SPX®
WHERE IDEAS MEET INDUSTRY

INSTRUCTION MANUAL

Trip-L-Trap®

Automatic Condensate Drains
Models 505 and 506

FORM NO.: 4011237 REVISION: 04/2014

READ AND UNDERSTAND THIS MANUAL PRIOR TO OPERATING OR SERVICING THIS PRODUCT.

Model 505

Model 506

Hankison®

CONTENTS

I. GENERAL SAFETY INFORMATION

CAUTION

A. Pressurized devices
This equipment is a pressure containing device.

- Do not exceed maximum operating pressure as shown on equipment serial number tag.
- Make sure equipment is depressurized before working on or disassembling it for servicing.

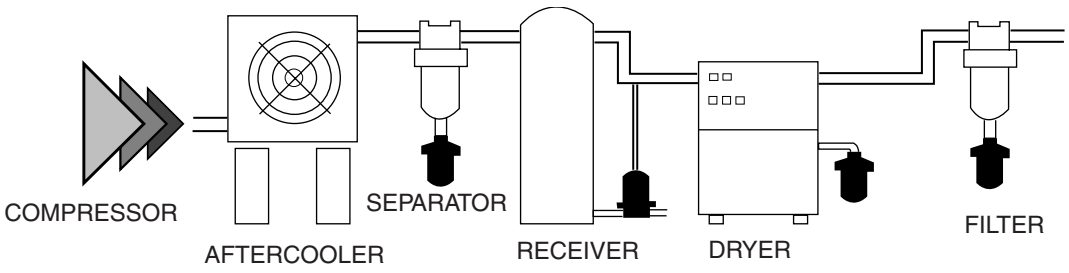
B. During each operation of the drain a small amount of system gas is discharged to atmosphere through the bleed hole in the piston cylinder.

- Where hazardous or explosive gases are present in the system, provisions for safe disposal of the discharge must be provided.

II. DESCRIPTION

These drains are a pilot actuated, pneumatically operated, automatic liquid drain device for use in discharging collected liquids from a compressed air system. It is recommended for use with air receivers, drip legs, aftercoolers, separators, dryers, and filters.

Typical compressed air system



III. INSTALLATION

IMPORTANT:
DO NOT use a wrench on the valve body of the drain. Tighten using wrench flats on top of drain only. The valve body should never be turned once it is installed. If it is turned, the float arm may become restricted and will not operate.

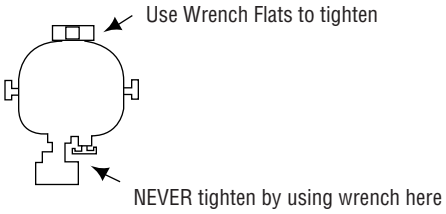


FIGURE 1

A. Preparation:
- **1.** All Models: Remove inlet and drain thread protectors.
- **2.** Bottom Connection Models: Bushing and compression fitting are shipped loose in carton. Install these items in fitting on top of drain before installation. Refer to Figure 2.

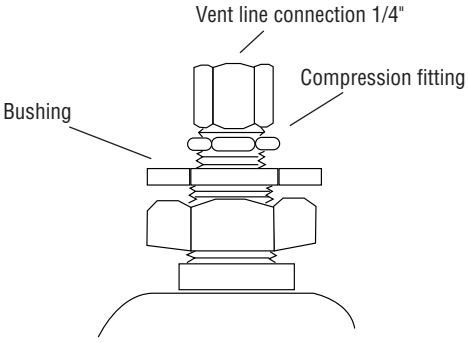


FIGURE 2
Bottom Connection Models Only

B. Install drain vertically to ensure proper float operation.

C. Connections:
- **1.** Inlet line
  - **a.** Inlet line should slope downwardly to drain inlet to allow condensate to flow into the drain by gravity.
  - **b.** Strainers to protect the drain from undue particulate contamination and isolation valves to permit quick and easy drain servicing are useful additions to the inlet line.
  - **c.** The inlet pipe to the drain should not be smaller than the inlet connection so that drainage is not restricted (avoid piping "pockets").
- **2.** Drain Line
  While it is not always necessary, a drain line is normally recommended in order to keep condensate from spraying into the area in front of the discharge port.
  NOTE: In many cases condensate contains oil. Check regulations in your area for proper disposal methods for oil contaminated condensate
  - **a.** Tubing (min. 3/8" O.D.) or piping (min. 1/4") may be run from the drain connection (1/4" FPT) to an adequate sump or floor drain, preferably below the level of the drain.
  - **b.** Do not put a valve in the drain line or obstruct the discharge of the condensate in any way (such as with severe bending of drain line).
  - **c.** Drain discharges condensate at system pressure; the drain line should be anchored to prevent movement.
- **3.** Vent Line
  Vent lines are required on all bottom connection drains and on top connection drains only where upward sloping inlet lines form a water trap.
  - **a.** Bottom connection drains: Bottom inlet connection drains must be vented by running 1/4" O.D. tubing from the compression fitting on the top of the drain to a place in the system where there is pressure equal to the pressure in the device being drained. See Figure 3.
  - **b.** Top connection drains: It is normally not necessary to vent top connection drains. See Figure 4. However, if an upward sloping drain line is unavoidable, a vent line is necessary. See Figure 5.

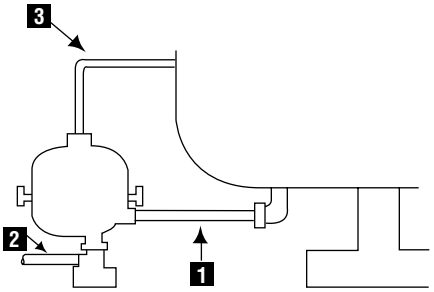


FIGURE 3

Installation of Bottom Connection Drains
1. Inlet Line
2. Drain Line
3. Vent Line

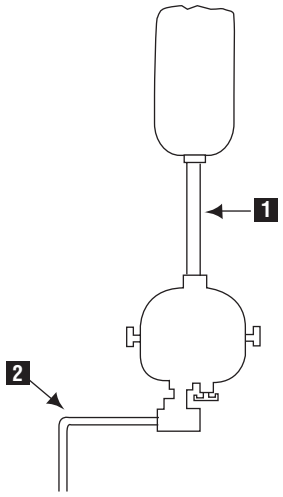


FIGURE 4

Normal Installation for Top Connection Drains
1. Inlet Line
2. Drain Line

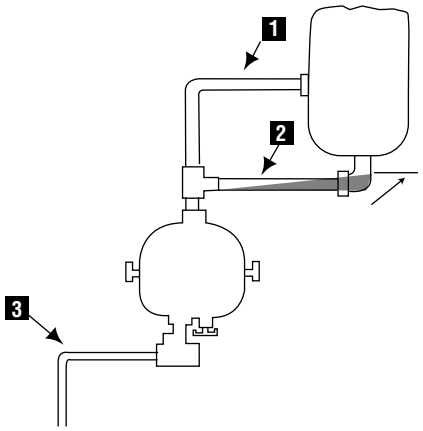


FIGURE 5

Installation for Top Connection drains with upward sloping drain lines only
1. Vent line
2. Inlet Line
3. Drain Line

IV. ENGINEERING DATA

Models	505 505BC	505HP 505BCHP	505SS 505BCSS	505HPSS 505BCHPSS	506 506BC	506HP 506BCHP	506SS 506BCSS	506HPSS 506BCHPSS
Min./ Max. Operating Pressure psig	10/300	10/500	10/300	10/500	10/300	10/500	10/300	10/500
bar	.69/21	.69/35	.69/21	.69/35	.69/21	.69/35	.69/21	.69/35
Min./ Max. Operating Temperature °F	35/150	35/150	35/150	35/150	35/150	35/150	35/150	35/150
°C	1.7/65.6	1.7/65.6	1.7/65.6	1.7/65.6	1.7/65.6	1.7/65.6	1.7/65.6	1.7/65.6
Primary Materials of Construction Shell	Carbon Steel		304 Stainless Steel		Carbon Steel		304 Stainless Steel	
Internals	Mechanical Parts: Steel, Stainless Steel, Brass, Delrin, Nylon; Viton Seals		Mechanical Parts: Stainless Steel; Viton Seals		Mechanical Parts: Steel, Stainless Steel, Brass, Delrin, Nylon; Viton Seals		Mechanical Parts: Stainless Steel; Viton Seals	
Discharge per Operation	190 cc 0.4 pints		190 cc 0.4 pints		1514 cc 3.2 pints		1514 cc 3.2 pints	
Nominal Capacity*	190 cc/min. 11.4 liters/hr. 3 gallons/hr.		190 cc/min. 11.4 liters/hr. 3 gallons/hr.		1514 cc/min. 90.8 liters/hr. 24 gallons /hr.		1514 cc/min. 90.8 liters/hr. 24 gallons /hr.	
Max. Capacity*	1140 cc/min. 68.4 liters/hr. 18 gallons/hr.		1140 cc/min. 68.4 liters/hr. 18 gallons/hr.		9084 cc/min. 544.8 liters/hr. 144 gallons/hr.		9084 cc/min. 544.8 liters/hr. 144 gallons/hr.	

*Drains are designed to operate at one discharge per minute for one year before servicing is required. Operation at more than one discharge per minute may require more frequent servicing.

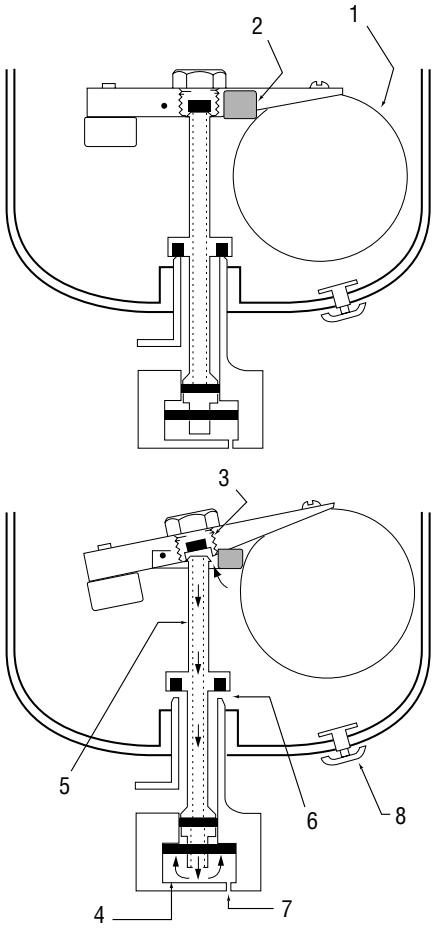
V. OPERATION

Positive discharge of condensate without loss of air.

LEVEL ACTUATED, PILOT CONTROLLED. . .
As condensate collects in the drain housing, a float **(1)** is held firmly in place by a magnet **(2)**. When the condensate level rises sufficiently, the buoyancy of the float overcomes the holding force of the magnet and the pilot valve **(3)** trips open.

POWER OPERATED. . .
When the pilot valve opens, compressed air enters air cylinder **(4)**, forcefully moving piston **(5)**, which opens a large discharge port **(6)**. Condensate is then forced out of the discharge port. After the condensate has been discharged, the float drops and pilot valve **(3)** closes. Compressed air in piston cylinder **(4)** bleeds off through bleed hole **(7)**. Air pressure in the housing then moves piston **(5)** the opposite way, closing the discharge port and holding it securely shut until the next operation.

All models can be manually drained and depressurized through manual drain **(8)**.



VI. MAINTENANCE

A. Regular maintenance of the condensate discharge drain is recommended. Flush out accumulated sludge and dirt by opening manual drain valve about once a month.

B. Disassemble and service at least once a year. Drains are designed to operate at one discharge per minute for one year before servicing is required. Operation at more that one discharge per minute may require more frequent servicing. (NOTE: Before starting the servicing procedure, make sure you have a Repair Parts Kit on hand).

1. Close valve ahead of drain.

2. Depressurize drain by opening manual drain valve (31).

3. Disconnect drain lines.

4. Figure 7 - Remove nuts (28) and bolts (27) and separate top and bottom shell assemblies. Remove seal ring retainer (24) and case seal ring (29). Figure 6 illustrates o-ring and ring retainer for carbon steel models.

5. To rebuild drain mechanism, refer to Figure 7.

a. Remove six screws (14) from piston cylinder (13) and remove cylinder.

b. Remove nut (19) and lock washer (11) from bottom of valve stem assembly. For carbon steel models remove piston disc (9 & 10), piston seal (8), and key washer (7) from valve stem assembly. For stainless steel models piston is a single piece.

c. Remove valve stem assembly (3) from valve body (2) by lifting valve stem assembly upwards.

d. Remove retainer clip (36) and pivot pin (17) and lift float arm assembly (15) off of valve stem assembly (3).

e. Remove pilot valve screw assembly (18) from float arm assembly and replace with a new assembly from the repair parts kit. Reassemble float arm assembly to valve stem assembly using new pivot pin and retainer clip from repair parts kit.

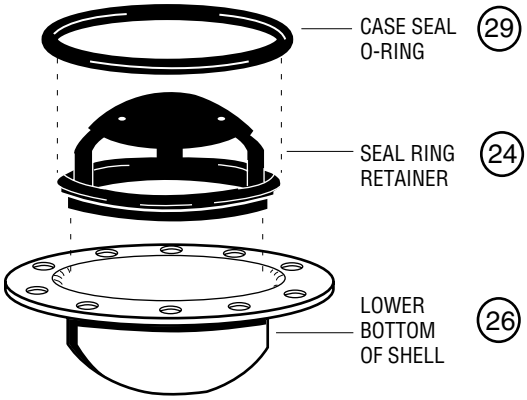
f. Remove valve sleeve (5) from valve stem assembly and replace valve disc (4) with new disc from repair parts kit.

g. Replace sleeve seal ["V" ring] (6) on valve sleeve making sure "V" shape is in the same position as shown in Figure 7 - Detail A on drawing.

h. Reassemble valve sleeve to valve stem assembly as shown in drawing . Lubricate sleeve seal with lubricant supplied with repair parts kit or silicone grease. Insert complete valve stem assembly into valve body. On models 506SS make sure rod on valve stem assembly is inserted into hole on inside of shell as shown in Figure 6 - Detail C.

i. Reassemble piston, and piston seal ["V" ring] (8) using new parts from repair parts kit. On stainless steel models re-use the original stainless steel piston disc.

j. Reassemble key washer (7), piston assembly, lock washer (11), and nut (19) to valve stem assembly. Make sure "V" shape of piston seal is in the same position as shown in Figure 8 - Detail B and that the key on the key washer is in the hole (37) directly opposite drain connection on valve body.



CARBON STEEL MODELS

FIGURE 6

k. Lubricate piston seal and piston cylinder wall with lubricant supplied in repair parts kit or silicone grease.

l. Reassemble piston cylinder (13) to valve body with six screws (14). Make sure bleed hole (38) in piston cylinder is not plugged up, as this will cause the drain to stick in the open position. Raise and lower valve assembly to make sure it operates freely.

m. On carbon steel models place seal ring retainer (24) into bottom shell assembly (26) making sure that end of float arm assembly with counterweight (20) is positioned in open area of seal ring retainer. For models 506, 506BC and 506HP make sure rod on top of float assembly fits into hole in seal ring retainer as shown in Figure 6 - Detail D.

n. Before reassembling shell, make sure float mechanism moves freely up and down.

o. On carbon steel models position new case seal ring (29) ABOVE the small lip on the seal ring retainer. On stainless steel models place new case seal ring into groove in seal ring retainer.

p. Reassemble bottom shell to top shell.

q. Reconnect drain lines, close manual drain valve.

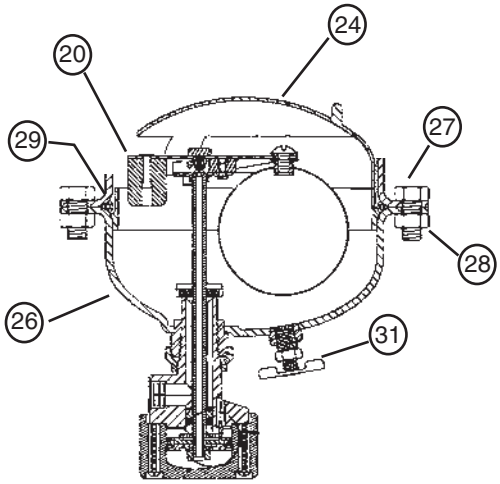
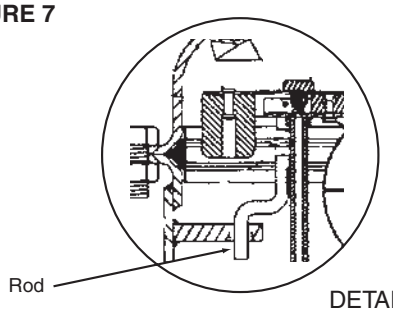
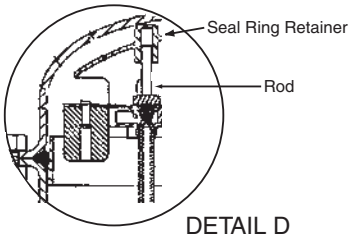


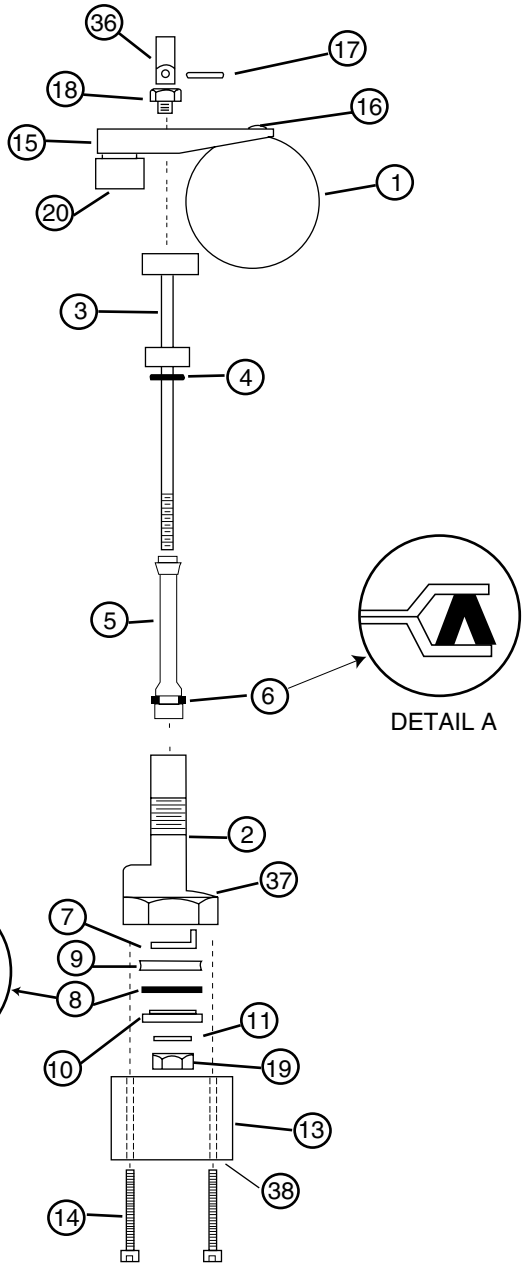
FIGURE 7



DETAIL C



DETAIL D



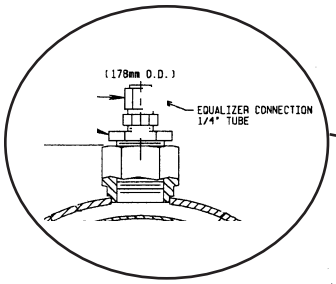
DETAIL A

DETAIL B

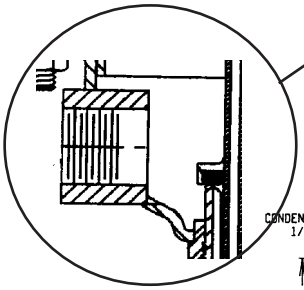
Bleed hole not shown

FIGURE 8

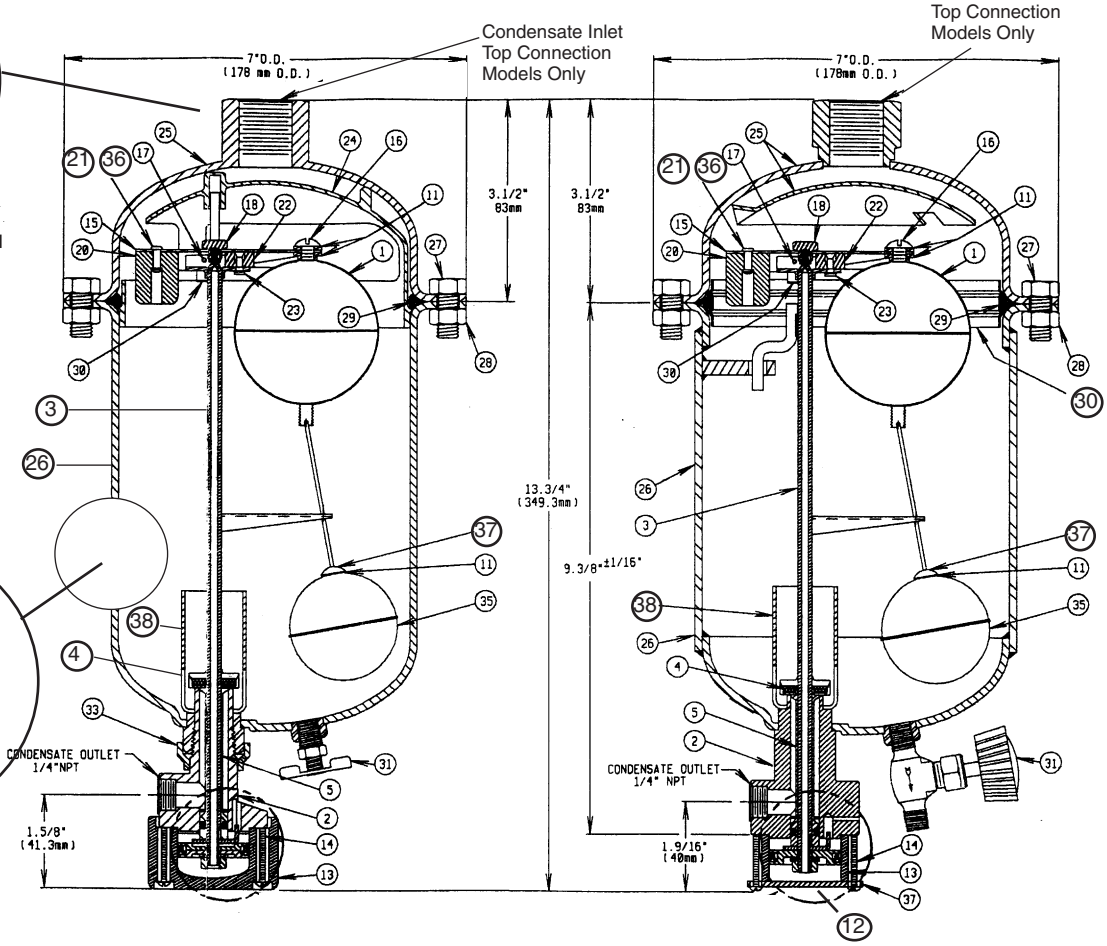
DIMENSIONAL DRAWINGS



VENT LINE CONNECTION
BOTTOM CONNECTION
MODELS ONLY

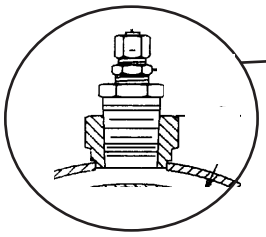


CONDENSATE INLET
BOTTOM CONNECTION
MODELS ONLY

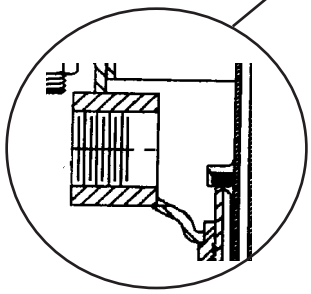


MODELS 506, 506HP,
506BC, & 506BCHP

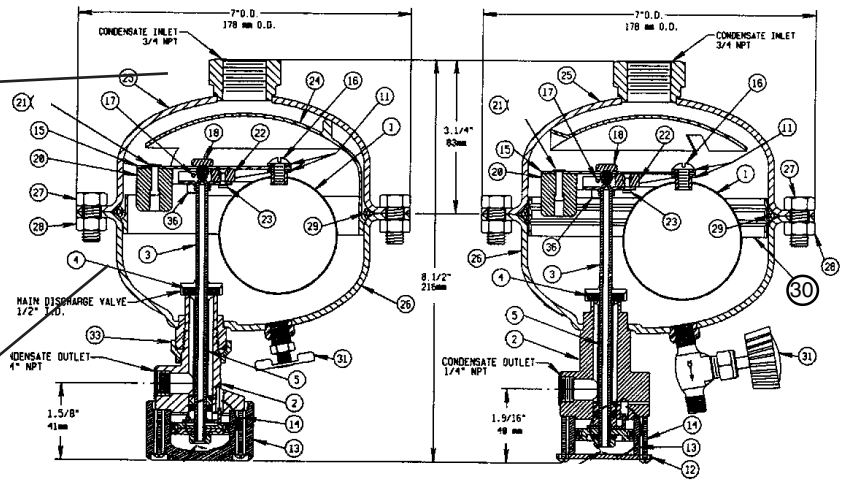
MODELS 506SS, 506SSHP,
506SSBC & 506SSBCHP



VENT LINE CONNECTION
BOTTOM CONNECTION
MODELS ONLY



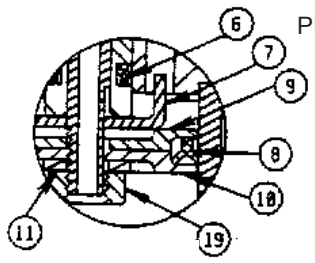
CONDENSATE INLET
BOTTOM CONNECTION
MODELS ONLY



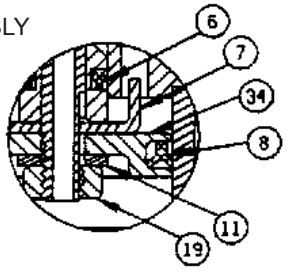
MODELS 505, 505HP,
505BC & 505BCHP

MODELS 505SS, 505SSHP,
505SSBC & 505SSBCHP

PISTON ASSEMBLY



STANDARD MODELS



STAINLESS STEEL MODELS

VII. REPLACEMENT PART NUMBERS

			MODELS			
PC. NO.	NAME	NO. REQ'D.	505 505BC 505HP 505BCHP	505SS 505BCSS 505HPSS 505BCHPSS	506 506BC 506HP 506BCHP	506SS 506BCSS 506HPSS 506BCHPSS
1	Float (3)	1	3223828	3223828	3244801	3244801
2	Valve Body	1	3232348	4011390	3232348	4011390
3	Valve Stem (4)	1	—	—	—	—
4	Valve Disc (1)	1	4011527	4011527	4011527	4011527
5	Valve Sleeve	1	3230658	4011388	3230658	4011388
6	Sleeve Seal (1)	1	4011525	4011525	4011525	4011525
7	Key Washer	1	4011405	4011405	4011405	4011405
8	Piston Seal (1)	1	4011526	4011526	4011526	4011526
9	Piston Disc Female (1) (5)	1	—	N/A	—	N/A
10	Piston Disc Male (1) (5)	1	—	N/A	—	N/A
11	Lock Washer (3)	3	4010333	4010333	4010333	4010333
12	Cylinder Head	1	N/A	4012552	N/A	4012552
13	Piston Cylinder	1	3240684	4006961	3240684	4006961
14	Cylinder Screws	6	3228388	4010150	3228388	4010150
15	Float Arm (3)	1	—	—	—	—
16	Float Screw (3)	1	4010157	4010157	4010157	4010157
17	Pivot Pin (1)	1	4010342	4010342	4010342	4010342
18	Pilot Valve Screw Assembly (1)	1	4001775	4001775	4001775	4001775
19	Hexagon Nut	1	4010298	4010298	4010298	4010298
20	Counterweight (3)	1	—	—	—	—
21	Counterweight Rivet (3)	1	—	—	—	—
22	Magnet (4)	1	—	—	—	—
23	Magnet Pin (4)	1	—	—	—	—
24	Baffle & Seal Ring Retainer	1	4011528	N/A	3228355	N/A
25	Shell Case Assy. (Top)	1				
	Models 505, 505SS, 506, 506SS		4001791	4001792	4001791	3230615
	Models 505BC, 505BCSS, 506BC, 506BCSS		4001791	4001792	4001791	4001792
	Models 505HP, 505HPSS, 506HP, 506HPSS		3230613	7500062	3230613	3230616
	Models 505BCHP, 505BCHPSS, 506BCHP, 506BCHPSS		3230613	7500062	3230613	3234780
26	Shell Case assy. (Bottom)	1				
	Models 505, 505SS, 506, 506SS		4001779	4001780	4001784	4001785
	Models 505BC, 505BCSS, 506BC, 506BCSS		3230610	3230612	4001787	4001788
	Models 505HP, 505HPSS, 506HP, 506HPSS		3230606	4001782	3230608	4001786
	Models 505BCHP, 505BCHPSS, 506BCHP, 506BCHPSS		3230611	4001790	3230609	4001789
27	Flange Bolt (2)	10	4010110	4010116	4010110	4010116
28	Flange Bolt Nut (2)	10	4010288	4010296	4010288	4010296
29	Case Seal Ring (1)	1	4011524	4011524	4011524	4011524
30	Seal Ring Retainer	1	N/A	4001776	N/A	4001776
31	Drain Valve	1				
	Models 505, 505SS, 505HPSS, 506, 506SS, 506HPSS		7400597	4010024	7400597	4010024
	Models 505HP, 506HP		4010027	—	4010027	—
33	Thread Shield	1	3228421	—	3228421	—
34	Piston	1	N/A	4011764	N/A	4011764
35	Bottom Float	1	N/A	N/A	4010444	4010444
36	Retainer Clip (1)	1	4010419	4010419	4010419	4010419
37	Connecting Wire & Screw Assy.	1	N/A	N/A	4001766	4001766
38	Skim Tube Assy.	1	N/A	N/A	3231080	4006960

NA - Not Available

(1) These parts are included in Repair Parts Kit 6000003.

(2) HP models require 20.

(3) These parts are furnished as part of Float Arm Assembly (parts 1, 11 & 16 are also furnished separately); 505 Series models use assy. no. 3252383; 506 Series models use assy. no. 3223829.

(4) These parts are furnished as part of Valve Stem Assembly; For models 505, 505BC, 505HP, & 505BCHP use assy. no. 3230660; For models 505SS, 505BCSS, 505HPSS, & 505BCHPSS use assy. no. 3241151; For models 506, 506BC, 506HP, & 506BCHP use assy. no. 3230657; For models 506SS, 506BCSS, & 506CHPSS use assy. no. 3223833.

(5) These parts furnished as part of Piston Disc Assembly; For models 505, 505BC, 505HP, 505BCHP, 506BC, 506HP, & 506BCHP use assy. no. 3223475.

(6) This part furnished as part of Top Shell Case Assembly.

VIII. TROUBLESHOOTING GUIDE

Symptom	Possible Cause	Corrective Action
Drain stuck open - Air continuously being discharged.	1. Bleed hole on bottom of piston cylinder obstructed.	1. Use pin to open hole.
	2. Worn seals .	2. Rebuild drain. See Section VI-B.
Drain won't discharge - condensate can be drained through manual drain.	1. Drain being operated below minimum pressure.	1. Increase line pressure above 10 psig (.69 bar)
	2. Air supply through inlet or vent line obstructed.	2. Top connection drains: Slope inlet line downward to avoid water trap or install vent line. Bottom connection drains: Make sure vent line is open. Make sure isolation valves are open.
	3. Drain line obstructed	3. Make sure there are no valves, severe bends, or other obstructions in drain line.
	4. Valve body has been turned causing impairment of float movement.	4. Disassemble and check that float is free to move.
	5. Worn seals	5. Rebuild drain. See Section VI-B.

WARRANTY

The manufacturer warrants the product manufactured by it, when properly installed, operated, applied, and maintained in accordance with procedures and recommendations outlined in manufacturer's instruction manuals, to be free from defects in material or workmanship for a period of one (1) year from the date of shipment to the buyer by the manufacturer or manufacturer's authorized distributor, or eighteen months from the date of shipment from the factory, whichever occurs first, provided such defect is discovered and brought to the manufacturer's attention within the aforesaid warranty period. The manufacturer will repair or replace any product or part determined to be defective by the manufacturer within the warranty period, provided such defect occurred in normal service and not as a result of misuse, abuse, neglect or accident.

The warranty covers parts and labor for the warranty period. Repair or replacement shall be made at the factory or the installation site, at the sole option of the manufacturer. Any service performed on the product by anyone other than the manufacturer must first be authorized by the manufacturer. Normal maintenance items requiring routine replacement are not warranted. Unauthorized service voids the warranty and any resulting charge or subsequent claim will not be paid. Products repaired or replaced under warranty shall be warranted for the unexpired portion of the warranty applying to the original product. The foregoing is the exclusive remedy of any buyer of the manufacturer's product. The maximum damages liability of the manufacturer is the original purchase price of the product or part.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL, OR STATUTORY, **AND IS EXPRESSED IN LIEU OF THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.** THE MANUFACTURER SHALL NOT BE LIABLE FOR LOSS OR DAMAGE BY REASON OF STRICT LIABILITY IN TORT OR ITS NEGLIGENCE IN WHATEVER MANNER INCLUDING DESIGN, MANUFACTURE OR INSPECTION OF THE EQUIPMENT OR ITS FAILURE TO DISCOVER, REPORT, REPAIR, OR MODIFY LATENT DEFECTS INHERENT THEREIN. THE MANUFACTURER, HIS REPRESENTATIVE OR DISTRIBUTOR SHALL NOT BE LIABLE FOR LOSS OF USE OF THE PRODUCT OR OTHER INCIDENTAL OR CONSEQUENTIAL COSTS, EXPENSES, OR DAMAGES INCURRED BY THE BUYER, WHETHER ARISING FROM BREACH OF WARRANTY, NEGLIGENCE OR STRICT LIABILITY IN TORT.

The manufacturer does not warrant any product, part, material, component, or accessory manufactured by others and sold or supplied in connection with the sale of manufacturer's products.

AUTHORIZATION FROM THE SERVICE DEPARTMENT IS NECESSARY BEFORE MATERIAL IS RETURNED TO THE FACTORY OR IN-WARRANTY REPAIRS ARE MADE.

SERVICE DEPARTMENT : (724) 746-1100

Trip-L-Trap®

Automatic Condensate Drains

Models 505 and 506

SPX®

WHERE IDEAS MEET INDUSTRY

SPX

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