 | 483 | 622 | | |
| - | inch | 15.00 | 19.00 | 24.50 | | |
| w | mm | 267 | 318 | 381 | | |
| | inch | 10.50 | 12.50 | 15.00 | | |







Installation

It is necessary that all installation personnel read and become familiar with the Refrigerating Specialties Division Refrigeration Safety Bulletin (RSB) before installing any valves.

All valves are packed for maximum protection during storage and shipment. Read the enclosed literature and save it for reference after installing the valve.

Do not remove the protective covers from the inlet and outlet of the valve until ready to install. They protect the interior from dirt and other foreign matter.

Select a location for installation where the valve will be easily accessible for adjustment and maintenance. Avoid locations where the valve may be damaged by personnel, traffic, material handling or other equipment.

Before installing the valve, check to see that all chips, scale, dirt and other foreign material are removed from the pipes; also be sure the arrow on the S4W valve body is pointing in the flow direction. (See paragraph below concerning Type S9W). Remove the protective covers from the valve.

Type S4W valve must be mounted in a horizontal pipeline with the solenoid at the top and in a vertical position as shown on page 1.

Type S9W valve can be mounted in any position except upside down. The remote pilot solenoids, however, must be mounted in a vertical position with the solenoid at the top as shown on page 1.

There are some applications in which an S9W in a horizontal line will function better if installed lying on its side. For example, in a liquid overfeed suction line. The internal partitions of the valve body that separate the inlet side from the outlet side, create a higher wall (or dam) which will tend to block flow of liquid refrigerant and/or oil, if the valve is in an upright position, than if on its side. Especially in low temperature suction lines, where the velocities tend to be slower, an S9W lying on its side will offer less resistance to flow than one in an upright position, because the valve inlet throat will not be choked with as much liquid.

The Type S9W Main Valve Body should normally be installed with the arrow on the body pointing in the direction of normal fluid flow through the valve. However, when installed in gravity liquid or gas legs between a flooded evaporator and its surge drum, as part of a defrost control system, the arrow should always point from the evaporator to the surge drum.

The Pilot Solenoid Valve assembly may be located anywhere within approximately 8 meters (25 feet) of the Main Valve Body, provided pipe connections are extended to the Main Valve Body as well as to condenser gas and compressor suction lines. The standard Pilot Solenoid Valve assembly is built for installation on top of the Main Valve Body; therefore, remote or altered location of the Pilot Solenoid Valve assembly requires slight revisions in the field to the 3/8" pilot valve assembly piping.

After installation, check the valve and the welded joints for external leaks with refrigerant or other appropriate gas before putting the system into operation.

If the valve is to be insulated, be sure to allow access to the manual opening stem and strainer. Do not insulate the coil and coil housing.

Connect the solenoid lead wires to an electrical supply source as indicated on the valve coil. The power source must be capable of supplying full, constant voltage. The wires, to which the solenoid leads are connected, must be of the proper gauge.

Electrical

The Refrigerating Specialties Division molded water resistant 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. (D.C. requires special solenoid construction.) 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 10 pressure differential. Power consumption during normal operation will be 33 watts or less.

Inrush and running current is listed below:

| | Inrush | Running | Fuse |
|------------------------------|---------------|---------|--------|
| Standard Coil | Current | Current | Size |
| Volts/Hertz | (Amps) | (Amps) | (Amps) |
| 120/60 (Blue leads) | 1.18 | 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 Fact | tory) | |
| | | | |

On transformer coil the 6 volt leads are always black.

Caution: Do not connect the solenoid lead wires to the loadside circuit of a motor or other high current device. Doing this may cause the solenoid and motor or other device to become energized simultaneously and produce a voltage drop, resulting in the valve's failure to open. A more desirable condition would be to connect the solenoid on a separate circuit or to install a time delay on the heavy load solenoid valve circuit. This would prevent energization of the solenoid until the circuit's full power is restored.

Warranty

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, 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, EXPRESS OR IMPLIED, WRITTEN OR ORAL, INCLUDING ANY WARRANTY OF 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.

SAFE OPERATION (see also Bulletin RSBCV)

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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 for S9W pilot solenoids with ODS connections are not suitable for ammonia service.



GAS POWERED SUCTION STOP VALVE

Type S9A

Port Size: 50-100mm (2" - 4") FOR AMMONIA, R12, R22, R502 AND OTHER COMMON REFRIGERANTS

FEATURES

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

Description

This heavy duty gas powered valve is suitable for Ammonia, R-12, R-22, and R-502, 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 S9A 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 for the Type S9A must be at least 0.69 bar (10 psi) above valve internal upstream pressure for positive opening. This valve is normally closed.





March 2002 Installation, Service and Parts Information

Purpose

The S9A valve is designed to promptly and fully open or close under conditions which make conventional solenoid valves unreliable or unsuitable, such as viscous oil conditions, location in a vertical pipeline, or where very low valve pressure drop is required.

The S9A valve is a two-position valve using condenser gas pressure acting upon a piston for opening, and a strong spring for closing. A lapped seat at the top of the piston prevents the condenser gas from leaking around the piston to the compressor suction side of the valve. A twin Pilot Solenoid Valve assembly serves to admit condenser gas pressure to the piston for opening and to bleed this gas pressure to the suction line for valve closing. A single-pole, double throw thermostat or relay may be used to control these two Pilot Solenoid Valves.

The S9A is not a check valve and will permit reverse flow if the downstream pressure is higher than the upstream pressure.

Principles of Operation

For opening of the S9A main valve, the Pressure Pilot Solenoid Valve is electrically energized to open (admitting high pressure gas to chamber A (Fig. 1) at the top of the power piston); simultaneously, the Bleed Pilot Solenoid Valve is electrically de-energized (preventing escape of the high pressure gas entering chamber A); thereby the pressure acting on the piston forces the main valve wide open.

For closing of the S9A main valve, the reverse actions take place. The Pressure Solenoid is electrically de-energized to close (preventing further high pressure gas from reaching chamber A at the top of the piston); simultaneously, the Bleed Solenoid is electrically energized to open (bleeding off pressure from chamber A); thereby the main valve is caused to close by the force of the valve closing spring.

Manual Opening Stem

To manually open the #2 Main Valve of the S9A Solenoid Valve, cautiously remove #10 Seal Cap and turn #2A Seat Lift Stem out until it stops. Valve cannot close now until the #2A Seat Lift Stem is once again turned in. See Fig. 1.



| REPAIR KITS FOR TYPE S9A | | | | | | | | | |
|--------------------------|----------------------------|------|-----------|-------------|-----------|-----------|--|--|--|
| Item No. | Description & Contents | Oty. | 50mm (2") | 65mm(21/2") | 75mm (3") | 100mm(4") | | | |
| 2 | Plug/Stem Asm. | 1 | | | | | | | |
| * | Spring Kit, Closing | 1 | | | | | | | |
| 8 | Packing Packing Stem | 1 | | | | | | | |
| 6 | Washer, Flat | 1 | | | | | | | |
| 2,6-8 | Plug Kit, Main Valve | | 202209 | 202210 | 202211 | 202212 | | | |
| 5 | Spring, Comp | 1 | | | | | | | |
| 25 | Wiper, Dirt | 1 | | | | | | | |
| 3 | Gasket | | | | | | | | |
| 24 | Washer, Flat | 1 | 000000 | 000007 | 202200 | 202200 | | | |
| 3,5,24,25 | Wesher Elet | 1 | 202306 | 202307 | 202306 | 202309 | | | |
| 8 | Nut Packing | | | | | | | | |
| 7 | Packing Stem | 1 | | | | | | | |
| 6-8 | Packing Kit, Stem | | 202100 | 202100 | 202101 | 202101 | | | |
| | Stem Packing Pkg. | | | | | | | | |
| 7 | (0.28" I.D.) | | 202478 | 202478 | 202479 | 202479 | | | |
| | Packing | 25 | | | | | | | |
| 10 9 | Seal Cap Gasket | | | | | | | | |
| 9-10 | Cap Kit, Seal | | 202110 | 202110 | 202111 | 202111 | | | |
| 13 | Cover, Top | 1 | | | | | | | |
| 12 | Gasket | 1 | | | | | | | |
| 12-13 | Cover Kit | | 201150 | 201163 | 201144 | 201135 | | | |
| 11 12 | Piston/Stem Asm. Gasket | 1 | | | | | | | |
| 11-12 | Piston Kit | | 201072 | 201074 | 201076 | 200276 | | | |
| 11 | Piston/Stem Asm. | 1 | | | | | | | |
| 12 | Gasket | 1 | | | | | | | |
| 11-12 | Piston Kit 9A | | 202126 | 202127 | 202128 | 202129 | | | |
| | Plug Kit, Main Valve | 1 | | | | | | | |
| 4 | Cover, Bottom | | | | | | | | |
| 15 | Bolt. Hex Head | 6 | | | | | | | |
| 10 | Seal Cap | 1 | | | | | | | |
| 4,9,10,15 | Bottom Asm. Kit | | 202358 | 202360 | 202361 | 202362 | | | |
| 52 | Strainer, Disc | 1 | | | | | | | |
| 51 | Gasket | 2 | | | | | | | |
| 51,52 | Strainer Kit, Disc | | 200912 | 200912 | 200912 | 200912 | | | |
| 5 | Spring Comp (Only) | 1 | 301557 | 301558 | 301559 | 301500 | | | |
| 48 | Pipe Nipple 3/8" x 2" | 1 | 302014 | 302014 | 302014 | 302014 | | | |
| 52 | Strainer, Disc | | | | | | | | |
| 39 | Flange 3/8" FPT | 2 | | | | | | | |
| 53 | Bolt | 2 | | | | | | | |
| 54 | Nut | 2 | | | | | | | |
| 39,51,52 | Strainer, Disc with 3/8" | T | | | | | | | |
| 53,54 | FPT Figs. | | 201665 | 201665 | 201665 | 201665 | | | |
| 3 | Gasket, Bottom Cap, Pkg. | 6 | 202374 | 202374 | 202382 | 202383 | | | |
| 26 | Gasket, Flange, PKg. | 12 | 202081 | 202082 | 202083 | 202084 | | | |
| 3,9,12,26 | | | 202287 | 202288 | 202289 | 202290 | | | |
| 49 | | 1 | 200998 | 200999 | 200999 | 200999 | | | |
| 14 | Cover Bolt Pkg | 0 | 302073 | 302073 | 302073 | 302073 | | | |
| 14 | Cover boil Fky. | 6 | 202341 | 202041 | 202546 | 202547 | | | |
| 15 | Bottom Cap Bolt Pkg | 6 | 202251 | 202251 | 202040 | 202047 | | | |
| 10 | Bottom Cap Boil Fkg. | 0 | 202201 | 202201 | 202202 | 202232 | | | |

| | | | | DIMENS | IONAL DATA (Se | e Fig. 2) | | | |
|----------|-------|---------|-----------|--------|----------------|-----------|-------|------------|------------|
| PORT S | IZE | | 50mm (2") | | 65mm | (2-1/2") | 75r | nm (3") | 100mm (4") |
| DIMENS | ION | | | | | · · | | | |
| ۸ | MM | | 429 | | 4 | 55 | 57 | 0 | 615 |
| ~ | INCH | | 16.9 | | 17 | '.9 | 22 | .4 | 24.2 |
| в | MM | | 175 | | 18 | 30 | 26 | 69 | 292 |
| В | INCH | | 6.9 | | | .1 | 10 | .6 | 11.5 |
| C | MM | | 251 | | 2 | 51 | 31 | 1 | 366 |
| C | INCH | | 9.9 | | 9 | .9 | 12 | .2 | 14.4 |
| D | MM | | 307 | | 33 | 31 | 38 | 39 | 450 |
| (FPT,SW) | INCH | | 12.1 | | 13 | 3.0 | 15 | .3 | 17.7 |
| | CONN. | 1-1/2 | | 2 | 2- | 1/2 | 3 | 3 | 4 |
| E | MM | 364 371 | | 40 | 01 | 47 | '8 | 571 | |
| (WN) | INCH | 14.3 | | 14.6 | 15 | 5.8 | 18 | .8 | 22.5 |
| | 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 |
| F | MM | 358 | 338 | 358 | 348 | 389 | 414 | 432 | 503 |
| (ODS) | INCH | 14.1 | 13.3 | 14.1 | 13.7 | 15.3 | 16.3 | 17 | 19.8 |
| G | MM | | 251 | | 3 | 14 | 31 | 4 | 363 |
| Ŭ | INCH | | 9.9 | | 12 | 2.4 | 12 | .4 | 14.3 |
| н | MM | | 140 | | 1: | 59 | 17 | ' 6 | 222 |
| | INCH | | 5.5 | | 6 | 6.2 | | 0 | 8.8 |
| .1 | MM | | 254 | | 2 | 74 | 30 | 00 | 323 |
| 5 | INCH | | 10.0 | | 10 |).8 | 11 | .8 | 12.7 |
| | 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 |
| N | MM | 28 | 33 | 38 | 38 | 43 | 43 | 48 | 55 |
| (ODS) | INCH | 1.1 | 1.3 | 1.5 | 1.5 | 1.7 | 1.7 | 1.9 | 2.2 |
| P | MM | | 15 | | 25 | | 29 | | 32 |
| (SW) | INCH | | 0.60 | | 1 | .0 | 1. | 10 | 1.3 |





Installation

It is necessary that all installation personnel read and become familiar with the Refrigerating Specialties Division Refrigeration Safety Bulletin (RSB) before installing any valves.

All valves are packed for maximum protection during storage and shipment. Read the enclosed literature and save it for reference after installing the valve.

Do not remove the protective covers from the inlet and outlet of the valve until ready to install. They protect the interior from dirt and other foreign matter.

Select a location for installation where the valve will be easily accessible for adjustment and maintenance. Avoid locations where the valve may be damaged by personnel, traffic, material handling or other equipment.

Before installing the valve, check to see that all chips, scale, dirt and other foreign material are removed from the pipes. Remove the protective covers from the valve.

Type S9A valve can be mounted in any position except upside down. The remote pilot solenoids, however, must be mounted in a vertical position with the solenoid at the top as shown on page 3.

There are some applications in which an S9A in a horizontal line will function better if installed lying on its side. For example, in a liquid overfeed suction line: The internal partitions of the valve body that separate the inlet side from the outlet side create a higher wall (or dam) which will tend to block flow of liquid refrigerant and/or oil if the valve is in an upright position instead of on its side. Especially in low temperature suction lines, where the velocities tend to be slower, an S9A lying on its side will offer less resistance to flow than one in an upright position, because the valve inlet throat will not be choked with as much liquid.

The Type S9A Main Valve Body should normally be installed with the arrow on the body pointing in the direction of normal fluid flow through the valve. However, when installed in gravity liquid or gas legs between a flooded evaporator and its surge drum, as part of a defrost control system, the arrow should always point from the evaporator to the surge drum.

The Pilot Solenoid Valve assembly may be located anywhere within approximately 8 meters (25 feet) of the Main Valve Body, provided pipe connections are extended to the Main Valve Body as well as to condenser gas and compressor suction lines. The standard Pilot Solenoid Valve assembly is built for installation on top of the Main Valve Body; therefore, remote or altered location of the Pilot Solenoid Valve assembly requires slight revisions in the field to the 3/8" pilot valve assembly piping.

After installation, check the valve and the welded joints for external leaks with refrigerant or other appropriate gas before putting the system into operation.

If the valve is to be insulated, be sure to allow access to the manual opening stem and strainer. Do not insulate the coil and coil housing.

Connect the solenoid lead wires to an electrical supply source as indicated on the valve coil. The power source must be capable of supplying full, constant voltage. The wires, to which the solenoid leads are connected, must be of the proper gauge.

Electrical

The Refrigerating Specialties Division molded water resistant 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) | 1.18 | 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 |
| 230150 (Yellow leads) | 0.65 | 0.26 | 1 |
| Other | Consul | t Factory | |

On transformer coil the 6 volt leads are always black.

Caution: Do not connect the solenoid lead wires to the loadside circuit of a motor or other high current device. Doing this may cause the solenoid and motor or other device to become energized simultaneously and produce a voltage drop, resulting in the valve's failure to open. A more desirable condition would be to connect the solenoid on a separate circuit or to install a time delay on the solenoid valve circuit. This would prevent energization of the solenoid until the circuit's full power is restored.

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 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. EXPRESS OR IMPLIED, WRITTEN OR ORAL, INCLUDING ANY WARRANTY OF 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.

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 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.

