



## CUT SHEETS CATALOG

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**L80 PNEUMATIC**



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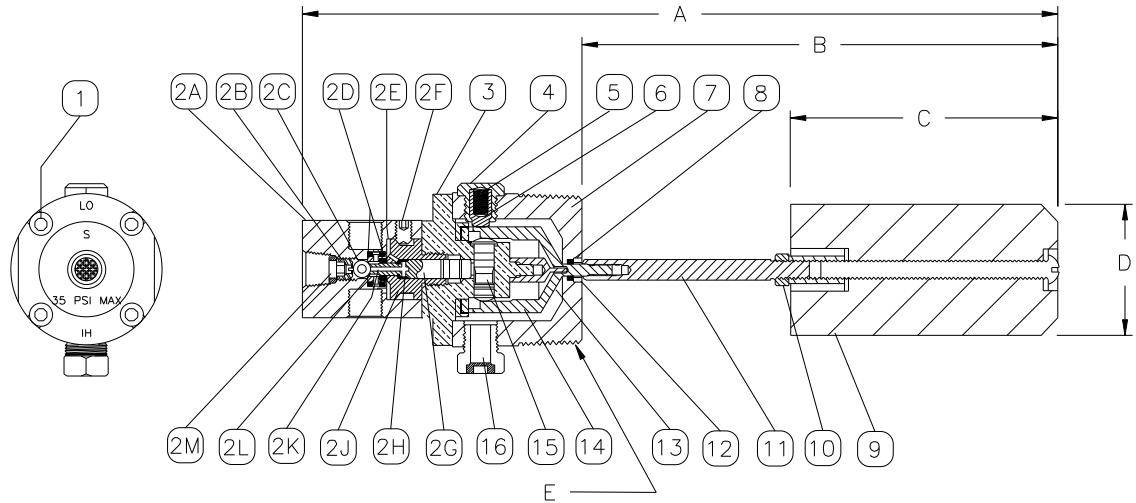


# MODEL L80 PNEUMATIC

The Model L80 switch incorporates a pneumatic 3-way valve, providing positive and fast system response. Its design has a non-adjustable trip point and narrow level operation range making it perfect for applications where trip point tampering is unacceptable. An internal stainless steel supply gas filter reduces maintenance requirements.

## DIMENSIONS in. (mm)

A	11.66 (296)
B	7.35 (187)
C	4.10 (104)
D	2.00 (50)
Weight	3.6 Lbs (1.64 kg)



## Parts List for Level Switch L80

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	PART NO.
1	4	Socket Cap Screw	316 SST	TA-08K-0G3
2	1	Valve Assembly	Detailed Below	88-008-0B0
2A	1	Valve Body	316 SST	80-005-0A0
2B	1	Ball Retainer	18-8 SST	80-024-000
2C	1	Ball	Tungsten Carbide	BL-250-25T
2D	2	Seat O-Ring	Fluorocarbon	V0-012-75H
2E	1	Body O-Ring	Fluorocarbon	V0-019-75H
2F	3	Set Screw	18-8 SST	T9-08K-0C4
2G	1	Valve Stem	316 SST	80-019-000
2H	1	Valve Stem Spring	316 SST	80-035-000
2J	1	Adaptor Head	316 SST	80-004-000
2K	1	Valve Stem O-Ring	Fluorosilicone	FO-008-70T
2L	1	Seat	316 SST	80-006-000
2M	1	Filter Disk	316 SST	80-053-000
3	1	Pivot Body	316 SST	80-017-000
4	1	Spring Cap	316 SST	30-012-000
5	1	Spring	Inconel X-750	30-014-000
6	1	Spring Guide	Acetal	30-008-000
7	1	2" NPT Body	316 SST	30-001-NB0
8	1	Body Seal	Fluorocarbon	V0-008-75H
9	1	Displacer Assembly	Polypropylene 316 SST	30-016-000 30-068-000
10	1	Hex Nut	316 SST	T6-08K-073
11	1	Float Rod	316 SST	30-005-0A0
12	1	Seal Retainer	316 SST	30-007-0A0
13	1	Pivot	17-4 PH SST.	30-079-000
14	1	Cone	17-4 PH SST	30-085-000
15	1	Transverse Rod Assy	316 SST & PTFE	88-043-000
16	1	Body Vent	316 SST	99-010-000
17	---	Repair Kit	Items: 2C,D,E,H,K,M,8,13	80-020-000

## SPECIFICATIONS

Maximum Test Pressure PSI (BAR) @ 100° F (37° C)	3240 (223)
Maximum Working Pressure PSI (BAR) @ 100° F (37° C)	2160 (149)
Ambient Temperature Range	-20/+180° F -29/+82° C
Maximum Process Fluid Temperature	180° F (93° C) 450° F (232° C)
Minimum Specific Gravity	0.6
Maximum Supply Pressure PSI (BAR)	35 (2.41)
Valve Cv Factor	0.042

## Ordering Number L80

STANDARD	N.A.C.E.	HIGH TEMP (+180° F)	316 & 17-4 PH ST. STEEL	FLUOROCARBON	BUNA-N (180° F)	KALREZ (450° F)	POLYPROPYLENE (210° F)	316 SST DISPLACER (450° F)	3-WAY PNEUMATIC VALVE	HIGH (REVERSE ACTING)	LOW (DIRECT ACTION)	NO OPTIONS	ADJUSTABLE SPRING	NO ADJUSTMENT	FLOAT ROD 2=1.87, 6=3.25, 8=6.40, 10 = 12.25"	HORIZONTAL
—	N	H	3	V	B	K	P	3	V	R	D	0	A	N	X	H



## INTRODUCTION

The K-Dyne, Inc. pneumatic version of the Model L80 is a 2" NPT mounted liquid level switch. It is typically mounted in a K-Dyne Model C80 cage shown in the Figure 1 for external bridle mounting or may be internally mounted in a 2" NPT (F) connection. Both mounting configurations are shown in Figure 2.

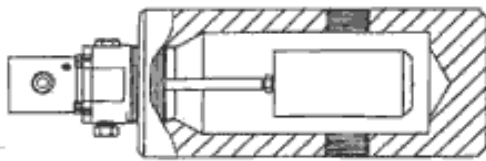


FIGURE 1  
MODEL L80 SHOWN IN MODEL C80 FLANGE

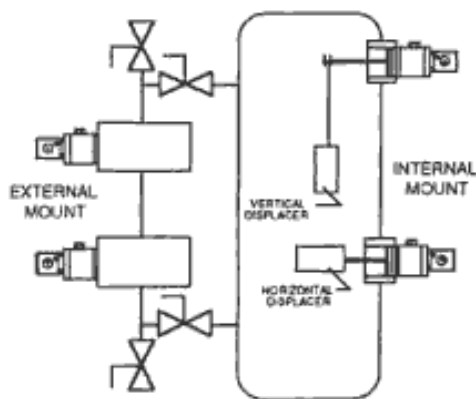


FIGURE 2  
TYPICAL MOUNTING OF MODEL L80  
LEVEL SWITCHES

These sensors send or remove a pneumatic signal when a liquid in a tank or a pressurized vessel reaches a predetermined level. The L80 operation mode as either a low (direct) or high (reverse) acting level switch is selected by rotating the pivot body 180°. The switch functions as a three way 'BLOCK and BLEED' valve. When used as a low acting switch the valve will bleed off a pneumatic signal when the liquid level is below the sensor trip point. For a high acting switch, the valve bleeds off a signal when the liquid level is above the sensor 'trip' point.

## 2.0 PRINCIPLE OF OPERATION (Refer to Figure 3)

The pneumatic version of the K-Dyne, Inc. Model L80 liquid level switch is a multi-functional pneumatic liquid level sensor. Depending on the mode of operation, it functions as a three way, normal closed (N.C.) or normally open (N.O.) pneumatic valve that will operate when the liquid level rises or falls below a fixed point in a tank or pressurize vessel. Valve supply pressures may be from 10 p.s.i. to 35 p.s.i. and 30 p.s.i. is

recommended for the most efficient operation.

The switch senses a change in the buoyancy of a displacer assembly (9) inside either a pressurized or an unpressurized vessel. A pivoting action is used to transmit the buoyancy change of the displacer assembly. The bore of the cone (14) contacts a pivot (13) on the pivot body (3). The o-ring (8) provides a pressure tight seal between the body (7) and the shaft of the cone protruding through the o-ring.

Pressure in the vessel acting on the shaft of the cone forces the cone against the pivot. The position of the pivot point, at the center of the o-ring, allows the displacer assembly to move vertically with the liquid level. This motion is guided to act along the axis of the transverse rod (15) by two vertical tabs on the pivot body that mate with notches in the cone. Any vertical motion of the displacer is transmitted by the cone to the ends of the transverse rod. A ramp on the outside diameter of the transverse rod contacts the tip of the valve stem (2G) to operate the valve.



## 2.1 LOW OPERATION

For use as a low-level sensor (output on rising level), the pivot body (3) is orientated with the enlarged end of the transverse rod (15) in the up position, towards the spring cap (4). The displacer assembly weight exerts a clockwise rotational force on the cone through the pivot. The spring (5), acting through the spring guide (6) exerts a counterclockwise rotational force on the cone. When the liquid level is below the displacer assembly, the clockwise force is greater. This greater force causes the cone to push upward against the transverse rod and the seat area of the valve stem (2G) remains positioned away from the ball (2C). In this position the ball is in contact with the seat (2L) and pressure at the 'SUPPLY' port is prevented from entering the 'OUTPUT' port. The 'OUTPUT' port and 'VENT' port are in communication allowing pressure at the 'OUTPUT' port to be vented.

As the liquid level rises and begins to cover the displacer assembly, its buoyancy, in the liquid, reduces the clockwise rotational force on the cone. When the spring exerts a greater counterclockwise rotational force the cone moves the transverse rod downward and the transverse rod ramp pushes the valve stem toward the ball. As the valve stem contacts the ball, the 'VENT' port is blocked and the ball disengages the seat. Pressure from the 'SUPPLY' port then passes through the valve body to the 'OUTPUT' port.

## 2.2 HIGH OPERATION

For use as a high level sensor (output on falling level), the pivot body is oriented with the enlarged end of the transverse rod (15) away from the spring cap (4). When the liquid level is above the displacer assembly, the counterclockwise rotational force of the spring on the cone is greater than the counterclockwise rotational force of the buoyant displacer. This larger force maintains the transverse rod in the down position causing the transverse rod ramp to keep the ball (2C) against the valve stem (2G) and away from the seat (2L). Communication between the 'VENT' port and 'OUTPUT' port is blocked and pressure from the 'SUPPLY' port is allowed to pass to the 'OUTPUT' port.

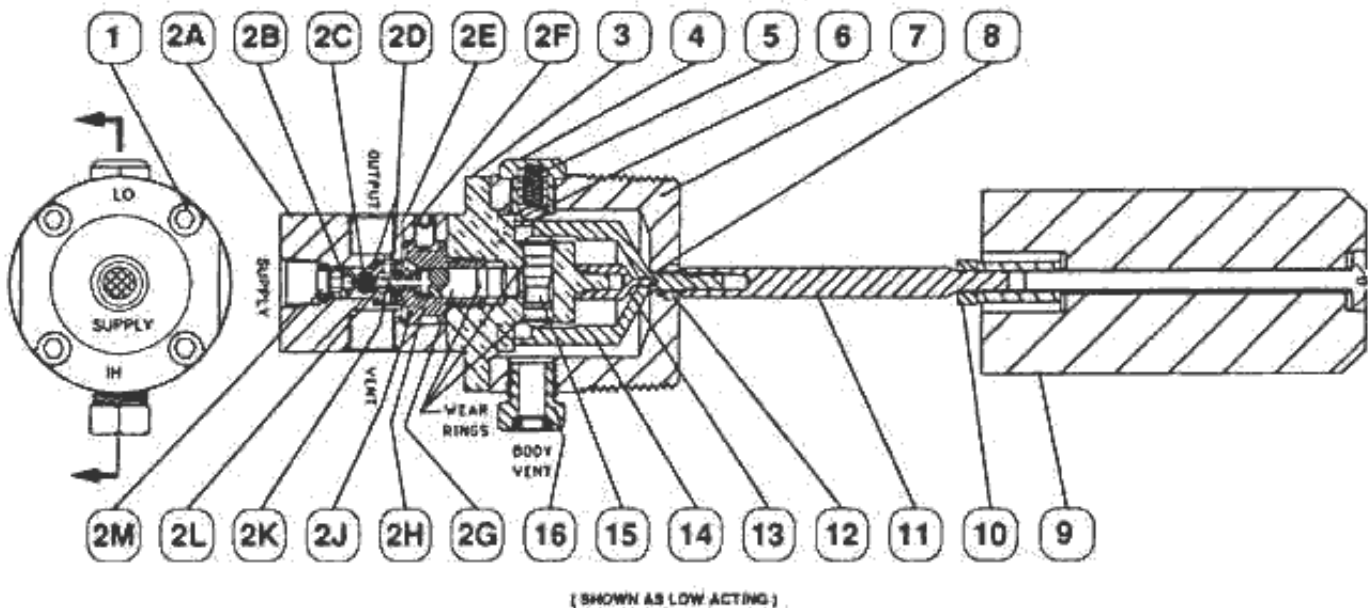




Figure 3

As the liquid level falls, the displacer loses its buoyancy and the clockwise rotational force on the cone becomes greater than the counterclockwise rotational force of the spring. The transverse rod is shifted upward allowing the valve stem to follow the transverse rod ramp, positioning the ball against the seat and blocking pressure communication between the 'SUPPLY' and 'OUTPUT' ports. As the ball contacts this seat the tip of the valve stem loses contact with the ball and allows pressure at the 'OUTPUT' port to pass through the valve 'VENT' port.

### 3.0 INSTALLATION

#### 3.1 EXTERNAL CAGE TO VESSEL

It is suggested that the Model L80 be installed in an external cage for maintenance and testing purposes. A recommended piping system for mounting an external cage to a vessel is shown in figure 2. The valves above and below the cage are required for testing and maintenance purposes.

If a cage with butt weld connections is used, the level switch should not be installed in the cage before welding. This will prevent weld sparks from damaging the displacer assembly. After welding install the level switch as per instructions in Section 3.2, LEVEL SWITCH INSTALLATION.

If the cage has threaded or flanged process connections, the level switch does not have to be removed before mounting the switch to the vessel. Cages with 1" NPT process connections may be installed on the vessel with 1",  $\frac{3}{4}$ ", or  $\frac{1}{2}$ " O.D. piping. CAUTION: The pressure rating of all pipe, valve, and pipe fittings must meet or exceed the working pressure of the vessel they are to be installed on. Adequate support for long pipe runs should be provided to prevent excessive vibrations of the level switch.

It is recommended that external cages be installed with the process connections as close to vertical and the cage length as close to horizontal as possible. This will insure the proper fluid flow through the cage.

#### 3.2 LEVEL SWITCH INSTALLATION

Before installing a level switch into an external cage, tank or vessel verify that the level switch is configured for the operation mode required (i.e. direct (low) or reverse (high) action). See Section 4.0 CHANGING MODE OF OPERATION and figure 5. NOTE: When direct mounting a level switch to a tank or vessel verify that the back of the displacer assembly will be at least  $\frac{1}{2}$ " (13mm) longer than the 2" connection it is being installed into. (See figure 4)

#### TOOL REQUIRED:

2.125" open end or suitable adjustable wrench or pipe wrench

3.2.1 Clean any dirt or debris from the 2" NPT pipe threads of the switch and mating connection

3.2.2 Apply Teflon tape or other thread sealing compound to the 2" NPT threads on the switch



3.2.3 Apply an anti-galling compound to the 2" NPT female thread that the switch is to be installed into.

3.2.4 Screw the switch into the mounting tread and tighten with the wrench. When tight, the spring cap must be up as shown in figure 5.

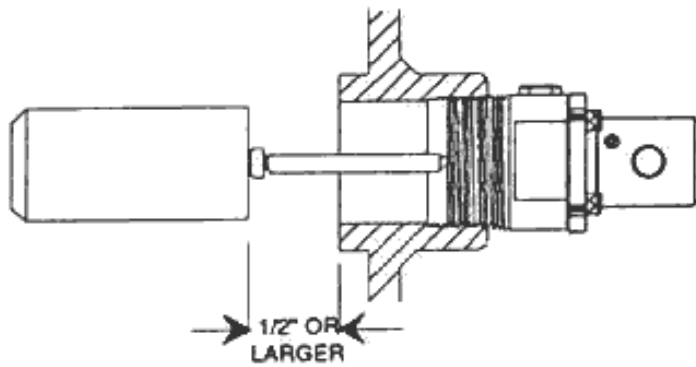


FIGURE 4  
TYPICAL DIRECT MOUNTING

**CAUTION:** If using a pipe wrench do not allow the wrench jaws to contact the spring cap. Wrench forces may damage the cap and prevent the switch from operating properly.

**NOTE:** THE SPRING CAP MUST ALWAYS BE IN THE VERTICAL POSITION AS SHOWN IN FIGURE 5 FOR THE SWITCH TO OPERATE PROPERLY.

3.2.5 Orientate the 'OUTPUT' port to facilitate connection of instrument lines by loosening the three set screws (2F) on the valve body (2A) and rotating the valve body to the desired position.

**CAUTION:** DO NOT position the valve body 'VENT' port in the up position. This allows debris and liquids to accumulate in the valve assembly and prevent proper operation. Align the 'VENT' port in either the horizontal or down position.

3.2.6 Lightly tighten each of the three set screws first and then firmly tighten them in a clockwise pattern.

#### 4.0 CHANGING MODE OF OPERATION (Refer to figure 5)

TOOL REQUIRED: 3/16" Allen wrench

The level switch mode of operation may be easily changed. If the level switch is installed in a pressurized cage or vessel, the pressure does not have to be removed. Figure 5 shows the proper orientation of the level switch function stamping for low and high acting operation.

#### 4.1 UPRESSURIZED CAGE OR VESSEL

4.1.1 Verify that no pressure is present in the cage or vessel. If this cannot be verified, follow instructions in Section 4.2 PRESSURIZED CAGE OR VESSEL.

4.1.2 Block and bleed the instrument pressure from the 'SUPPLY' port. Remove any instrument tubing connected to the 'SUPPLY' and 'OUTPUT' ports.



6.17 Lubricate the shaft and the treads on the treaded end of the cone. Install the cone into the body by turning the cone clockwise and pushing gently.

6.18 Align the tabs on the pivot body with the slots in the cone (14) and slide the pivot body into the level switch body.

6.19 Align the valve body in the correct position for the desired direct or reverse operation, see figure 5. Install and tighten the four hex socket and head cap screws (1).

6.20 Thread the rod (11) onto the cone and tighten securely with pliers. If the displacer assembly was removed, reinstall and tighten the lock nut (10) securely.

6.21 Insert the spring (5) and spring guide (6) into the spring cap (4). Install the spring cap into the body and tighten.

6.22 Replace the level switch assembly into the cage or mating flange as per instructions in Section 3.0 INSTALLATION.

## 7.0 SWITCH CALIBRATION

7.1 Due to manufacturing tolerances or part wear, it may be necessary to adjust the valve stem (2G) length when a new or repaired valve assembly (2) is installed.

7.2 Install the repaired or new valve assembly per procedures in paragraph 6.14 of this manual.

7.3 Connect a suitable instrument supply to the valve assembly 'SUPPLY' port and an indication device such as a pressure gauge to the 'OUTLET' port.

7.4 If the switch is not installed in a vessel it may be tested by raising and lowering the displacer assembly manually. For a switch installed in a vessel or external cage it is recommended to use the actual process fluid to check for proper switch operation.

7.5 Switches that are installed but not practical to operate with the process fluids may be tested by removing the spring cap (4) and the spring (5) then depressing and releasing the spring guide (6).

7.6 Should the switch operation have one of the malfunctions as given in the table of 7.7, use procedures given in paragraphs 7.8 thru 7.11 to calibrate the switch.





4.1.3 With the 3/16" Allen wrench remove the four hex socket head cap screws. (1). CAUTION: If the pivot body moves outward as these screws are being removed, the vessel or cage is not completely depressurized. Re-install the screws and perform procedures in Section 4.2 of this manual. Rotate the pivot body 180° to change the mod of operation from low to high or form high to low as desired. See figure 5 for proper pivot body orientation.

4.1.4 Replace the four hex socket head cap screws and tighten.

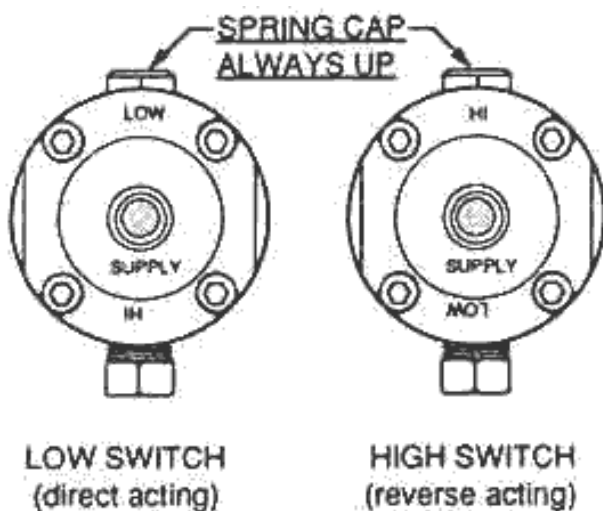
4.1.5 Re-align the valve ports as desired using the procedures given in paragraph 3.2.5.

#### 4.2 PRESSURIZED CAGE OR VESSEL

4.2.1 Block and bleed the instrument pressure form the 'SUPPLY' port. Remove any instrument tubing connected to the 'SUPPLY' and 'OUTPUT' ports

4.2.2 Use a 3/16" Allen wrench and remove two of the hex socket head cap screws (1) that are diagonally apart. Replace the two hex socket head cap screws just removed with two 1/4" -20 screws or bolts that are 1-1/4" to 1-1/2" long. These serve as a safety stop in the event the level switch has received unknown damage. Rotate the remaining two screws on turn at a time, alternating between the two. The process pressure, acting on the end of the cone (14) that is protruding through the body, will move the pivot body outward as the two screws are turned. When the pivot body has stopped moving, remove the four screws completely. Rotate the pivot body 180° to change the mode of operation if necessary. See figure 5 for proper pivot body orientation.

CAUTION: THE PIVOT BODY SHOULD MOVE OUTWARD APPROXIMATELY 1/16" AND STOP AS THE ROD (11) CONTACTS THE BODY. IF THE PROCESS PRESSURE IS STILL EXERTING A FORCE ON THE PIVOT AFTER IT MOVES 1/8" STOP TURNING THE TWO SCREWS. THE UNIT MAY HAVE DAMAGE THAT WILL ALLOW THE CONE TO DISENGAGE THE O-RING (8) AND THE PROCESS PRESSURE AND MEDIUM WILL ESCAPE THROUGH THE BODY. THE PROCESS PRESSURE WILL HAVE TO BE REMOVED FROM THE CAGE OR VESSEL BEFORE ANY FURTHER DISASSEMBLY IS POSSIBLE.



4.2.3

Replace the four hex socket head cap screws and tighten.

4.2.4 Reconnect the instrument lines.

#### 5.0 DISSASSEMBLY (Refer to figures 1 & 3)

TOOLS REQUIRED:

- 7/16" open end wrench or adjustable wrench



- 5/16" open end wrench or adjustable wrench
- 3/16" and 1/8" Allen wrenches
- needle nose pliers
- pliers
- o-ring pick or small screwdriver

CAUTION: ONLY THE VALVE ASSEMBLY AND PIVOT BODY CAN BE REMOVED FROM THE LEVEL SWITCH UNIT WITHOUT DEPRESSURIZING THE CAGE OR VESSEL. ANY FURTHER DISASSEMBLY WITH PRESSURE PRESENT ON THE CAGE OR VESSEL WILL RESULT IN SEVERE PERSONAL INJURY OR DAMAGE TO EQUIPMENT.

## 5.1 VALVE DISASSEMBLY

5.1.1 Bleed off all instrument pressure from the valve assembly and remove all tubing and fittings from the valve body (2A).

5.1.2 Remove the valve assembly from the pivot body (3) by rotating it counterclockwise. NOTE: The valve stem (2G) and stem spring (2H) are free to move and care should be taken not to accidentally let them separate from the valve assembly. To avoid damaging or marring the valve assembly it is recommended to install a pipe fitting into the 'VENT' port of the valve assembly and tap it to remove the valve.

5.1.3 Pull the valve stem and stem spring out of the adapter head (2J).

5.1.4 To remove the filter disc (2M) from the valve body, insert the tip of an O-ring pick or small screwdriver between the outside diameter of the filter disc and the inside diameter of the 'SUPPLY' port. Pry inward and upward with the pick or screwdriver to rotate the disc edgewise in the port. Use needle nose pliers to pull the disc from the hole.

5.1.5 Loosen the three set screws (2F) sufficiently enough to allow the adapter head to be pulled from the valve body (2A). It is not necessary to completely remove these screws.

5.1.6 Insert an Allen wrench or other rod shaped tool thru the 'SUPPLY' port and push the ball (2C) and valve seat (2L) out of the valve body.

5.1.7 Use a pick or small screwdriver to remove the o-ring. This is permanently installed in the valve body. O-rings (2D) & (2E) from the body and O-rings (2D) & (2K) from the seat. Discard all used seals.

5.1.8 DO NOT remove the ball retainer (2B) from the valve body.



5.1.9 The valve stem wear ring should not be removed unless damaged or an excessive amount of debris has accumulated on the O.D. of the valve stem. These rings are split and may be removed like an O-ring. The wear rings are plastic and breakable, exercise care when removing them.

5.1.10 The plastic cap on the valve stem should also not be removed and attempting to do so would change the factory set adjustment. Switch re-calibration would be necessary.

## 5.2 PIVOT BODY DISSASSEMBLY

5.2.1 For pivot body removal from a non-pressurized cage or vessel use a 3/16" Allen wrench and remove the four hex socket head cap screws (1).

5.2.2 For pivot body removal from a pressurized cage or vessel use a 3/16" Allen wrench and remove the two of the hex socket head cap screws that are diagonally apart. Replace the two hex socket head cap screws just removed with two 1/4" -20 screws or bolts that are 1-1/4" to 1-1/2" long. These serve as a safety stop in the event the level switch has received unknown damage. Rotate the remaining two screws one turn at a time, alternating between the two. The process pressure, acting on the end of the cone (14) that is protruding through the body, will move the pivot body outward as the two screws are turned. When the pivot body has stopped moving, remove the four screws completely.

**CAUTION: THE PIVOT BODY SHOULD MOVE OUTWARD APPROXIMATELY 1/16" AND STOP AS THE ROD (11) CONTACTS THE BODY. IF THE PROCESS PRESSURE IS STILL EXERTING A FORCE ON THE PIVOT AFTER IT MOVES 1/8" STOP TURNING THE TWO SCREWS. THE UNIT MAY HAVE DAMAGE THAT WILL ALLOW THE CONE TO DISENGAGE THE O-RING (8) AND THE PROCESS PRESSURE AND MEDIUM WILL ESCAPE THROUGH THE BODY. THE PROCESS PRESSURE WILL HAVE TO BE REMOVED FROM THE CAGE OR VESSEL BEFORE ANY FURTHER DISSASSEMBLY IS POSSIBLE.**

5.2.3 Pull the pivot body (3) from the body (7). NOTE: The transverse rod (15) fits loosely in the pivot body and care should be taken not to accidentally let it fall out of the pivot body.

5.2.4 Remove the transverse rod from the pivot body

5.2.5 Use pliers to hold the O.D. of the pivot point (13) and rotate it counter clockwise to remove it from the pivot body.

## 5.3 FULL DISSASSEMBLY

5.3.1 For full disassembly, it is necessary to completely remove the pressure from the cage or vessel the switch is installed in. All liquids should be drained to a position below the level switch.

**CAUTION: ALL PRESSURE MUST BE REMOVED FROM THE CAGE OR VESSEL BEFORE FULL DISSASSEMBLY CAN BE PERFORMED. FAILURE TO REMOVE THE PRESSURE MAY RESULT IN PERSONAL INJURY OR DAMAGE TO EQUIPMENT.**



- 5.3.2 Loosen and remove the level switch from the tank, vessel or cage that it is mounted to.
- 5.3.3 Hold the rod (11) with the pliers and rotate it counter-clockwise to remove it from the level switch.
- 5.3.4 Normally it is not necessary to remove the displacer assembly from the rod. If required, loosen the lock nut (10) and unthread the displacer assembly from the rod.
- 5.3.5 Follow instructions in Section 5.1 VALVE DISASSEMBLY to remove and disassemble the valve body.
- 5.3.6 Use the 5/8" wrench and rotate the spring cap (6) counter clockwise to remove it from the body (5). Care should be taken no to lose the spring (7) and spring guide (8).
- 5.3.7 Push the threaded end of the cone (14) through the body.
- 5.3.8 Using an o-ring pick or small screwdriver remove the O-ring (8) form the body.

## 6.0 REPAIR AN ASSEMBLY REFER TO THE SWITCH DATA SHEET FOR REPLACEMENT PART NUMBERS

### TOOLS REQUIRED:

- 7/16" open end wrench or adjustable wrench
- 5/18" open end wrench or adjustable wrench
- 3/16" and 1/8" Allen wrenches
- needle nose pliers
- pliers
- safety solvent
- silicone based o-ring lubricant

- 6.1 Using an appropriate safety solvent, clean all parts.
- 6.2 Inspect the I.D. of the transverse rod bore in the pivot body (3) and the O.D. of the transverse rod (15) for corrosion and excessive wear. The surface of the bore and the ramp on the transverse rod should have a mirror like appearance. Replace any worn or damaged parts.
- 6.3 Examine the valve stem (2G) for corrosion and excessive wear. The small sealing diameter should have a mirror like surface and the seat at the tip should be free of indentations. Insure that the cap that contacts the transverse rod ramp is still pointed. Replace any worn or damaged parts.
- 6.4 The seat (2L) at the contact point of the ball (2C) should be free of any indentations. The ball should also have a polished finish and have no corrosion or gouges.



- 6.5 If the level switch has a stainless steel displacer assembly, it should be free of dents, cracks or holes.
- 6.6 Lubricate all seals from the repair kit with a silicone based lubricant.
- 6.7 Lightly lubricate the filter disc (2M) O-ring and push the disc edgewise into the center of the 'SUPPLY' port until it stops. Start rotation the disc across the port so the filter screen will be toward the ball retainer (2B) while pushing downward on the outside edge that is closest to the end of the valve body.
- 6.8 Use a blunt rod, such as an Allen wrench, and push the edge of the disc as far down a possible. Using the end of an O-ring pick or small screwdriver inserted between the disc O.D. and 'SUPPLY' port I.D., press firmly on the O-ring around the circumference of the filter disc to completely seat it in the port.
- 6.9 Install the O-rings (2D) and (2E) into the valve body and the O-rings (2D) and (2K) on the seat. O-ring (2K) is a blue color.
- 6.10 Place the ball into the valve body and install the seat. Place the adapter head (2J) into the valve body and tighten he set screws (2F).
- 6.11 Lubricate the valve stem and transverse rod. DO NOT excessively lubricate, this will prevent proper operation of the level switch. Be sure to re-install the wear rings if removed.
- 6.12 Install the valve stem and stem spring (2H) into the adapter head (2J). Depress the valve stem down into the body and release. It should move completely and freely outward. NOTE: Care should be taken not to lose these pieces while handling.
- 6.13 Insert the small diameter of the transverse rod (15) into the counter bored side of the hole of the pivot body (3), and push it full into the pivot body. Slide it in and out approximately 1/8" to verify that it is not binding.
- 6.14 Thread the valve into the pivot body. To tighten the valve assembly and to avoid damaging or marring the valve assembly it is recommended to install a pipe fitting into the 'VENT' port of the valve assembly and tap it lightly.
- 6.15 Install the body O-ring (8) into the body (7).
- 6.16 Thread the replacement pivot (13) onto the pivot body and tighten. Lubricate the pivot point and the square tabs on the pivot body.



7.7

Switch Response	Calibration
Output signal does not bleed off	Shorten Valve Stern
Slow bleed off of output signal	
No output signal	Lengthen Valve Stern
Slow increases of output signal	

7.8 Remove the valve assembly, valve stem and stem spring per procedures in paragraphs 5.1.2 and 5.1.3.

7.9 Insert a small dowel, pick or Allen Wrench into the hole on the plastic cap of the valve stem and one in the cross drilled hole of the stem. With the plastic cap facing up, rotate the cap approximately 30° counterclockwise to lengthen and clockwise to shorten the stem.

7.10 Re-install the valve assembly onto the switch and then retest the switch.

7.11 Repeat these procedures as required until the switch is functioning properly.

8.0 RECOMMENDED MAINTENANCE

PROCEDURE	INTERVAL
Test switch in place with liquid to check for proper operation.	every 30 days
Clean vent ports of debris	every 30 days
Replace body seal (8)	as required

TROUBLE SHOOTING:

PROBLEM	POSSIBLE CAUSES	RECOMMENDED ACTION
Level Switch does not function	Debris blocking the valve vent port	Clean vent port and test switch.
	Debris on the inside of the cone	Remove pivot body (3) per procedures in Section 4.0 and clean cone I.D.
	Valve not functioning	Follow procedures in section 5.2 and 6.0 to disassemble and clean valve. Replace seals if necessary.
	Supply port plugged	Disconnect all instrument tubing and clean supply port. Clean instrumentation system filters.
	Connection tubing plugged	Remove and clean or replace instrument tubing. Clean instrumentation system filters.
	Debris accumulation on displacer assembly (9) or in external cage.	Remove switch from vessel or cage per procedures in Section 6.0 and clean.
	Level switch not installed	Use instructions given in Section





	properly. Spring cap not in the 'UP' position	3.0 & 4.0 to properly install the switch.
	Specific gravity of fluid too light for switch to function	Consult factory for optional Models available
	Stainless steel displacer assembly (if used) damaged	Remove switch from vessel or cage per procedures in 5.3 and replace displacer assembly.
Constant gas leakage from vent port in valve	Valve seals (2K) & (2D) damaged or worn	Follow procedures in Sections 5.1 & 6.0 to disassemble and replace the seals.
	Debris on valve seat (2L) or valve stem (2G)	Follow procedures in Sections 5.1 & 6.0 to disassemble and clean valve.
Liquid or gas leakage from body vent	Body o-ring (8) damaged or worn	Replace body seal (8) per instructions in Sections 5.0 & 6.0.



**L80 ELECTRIC**



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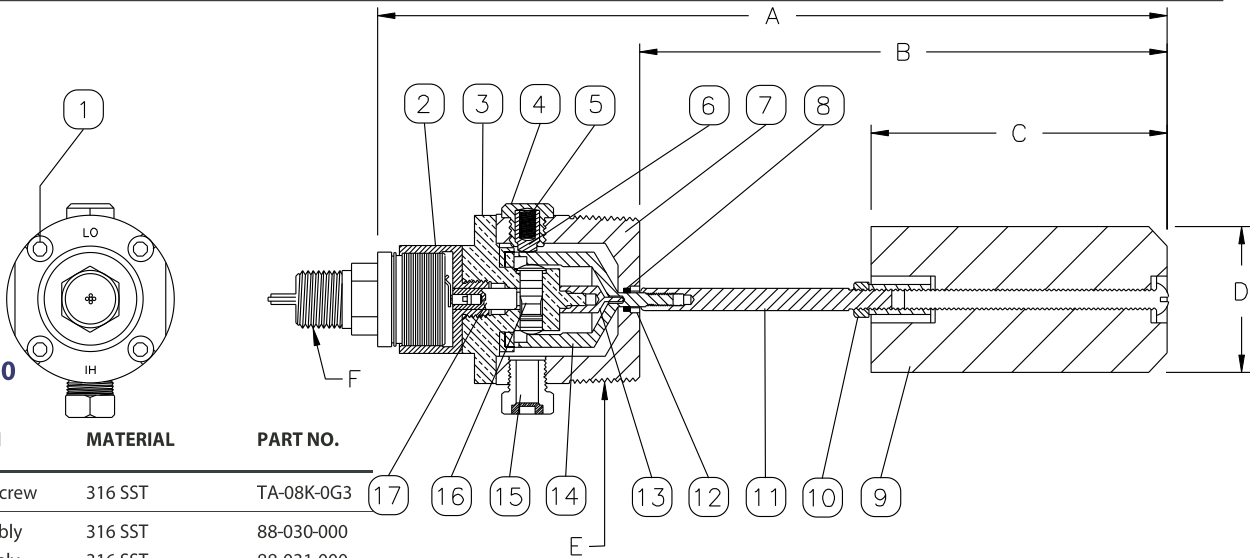


# MODEL L80 ELECTRIC

The Model L80 switch incorporates a 2" NPT thread mounting and an explosion proof SPDT or DPDT snap acting dry contact switch. The design has a non-adjustable trip point and narrow level operation range making it perfect for applications where trip point tampering is unacceptable. Factory installed explosion proof junction boxes with terminals are available.

## Parts List for Level Switch L80

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	PART NO.
1	4	Socket Cap Screw	316 SST	TA-08K-0G3
2	1	DPDT Assembly SPDT Assembly	316 SST 316 SST	88-030-000 88-031-000
3	1	Pivot Body	316 SST	80-017-000
4	1	Spring Cap	316 SST	30-012-000
5	1	Spring	Inconel X-750	30-014-000
6	1	Spring Guide	Acetal 316 SST	30-008-000
7	1	2" NPT Body	316 SST	30-001-NB0
8	1	Body Seal	Fluorocarbon	VO-008-75H
9	1	Displacer Assembly	Polypropylene 316 SST	30-016-000 30-068-000
10	1	Hex Nut	316 SST	TB-08K-073
11	1	Float Rod	316 SST	30-005-0A0
12	1	Seal Retainer	316 SST	30-007-0A0
13	1	Pivot	17-4 PH SST	30-079-000
14	1	Cone	17-4 PH SST	30-085-000
15	1	Body Vent	316 SST	99-010-000
16	1	Transverse Rod Assy	316 SST & PTFE	88-043-000
17	1	Push Rod Assembly	Acetal & 18-8 SST	88-020-000



	LOCATION	ELECTRICAL
<b>SWITCH</b>	U.L. <sup>TM</sup> rated dry contact snap switch for hazardous locations Class I groups A, B, C & D Class II groups E, F & G: Hermetically Sealed, NEMA 7 & 9	U.L. <sup>TM</sup> rated 11 Amps 1/4 HP @ 125/250 VAC.; 5 Amps Res./3 Amps Ind. @ 28 VDC.; 5 Amps Res./25 Amps Ind @ 125 VDC 18 AWG x 18" leads

## SPECIFICATIONS

Maximum Test Pressure PSI (BAR) @ 100° F (37° C)	3240 (223)
Maximum Working Pressure PSI (BAR) @ 100° F (37° C)	2160 (149)
Ambient Temperature Range	-20/+165° F -29/+74° C
Maximum Process Fluid Temperature	180° F (93° C) 450° F (232° C)
Minimum Specific Gravity	0.6

## DIMENSIONS in. (mm)

A	11.60 (294)
B	7.35 (186)
C	4.10 (104)
D	2.00 (51)
E	2.37 (60)
F	1.50 (38)
Weight	3.6 Lbs (1.64 kg)

## Ordering Number L80

Ordering Number	Option
1	STANDARD
N	N.A.C.E.
H	HIGH TEMP (+180° F)
3	316 & 17-4 PH ST. STEEL
V	FLUOROCARBON
B	BUNA-N (180° F)
K	KALREZ (450° F)
P	POLYPROPYLENE (210° F)
3	316 SST DISPLACER (450° F)
S	SPDT SWITCH
D	DPDT SWITCH
R	HIGH (REVERSE ACTING)
D	LOW (DIRECT ACTION)
0	NO OPTIONS
C	EXPLOSION PROOF JUNCTION BOX
A	ADJUSTABLE SPRING
N	NO ADJUSTMENT
X	FLOAT ROD 2=1.87, 6=3.25, 8=6.40, 10=12.25"
H	HORIZONTAL



The K-Dyne, Inc. electric version of the Model L80 is a 2" NPT mounted liquid level switch. It is typically mounted in a K-Dyne Model C80 cage shown in the figure 1 for external bridle mounting or may be internally mounted in a 2" NPT (F) connection. Both mounting configurations are shown in figure 2.

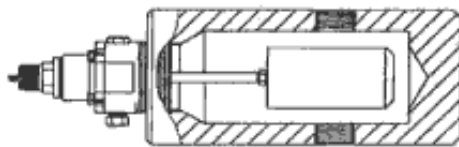


FIGURE 1  
MODEL L80 SHOWN IN MODEL C80 FLANGE

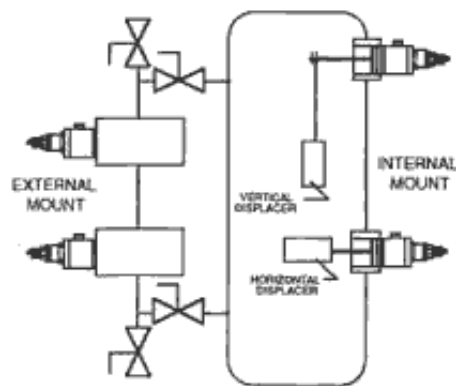


FIGURE 2  
TYPICAL MOUNTING OF MODEL L80  
LEVEL SWITCHES

These sensors send or remove an electric signal when a liquid in a tank or a pressurized vessel reaches a predetermined level. The L80 operation mode as either a low (direct) or high (reverse) acting level switch is selected by rotating the pivot body 180°. Selection of N.O. or N.C. switching depends upon the wiring configuration utilized. Both SPDT or DPDT snap acting dry contacts offered with the switch are U.L.T rated for hazardous locations.

## 2.0 PRINCIPLE OF OPERATION (Refer to Figure 3)

The electric version of the K-Dyne, Inc. Model L80 2" NPT mounted liquid level switch is a multi-functional pneumatic liquid level sensor. Depending on the mode of operation, it functions as a three way, normal closed (N.C.) or normally open (N.O.) electric switch that will operate when the liquid level rises or falls below a fixed point in a tank or pressurize vessel. Type of voltage may be A.C. or D. C. and the maximum amperage depends on the amount of voltage used. Consult the data sheet of the specific switch being used for the switch rating.

The switch senses a change in the buoyancy of a displacer assembly (9) inside either a pressurized or an unpressurized vessel. A pivoting action is used to transmit the buoyancy change of the displacer assembly. The bore of the cone (14) contacts a pivot (13) on the pivot body (3). The o-ring (8) provides a pressure tight seal between the body (7) and the shaft of the cone protruding through the o-ring.

Pressure in the vessel acting on the shaft of the cone forces the cone against the pivot. The position of the pivot point, at the center of the o-ring, allows the displacer assembly to move vertically with the liquid level. This motion is guided to act along the axis of the transverse rod (16) by two vertical tabs on the pivot body that mate with notches in the cone. Any vertical motion of the displacer is transmitted by the cone to the ends of the transverse rod. A ramp on the outside diameter of the transverse rod contacts the tip of the push rod (17) to operate the lever on the switch assembly (2).

## 2.1 LOW OPERATION

For use as a low-level sensor (output on rising level), the pivot body (13) is positioned with the enlarge end of the transverse rod (16) up towards the spring cap (4). The displacer assembly weight exerts a clockwise rotational force on the cone through the pivot. The spring (5), acting through the spring guide (6) exerts a counterclockwise rotational force on the cone. When the liquid level is below the displacer assembly, the clockwise force is greater. This force causes the cone to push upward against the transverse rod allowing the tip of the push rod to be positioned away from the switch assembly lever. In



this position N.O. or N.C. contacts are in the normal position (i.e. N.O. contacts are open and N.C. contacts are closed).

As the liquid level rises and begins to cover the displacer assembly, its buoyancy, in the liquid, reduces the clockwise rotational force on the cone. When the spring exerts a greater counterclockwise rotational force the cone moves the transverse rod downward and the transverse rod ramp moves the push rod to operate the switch assembly lever. When the switch operates, the state of the contacts reverse (i.e. N.O. contacts are closed and N.C. contacts are open).

### 2.2 HIGH OPERATION

For use as a high level sensor (output on falling level), the pivot body is oriented with the enlarged end of the transverse rod down away from the spring cap. When the liquid level is above the displacer assembly, the counterclockwise rotational force of the spring on the cone is greater than the counterclockwise rotational force of the buoyant displacer. This larger force maintains the transverse rod in the down position while the transverse rod ramp pushing on the push rod keeps the switch assembly lever in the operated position. The switch contacts remain in the reversed position.

As the liquid level falls, the displacer assembly loses its buoyancy and the clockwise rotational force on the cone becomes greater than the counterclockwise rotational force of the spring. The transverse rod is shifted upward allowing the push rod to move away from the switch assembly lever. When the switch operates the contacts return to their normal state.

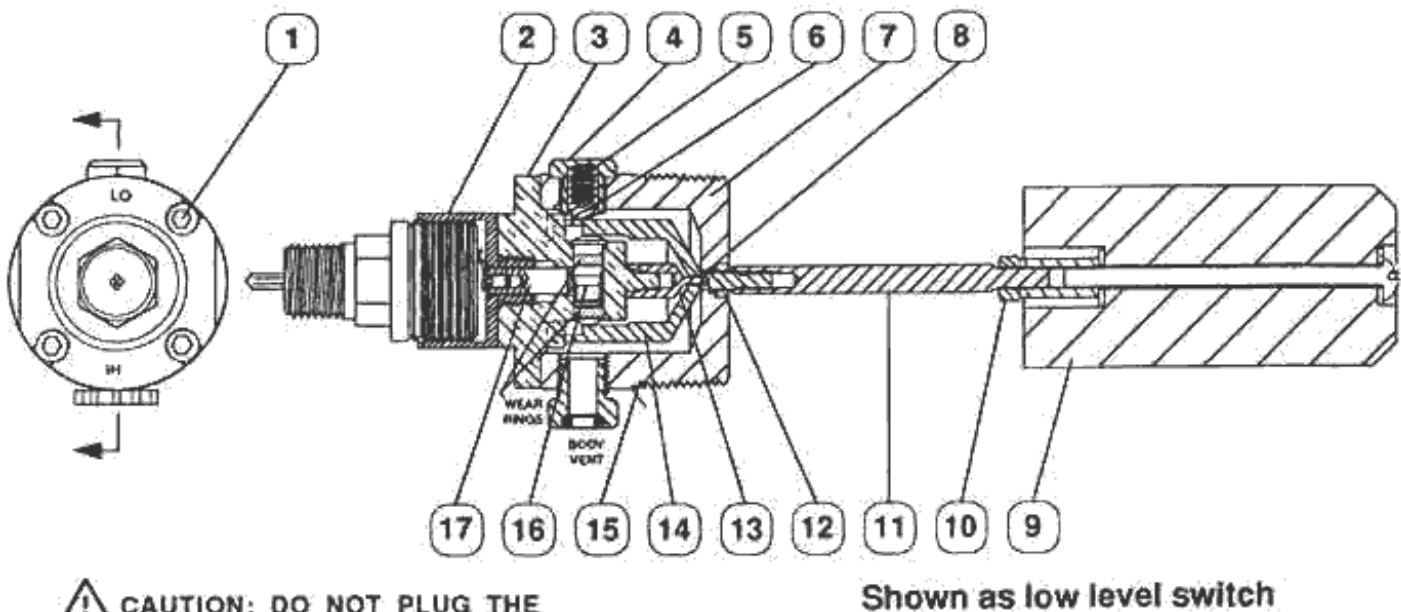


FIGURE 3

## 3.0 INSTALLATION

### 3.1 EXTERNAL CAGE TO VESSEL



It is suggested that the Model L80 be installed in an external cage for maintenance and testing purposes. A recommended piping system for mounting an external cage to a vessel is shown in Figure 2. The valves above and below the cage are required for testing and maintenance purposes.

If a cage with weld connections is used, the level switch should be removed from the cage before welding. This will prevent weld sparks from damaging the displacer assembly. Remove the switch from the cage as per instructions in paragraphs 5.2.1 through 5.2.2 of the FULL DISASSEMBLY section of this manual. After welding install the level switch as per instructions in Section 3.2 INSTALLING SWITCH IN CAGE.

If the cage has threaded or flanged process connections, the level switch does not have to be removed before mounting the switch to the vessel. Cages with 1" NPT process connections may be installed on the vessel with 1",  $\frac{3}{4}$ ", or  $\frac{1}{2}$ " O.D. piping. CAUTION: The pressure rating of all pipe, valve, and pipe fittings must meet or exceed the working pressure of the vessel they are to be installed on. Adequate support for long pipe runs should be provided to prevent excessive vibrations of the level switch.

It is recommended that external cages be installed with the process connections as close to vertical and the cage length as close to horizontal as possible. This will insure the proper fluid flow through the cage.

### 3.2 LEVEL SWITCH INSTALLATION

Before installing a level switch into an external cage or mating flange verify that the level switch is configured for the operation mode required (i.e. direct (low) or reverse (high) action). See Section 4.0 CHANGING MODE OF OPERATION and Figure 5. NOTE: When direct mounting a level switch to a tank or vessel verify that the back of the displacer assembly will be at least  $\frac{1}{2}$ " (13mm) longer than the 2" connection it is being installed into (See Figure 4).

#### TOOL REQUIRED:

- 2.125" open end or suitable adjustable wrench or pipe wrench

3.2.1 Clean any dirt or debris from the 2" NPT pipe threads of the switch and mating connection

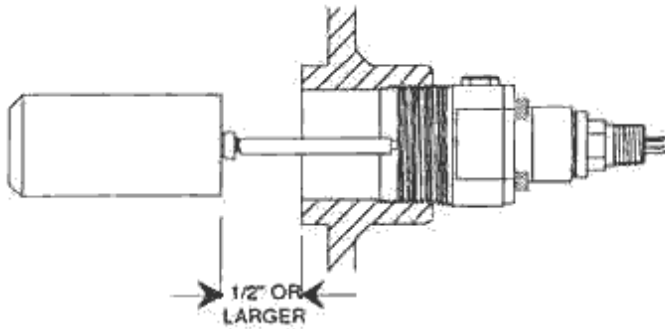
3.2.2 Apply Teflon tape or other thread sealing compound to the 2" NPT threads on the switch

3.2.3 Apply anti-galling compound to the 2" NPT female thread that the switch is to be installed into.

3.2.4 Screw the switch into the mounting thread and tighten with the wrench. When tight, the spring cap must be up as shown in figure 5.







**FIGURE 4  
TYPICAL DIRECT MOUNTING**

**CAUTION:** If using a pipe wrench do not allow the wrench jaws to contact the spring cap. Wrench forces may damage the cap and prevent the switch from operating properly.

**NOTE:** THE SPRING CAP MUST ALWAYS BE IN THE VERTICAL POSITION AS SHOWN IN

FIGURE 5 FOR THE SWITCH TO OPERATE PROPERLY.

#### 4.0 ELECTRICAL CONNECTIONS

**CAUTION:** REMOVE AND LOCK OUT ALL ELECTRICAL POWER BEFORE WORKING ON ELECTRICAL SWITCH LEADS.

4.1.1 **CAUTION:** Be sure to follow all applicable electrical codes and regulations when installing electrical connections or conduit to the switch.

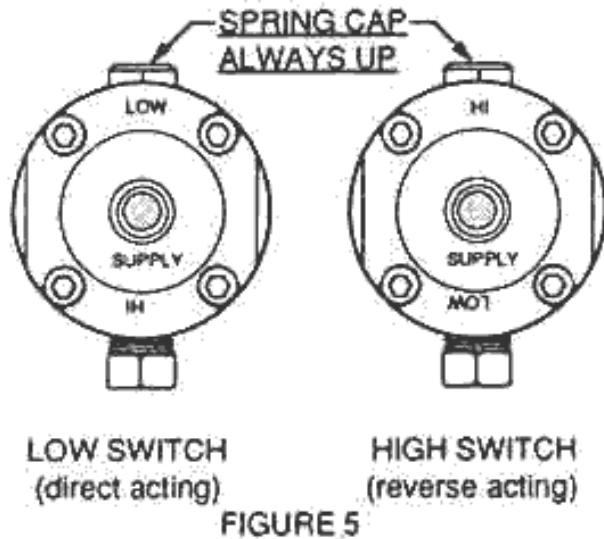
4.1.2 When connecting or removing conduit connections to the switch assembly 1/2" NPT thread, use a 7/8" open-end wrench or an adjustable wrench on the hex portion of the switch assembly to provide a proper back-up. This will prevent damage to the connection thread between the electric switch assembly and the level switch body.

4.1.3 The electric switch leads are labeled and color coded for the type of switch contact. Connection of these leads for the desired switch operating function is shown on Table #1.

<b>SPDT SWITCH</b>		
<b>LOW OPERATION</b>		
<b>COLOR</b>	<b>LEVEL</b>	<b>CONTACT FUNCTION</b>
BLUE	N.O.	CLOSES ON RISING LEVEL
BROWN	C	COMMON CONTACT
RED	N.C.	OPENS ON RISING LEVEL
<b>HIGH OPERATION</b>		
<b>COLOR</b>	<b>LEVEL</b>	<b>CONTACT FUNCTION</b>
BLUE	N.O.	CLOSES ON FALLING LEVEL
BROWN	C	COMMON CONTACT
RED	N.C.	OPENS ON FALLING LEVEL
<b>DPDT SWITCH</b>		
<b>LOW OPERATION</b>		
<b>COLOR</b>	<b>LEVEL</b>	<b>CONTACT FUNCTION</b>
BLUE	N.O.	CLOSES ON RISING LEVEL
BROWN	C	SW. 1 COMMON CONTACT
RED	N.C.	OPENS ON RISING LEVEL
PURPLE	N.O.2	CLOSES ON RISING LEVEL
YELLOW	C.2	SW. 2 COMMON CONTACT
BLACK	N.C.2	OPENS ON RISING LEVEL
<b>HIGH OPERATION</b>		
<b>COLOR</b>	<b>LEVEL</b>	<b>CONTACT FUNCTION</b>



BLUE	N.O.	CLOSES ON FALLING LEVEL
BROWN	C	SW. 1 COMMON CONTACT
RED	N.C.	OPENS ON FALLING LEVEL
PURPLE	N.O.2	CLOSES ON FALLING LEVEL
YELLOW	C.2	SW. 2 COMMON CONTACT
BLACK	N.C.2	OPENS ON FALLING LEVEL



#### 5.0 CHANGING MODE OF OPERATION (Refer to Figure 3)

- TOOL REQUIRED: 3/16" Allen wrench

The level switch mode of operation may be easily changed. If the level switch is installed in a pressurized cage or vessel, the pressure does not have to be removed. Figure 5 shows the proper orientation of the level switch function stamping for low and high acting operation.

#### 5.1 UPRESSURIZED CAGE OR VESSEL

5.1.1 Verify that no pressure is present in the cage or vessel. If this cannot be verified, follow instructions in Section 4.2 PRESSURIZED CAGE OR VESSEL.

5.1.2 **CAUTION: REMOVE AND LOCK ALL ELECTRICAL POWER BEFORE WORKING ON ELECTRICAL SWITCH LEADS.** Disconnect all electrical switch lead connections. **DO NOT** attempt to remove the electric switch assembly until the leads are disconnected. Follow all applicable codes when working with electrical equipment, especially in areas that are classified as hazardous.

5.1.3 With the 3/16" Allen wrench remove the four hex socket head cap screws. (1). Rotate the pivot body 180° to change the mod of operation from low to high or form high to low as desired. See Figure 5 for proper pivot body orientation.

5.1.4 Replace the four hex socket head cap screws and tighten.

5.1.5 Reconnect all electrical switch leads.

#### 5.2 PRESSURIZED CAGE OR VESSEL



5.2.1 CAUTION: REMOVE AND LOCK ALL ELECTRICAL POWER BEFORE WORKING ON ELECTRICAL SWITCH LEADS. Disconnect all electrical switch lead connections. DO NOT attempt to remove the electric switch assembly until the leads are disconnected. Follow all applicable codes when working with electrical equipment, especially in areas that are classified as hazardous.

5.2.2 Use a 3/16" Allen wrench and remove two of the hex socket head cap screws (9) that are diagonally apart. Replace the two hex socket head cap screws just removed with two 1/4" -20 screws or bolts that are 1-1/4" to 1-1/2" long. These serve as a safety stop in the event the level switch has received unknown damage. Rotate the remaining two screws one turn at a time, alternating between the two. The process pressure, acting on the end of the cone (14) that is protruding through the body, will move the pivot body outward as the two screws are turned. When the pivot body has stopped moving, remove the four screws completely. Rotate the pivot body 180° to change the mode of operation (if necessary). See Figure 5 for proper pivot body orientation modes.

CAUTION: THE PIVOT BODY SHOULD MOVE OUTWARD APPROXIMATELY 1/16" AND STOP AS THE DISPLACER ASSEMBLY CONTACTS THE BODY. IF THE PROCESS PRESSURE IS STILL EXERTING A FORCE ON THE PIVOT AFTER IT MOVES 5/64", THEN STOP TURNING THE TWO SCREWS. THE UNIT MAY HAVE DAMAGE THAT WILL ALLOW THE CONE TO DISENGAGE THE O-RING (8) AND THE PROCESS PRESSURE AND MEDIUM WILL ESCAPE THROUGH THE BODY. THE PROCESS PRESSURE WILL HAVE TO BE REMOVED FROM THE CAGE OR VESSEL BEFORE ANY FURTHER DISASSEMBLY IS POSSIBLE.

5.2.3 Replace the four hex socket head cap screws and tighten.

5.2.4 Reconnect the electrical switch leads.

## 6.0 DISASSEMBLY (Refer to figures 1 & 3)

### TOOLS REQUIRED:

- 7/16", 5/8", & 7/8" open end wrench or adjustable wrench
- 3/16" and 1/8" Allen wrenches
- pliers
- o-ring pick or small screwdriver

CAUTION: ONLY THE SWITCH ASSEMBLY AND PIVOT BODY CAN BE REMOVED FROM THE LEVEL SWITCH UNIT WITHOUT DEPRESSURIZING THE CAGE OR VESSEL. ANY FURTHER DISASSEMBLY WITH PRESSURE PRESENT ON THE CAGE OR VESSEL WILL RESULT IN SEVERE PERSONAL INJURY OR DAMAGE TO EQUIPMENT.

## 6.1 SWITCH REMOVAL

CAUTION: REMOVE AND LOCK OUT ALL ELECTRICAL POWER BEFORE WORKING ON ELECTRICAL SWITCH LEADS.

6.1.1 Disconnect all electrical switch lead connections. DO NOT attempt to remove the electric switch assembly until the leads are disconnected. Follow all applicable codes when working with electrical equipment, especially in areas that are classified as hazardous.

6.1.2 Using a 7/8" open end wrench or an adjustable wrench on the hex portion of the electric switch assembly to provide a proper back up, remove all conduit or enclosures attached to the electric switch



assembly. DO NOT use channel lock pliers, pipe wrenches, or etc. on the cylindrical portion of the electric switch assembly.

6.1.3 Taking care not to let the push rod (17) fall out of the electric switch assembly, remove the electric switch assembly from the pivot body (3) using the 7/8" wrench.

6.1.4 Pull the push rod out of the electric switch assembly. The electric switch assembly cannot be disassembled any further.

## 6.2 PIVOT BODY DISASSEMBLY

6.2.1 For pivot body removal from a non-pressurized cage or vessel use a 3/16" Allen wrench and remove the four hex socket head cap screws (1).

6.2.2 For pivot body removal from a pressurized cage or vessel use a 3/16" Allen wrench and remove the two of the hex socket head cap screws that are diagonally apart. . Replace the two hex socket head cap screws just removed with two 1/4" -20 screws or bolts that are 1-1/4" to 1-1/2" long. These serve as a safety stop in the event the level switch has received unknown damage. Rotate the remaining two screws one turn at a time, alternating between the two. The process pressure, acting on the end of the cone (14) that is protruding through the body, will move the pivot body outward as the two screws are turned. When the pivot body has stopped moving, remove the four screws completely.

**CAUTION: THE PIVOT BODY SHOULD MOVE OUTWARD APPROXIMATELY 1/16" AND STOP AS THE DISPLACER ASSEMBLY CONTACTS THE BODY. IF THE PROCESS PRESSURE IS STILL EXERTING A FORCE ON THE VALVE BODY AFTER IT MOVES 5/64", THEN STOP TURNING THE TWO SCREWS. THE UNIT MAY HAVE DAMAGE THAT WILL ALLOW THE CONE TO DISENGAGE THE O-RING (8) AND THE PROCESS PRESSURE AND MEDIUM WILL ESCAPE THROUGH THE BODY. THE PROCESS PRESSURE WILL HAVE TO BE REMOVED FROM THE CAGE OR VESSEL BEFORE ANY FURTHER DISASSEMBLY IS POSSIBLE.**

6.2.3 Remove the transverse rod from the pivot body.

6.2.4 Use pliers to hold the O.D. of the pivot point and rotate it counter clockwise to remove it from the pivot body.

6.2.5 The transverse rod wear rings should not be removed unless damage or an excessive amount of debris has accumulated on the transverse rod. These rings are split and may be removed similarly to O-ring removal. The wear rings are plastic and can be broken. Exercise care when removing them.

## 6.3 FULL DISASSEMBLY

**CAUTION: ALL PRESSURE MUST BE REMOVED FROM THE CAGE OR VESSEL BEFORE FULL DISASSEMBLY CAN BE PERFORMED. FAILURE TO REMOVE THE PRESSURE MAY RESULT IN PERSONAL INJURY OR DAMAGE TO EQUIPMENT.**

6.3.1 For full disassembly, it is necessary to completely remove the pressure from the cage or vessel the switch is installed in. All liquids should be drained to a position below the level switch.

6.3.2 Loosen and remove the level switch from the tank, vessel or cage that it is mounted to.



6.3.3 Hold the rod (11) with the pliers and rotate it counter-clockwise to remove it from the level switch.

6.3.4 Normally it is not necessary to remove the displacer assembly from the rod. If required, loosen the lock nut (10) and unthread the displacer assembly from the rod.

6.3.5 Follow instructions in Section 6.1 and 6.2 to remove and disassemble the switch and pivot body.

6.3.6 Use the 5/8" wrench and rotate the spring cap (4) counter clockwise to remove it from the body (7). Care should be taken no to lose the spring (5) and spring guide (6).

6.3.7 Push the threaded end of the cone (14) through the body.

6.3.8 Using an o-ring pick or small screwdriver remove the O-ring (8) form the body.

## 7.0 REPAIR AN ASSEMBLY REFER TO THE SWITCH DATA SHEET FOR REPLACEMENT PART NUMBERS

### TOOLS REQUIRED:

- 7/16", 5/8", & 7/8" open end wrench or adjustable wrench
- 3/16" and 1/8" Allen wrenches
- needle nose pliers
- pliers
- safety solvent
- silicone based o-ring lubricant

7.1 Using an appropriate safety solvent, clean all parts.

7.2 Inspect the I.D. of the transverse rod bore in the pivot body (13) and the O.D. of the transverse rod (16) for corrosion and excessive wear. The surface of the bore and the ramp on the transverse rod should have a mirror like appearance. Replace any worn or damaged parts.

7.3 Examine the push rod (17) for corrosion and excessive wear. Ensure that the tip is still pointed. Replace any worn or damaged parts.

7.4 If the level switch has a stainless steel displacer assembly, it should be free of dents, cracks or holes.

7.5 Re-install the wear rings if removed.

7.6 Install the push rod into the switch assembly and the transverse rod into the pivot body. Both should move freely. NOTE: Care should be taken not to lose these pieces while handling.

7.7 Thread and tighten the switch assembly (2) into the pivot body.

7.8 Install the body O-ring (8) into the body (7).

7.9 Thread the replacement pivot (13) onto the pivot body and tighten.



7.10 Lubricate the shaft and the treads on the treaded end of the cone. Install the cone into the body by turning the cone clockwise and pushing gently.

7.11 Align the tabs on the pivot body with the slots in the cone and slide the pivot body into the level switch body.

7.12 Align the valve body in the correct position for the desired low or high operation, see Figure 5. Install and tighten the four hex socket and head cap screws (1).

7.13 Thread the float rod onto the cone and tighten securely with pliers. If the displacer assembly was removed, reinstall and tighten the lock nut securely.

7.14 Insert the spring (5) and spring guide (6) into the spring cap. Install the spring cap into the body and tighten.

7.15 Replace the level switch assembly into the tank vessel or cage as per instructions in Section 3.0 INSTALLATION.

## 8.0 SWITCH CALIBRATION

8.1 Due to manufacturing tolerances or part wear, it may be necessary to adjust the length of the push rod (10) after installing an electric switch assembly (2).

8.2 Install the switch assembly per procedures in paragraph 7.6 and 7.7 of this manual.

8.3 Connect a suitable device to test switch continuity to the appropriate switch leads.

8.4 If the switch is not installed in a vessel it may be tested by raising and lowering the displacer assembly manually. For a switch installed in a vessel or external cage it is recommended to use the actual process fluid to check for proper switch operation.

8.5 Switches that are installed but not practical to operate with the process fluids may be tested by removing the spring cap (4) and the spring (5) then depressing and releasing the spring guide (6).

8.6 Should the switch operation have one of the malfunctions as given in the table of 8.7, use procedures given in paragraphs 8.8 thru 8.9 to calibrate the switch.

### 8.7

Switch Response	Calibration
N.O. contacts stay closed	Shorten Push Rod
N.O. contacts stay open	
N.O. contacts stay open	Lengthen Push Rod
N.O. contacts stay closed	

8.8 Remove the switch assembly and push rod per procedures in paragraphs 6.1.3 and 6.1.4.





8.9 Use pliers to hold the body of the push rod and a 5/64" Allen wrench to turn the set screw on the top of the push rod. Rotate the set screw approximately 30° counterclockwise to lengthen and clockwise to shorten the push rod.

8.10 Re-install the switch assembly and retest the level switch. Repeat these procedures as required until the switch functions properly.

#### 9.0 RECOMMENDED MAINTENANCE

PROCEDURE	INTERVAL
Test installed switch with process liquid to check for proper operation.	every 30 days
Replace body seal (8)	as required

#### TROUBLE SHOOTING:

PROBLEM	POSSIBLE CAUSES	RECOMMENDED ACTION
Level Switch does not function	Loose connection	Verify that the switch leads are properly terminated and all connections are tight.
	Damaged wiring	Check switch leads for cuts.
	Switch assembly (2) damaged	Follow procedures in section 6.0 and replace switch assembly.
	Debris accumulation on push rod (17), transverse rod (16) or under cone (14)	Follow procedures in sections 6.0 and 7.0 to disassemble and clean.
	Trash accumulation on displacer assembly (9).	Remove switch from vessel or cage per procedures in Section 6.3 and clean displacer.
	Level switch not installed properly. Spring cap not in the 'UP' position	Use instructions given in Section 3.0 to properly install the switch.
	Stainless steel displacer assembly (if used) damaged	Remove switch from vessel or cage per procedures in Section 6.3 and replace displacer assembly.
	Specific gravity of fluid too light for switch to function	Consult factory for optional Models available.
Liquid or gas leakage from body vent	Body seal (8) damaged or worn	Replace body seal (8) per instructions in Sections 6.0 & 7.0.



L80 PNEUMATIC VERTICAL



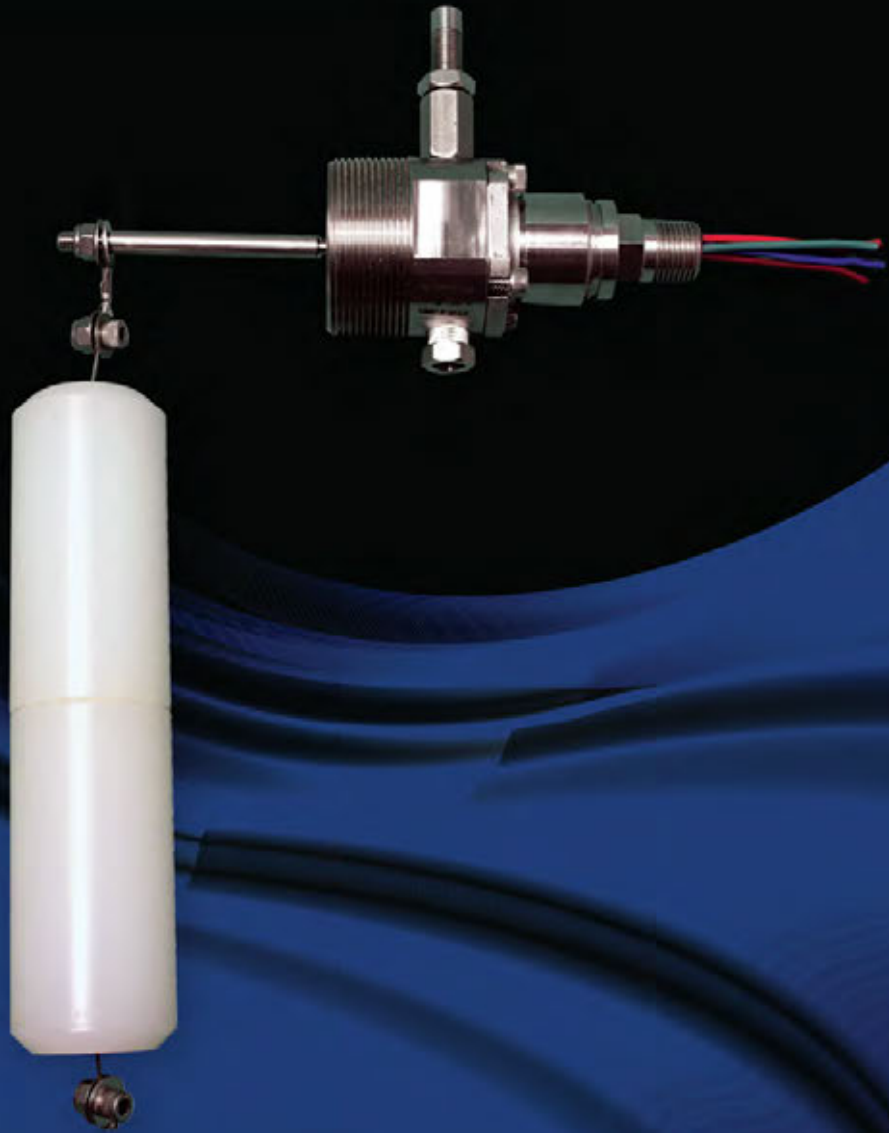
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**L80 ELECTRIC VERTICAL**



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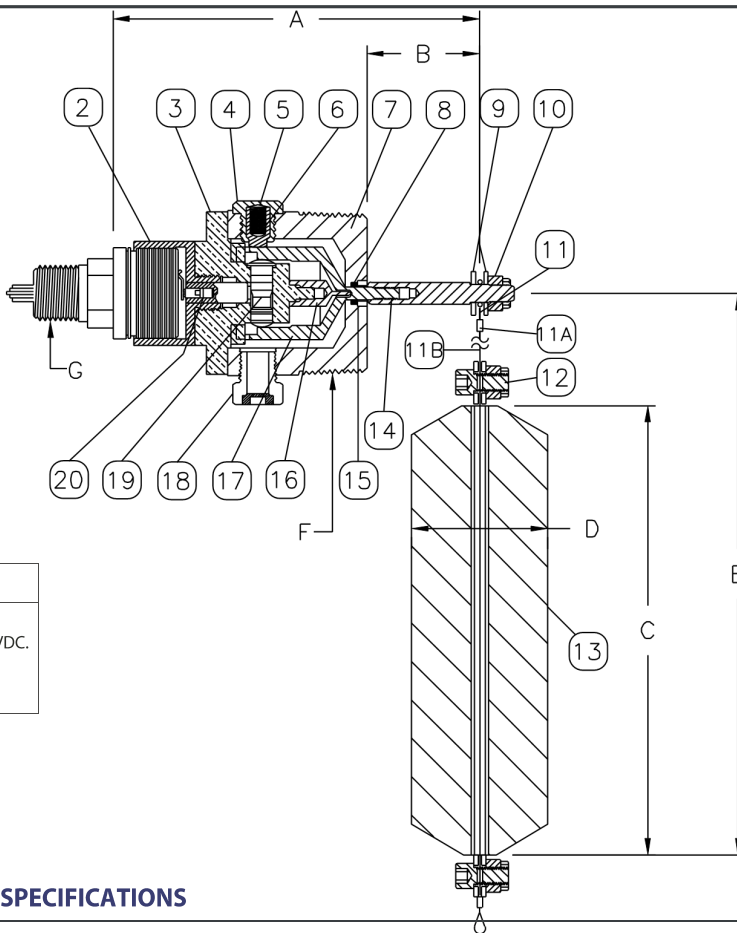
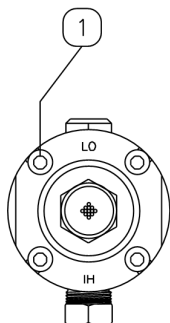


# MODEL L80 ELECTRIC VERTICAL

Designed for top mounting on a tank or vessel, this configuration of the 2" NPT thread mounted Model L80 level switch incorporates a vertical cable supported displacer. The trip point is easily adjusted by changing the location of the displacer along the available cable length. Factory installed explosion proof junction boxes with terminals are available.

## DIMENSIONS in. (mm)

A	5.90 (150)
B	1.70 (43)
C	12.0 (305)
D	2.00 (21)
E	1'-10"
F	2.00
G	1.37 (35)
Weight	4.6 Lbs (2.1 kg)



SWITCH	LOCATION	ELECTRICAL
	U.L. <sup>TM</sup> rated dry contact snap switch for hazardous locations Class I groups A, B, C & D Class II groups E, F & G	U.L. <sup>TM</sup> rated 11 Amps 1/4 HP @ 125/250 VAC. ; 5 Amps Res. @ 28 VDC. ; 5 Amps @ 125 VDC.

## Parts List for Level Switch L80

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	PART NO.
1	4	Socket Cap Screw	316 SST	TA-08K-0G3
2	1	SPDT Assy DPDT Assy	316 SST	88-030-000 88-031-000
3	1	Pivot Body	316 SST	88-017-000
4	1	Spring Cap	316 SST	30-012-000
5	1	Spring	Inconel X-750	30-014-000
6	1	Spring Guide	Acetal	30-008-000
7	1	2" NPT Body	316 SST	30-001-NB0
8	1	Body Seal	Fluorocarbon	VO-008-75H
9	2	Washers	316 SST	10-017-000
10	1	Lock Nut	316 SST	TB-08K-J43
11	1	Cable Assembly	Detailed Below	30-035-002
11A	2	Crimps	304 SS	30-063-000
11B	A/R	.046" Diameter Cable	316 SST	30-090-000
12	2	Grip Assembly	316 SST	80-011-000
13	1	Displacer Assembly	Polypropylene	80-063-000
14	1	Float Rod	316 SST	30-053-0A0
15	1	Seal Retainer	316 SST	30-007-0A0
16	1	Pivot	17-4 PH SST	30-079-000
17	1	Cone	17-4 PH SST	30-085-000
18	1	Body Vent	316 SST	99-010-000
19	1	Transverse Rod Assy	316 SST & PTFE	88-043-000
20	A/R	Push Rod Assembly	Acetal & 18-8 SS	88-028-000

## SPECIFICATIONS

Maximum Test Pressure PSI (BAR) @ 100° F (37° C)	3240 (223)
Maximum Working Pressure PSI (BAR) @ 100° F (37° C)	2160 (149)
Ambient Temperature Range	-20/+165° F -29/+74° C
Maximum Process Fluid Temperature	180° F (93° C)
Specific Gravity Range	0.6—1.4

## Ordering L80 3 P R

STANDARD	N.A.C.E.	316 & 17-4 PH ST. STEEL	FLUOROCARBON	BUNA-N (180° F)	POLYPROPYLENE (210° F)	SPDT SWITCH	DPDT SWITCH	HIGH (REVERSE ACTING)	NO OPTIONS	EXPLOSION PROOF JUNCTION BOX	ADJUSTABLE SPRING	NO ADJUSTMENT	FLOAT ROD 2=1.87, 6=3.25, 8=6.40	VERTICAL 1" TO 1' CABLE	VERTICAL 1' TO 5' CABLE	VERTICAL 5' TO 10' CABLE
—	N	3	V	B	P	S	D	R	0	C	A	N	X	1	2	3





**L81 PNEUMATIC**



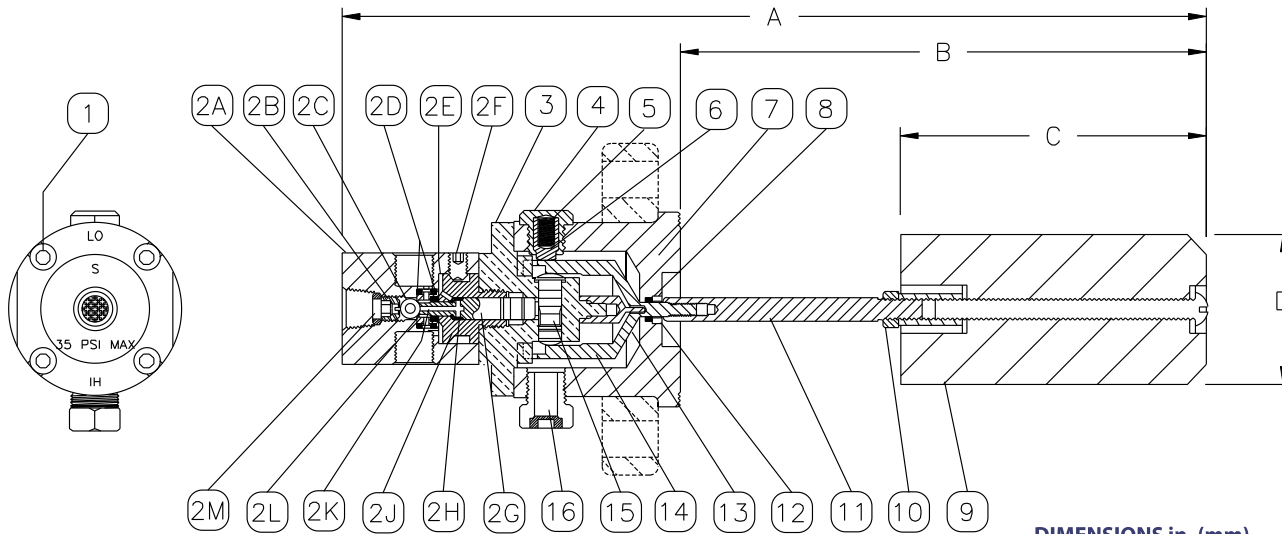
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# MODEL L81 FLANGE MOUNT PNEUMATIC

The L81 flange mount pneumatic level switch incorporates a slip ring mount configuration and ideal for applications where a positive process pressure seal is required. It utilizes a 3-way block and bleed valve and has an extended float rod for installation thru 2" or larger flanges.



## Parts List for Level Switch L81

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	PART NO.
1	4	Socket Cap Screw	316 SST	TA-08K-0G3
2	1	Valve Assembly	Detailed Below	88-008-0B0
2A	1	Valve Body	316 SST	80-005-0A0
2B	1	Ball Retainer	18-8 SST	80-024-000
2C	1	Ball	Tungsten Carbide	BL-250-25T
2D	2	Seat O-Ring	Fluorocarbon	V0-012-75H
2E	1	Body O-Ring	Fluorocarbon	V0-019-75H
2F	3	Set Screw	18-8 SST	T9-08K-0C4
2G	1	Valve Stem Assembly	316 SST, Acetal & PTFE	80-018-000
2H	1	Valve Stem Spring	316 SST	80-035-000
2J	1	Adaptor Head	316 SST	80-004-000
2K	1	Valve Stem O-Ring	Fluorosilicone	FO-008-70T
2L	1	Seat	316 SST	80-006-000
2M	1	Filter Disk	316 SST	80-053-000
3	1	Pivot Body	316 SST	80-017-000
4	1	Spring Cap	316 SST	30-012-000
5	1	Spring	Inconel X-750	30-014-000
6	1	Spring Guide	Acetal	30-008-000
7	1	Flanged Body	316 SST	31-002-0B0
8	1	Body Seal	Fluorocarbon	V0-008-75H
9	1	Displacer Assembly	Polypropylene & 316 SST	30-016-000 30-068-000
10	1	Hex Nut	316 SST	T6-08K-073
11	1	Float Rod	316 SST	30-005-0A0
12	1	Seal Retainer	316 SST	30-007-0A0
13	1	Pivot	17-4 PH SST	30-079-000
14	1	Cone	17-4 PH SST	30-085-000
15	1	Transverse Rod Assy	316 SST & PTFE	88-043-000
16	1	Body Vent	316 SST & Fluorocarbon	99-010-000
17	---	Repair Kit	Items: 2C,D,E,H,K,M,8,13	80-020-000

## DIMENSIONS in. (mm)

A	11.70 (297)
B	7.10 ((180)
C	4.10 (104)
D	2.00 (50)
Weight	4.1 Lbs (1.86 kg)

## SPECIFICATIONS

Maximum Test Pressure PSI (BAR) @ 100° F (37° C)	3240 (223)
Maximum Working Pressure PSI (BAR) @ 100° F (37° C)	2160 (149)
Ambient Temperature Range	-20/+180° F -29/+82° C
Maximum Process Fluid Temperature	180° F (93° C)
Minimum Specific Gravity	0.6
Supply Pressure PSI (BAR)	35 (2.41)
Valve Cv Factor	0.042

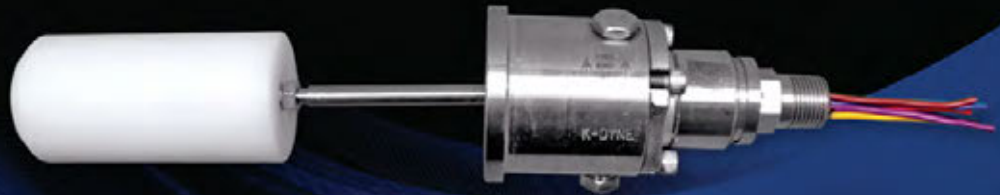
## Ordering Number L81

STANDARD	N.A.C.E.	316 & 17-4 PH ST. STEEL	FLUOROCARBON	BUNA-N (180° F)	KALREZ (450° F)	POLYPROPYLENE (210° F)	316 SST DISPLACER (450° F)	3-WAY PNEUMATIC VALVE	LOW (DIRECT ACTING)	HIGH (REVERSE ACTING)	NO OPTIONS	ADJUSTABLE SPRING	NO ADJUSTMENT	FLOAT ROD 2=1.87, 6=3.25, 8=6.40, 10 = 12.25"	HORIZONTAL
—	N	3	V	B	K	P	3	V	D	R	0	A	N	X	H





L81 ELECTRIC



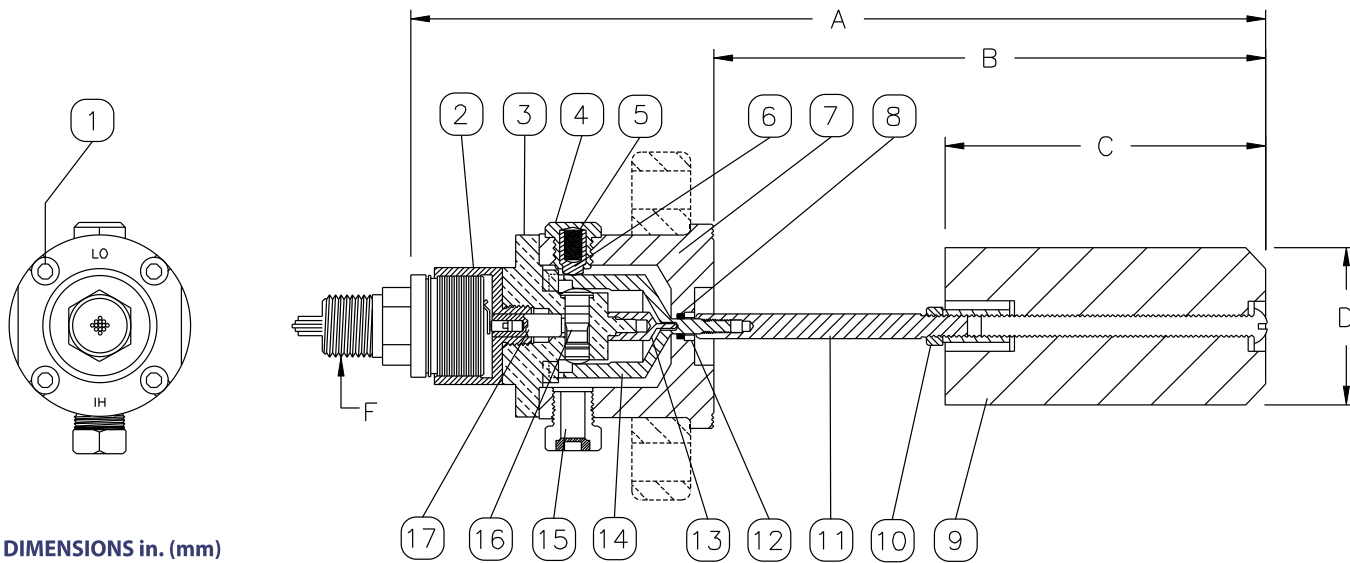
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# MODEL L81 FLANGE MOUNT ELECTRIC

The L81 flange mount electric level switch incorporates a slip ring mount configuration and ideal for applications where a positive process pressure seal is required. It utilizes an explosion proof SPDT or DPDT snap acting dry contact switch and has an extended float rod for installation thru 2" or larger flanges.



### DIMENSIONS in. (mm)

A	11.05 (280)
B	7.10 ((180)
C	4.10 (104)
D	2.00 (50)
F	1/2" NPT (M)
Weight	4.1 Lbs (1.86 kg)

	LOCATION	ELECTRICAL
<b>SWITCH</b>	U.L.™ rated dry contact snap switch for hazardous locations Class I groups A, B, C & D Class II groups E, F & G: Hermetically Sealed, NEMA 7 & 9	U.L.™ rated 11 Amps 1/4 HP @ 125/250 VAC.; 5 Amps Res./3 Amps Ind. @ 28 VDC.; .5 Amps Res./25 Amps Ind @ 125 VDC 18 AWG x 18" leads

### SPECIFICATIONS

Maximum Test Pressure PSI (BAR) @ 100° F (37° C)	3240 (223)
Maximum Working Pressure PSI (BAR) @ 100° F (37° C)	2160 (149)
Ambient Temperature Range	-20/+165° F -29/+74° C
Maximum Process Fluid Temperature	180° F (93° C)
Minimum Specific Gravity	0.6

### Parts List for Level Switch L81

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	PART NO.
1	4	Socket Cap Screw	316 SST	TA-08K-0G3
2	1	DPDT Assembly SPDT Assembly	316 SST	88-031-000 88-030-000
3	1	Pivot Body	316 SST	80-017-000
4	1	Spring Cap	316 SST	30-012-000
5	1	Spring	Inconel X-750	30-014-000
6	1	Spring Guide	Acetal	30-008-000
7	1	Flanged Body	316 SST	31-002-0B0
8	1	Body Seal	Fluorocarbon	V0-008-75H
9	1	Displacer Assembly	Polypropylene 316 SST	30-016-000 30-068-000
10	1	Hex Nut	316 SST	T6-08K-073
11	1	Float Rod	316 SST	30-005-0A0
12	1	Seal Retainer	316 SST	30-007-0A0
13	1	Pivot	17-4 PH SST	30-079-000
14	1	Cone	17-4 PH SST	30-085-000
15	1	Body Vent	316 SST	99-010-000
16	1	Transverse Rod Assy	316 SST & PTFE	88-043-000
17	1	Push Rod Assembly	Acetal & 18-8 SST	88-028-000

### Ordering Number L81 3 H

STANDARD	N.A.C.E.	316 & 17-4 PH ST. STEEL	FLUOROCARBON	BUNA-N (180° F)	KALREZ (450° F)	POLYPROPYLENE (210° F)	316 SST DISPLACER (450° F)	SPDT SWITCH	DPDT SWITCH	LOW (DIRECT ACTING)	HIGH (REVERSE ACTING)	NO OPTIONS	EXPLOSION PROOF	ADJUSTABLE SPRING	NO ADJUSTMENT	FLOAT ROD 2=1.87, 6=3.25, 8=6.40, 10=12.25"	HORIZONTAL
-	N	3	V	B	K	P	3	S	D	D	R	0	C	A	N	X	H



**L82 PNEUMATIC**



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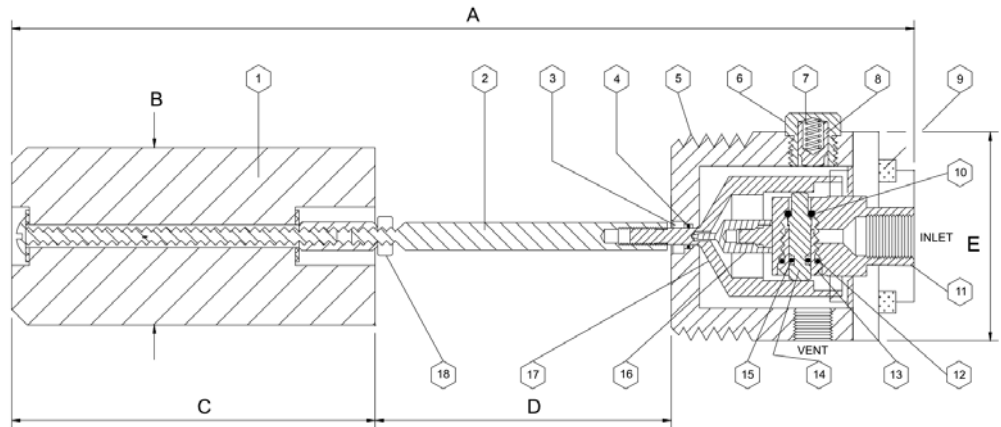


# MODEL L82 PNEUMATIC

The Model L82 switch incorporates a pneumatic 2-way valve, providing positive and fast system response. Its design has a non-adjustable trip point and narrow level operation range making it perfect for applications where trip point tampering is unacceptable. An internal stainless steel supply gas filter reduces maintenance requirements.

## DIMENSIONS in. (mm)

A	10.06 (255.5)
B	7.35 (187)
C	4.10 (104)
D	2.00 (50)
Weight	3.6 Lbs (1.64 kg)



## Parts List for Level Switch L82

ITEM NO.	QTY.	DESCRIPTION	MATERIAL
1	1	Displacer Assembly	Polypropylene & 18-8 SST.
2	1	Float Rod	316 SST
3	1	Body Seal Retainer	316 SST
4	1	Body Seal	Fluorocarbon
5	1	Body	316 SST
6	1	Spring Cap	316 SST
7	1	Spring	Iconel
8	1	Spring Guide	Acetal
9	4	Socket HD Cap Screw	316 SST
10	1	Valve Seat	Fluorocarbon
11	1	Valve Body	316 SST
12	1	Valve Retainer Seal	Fluorocarbon
13	1	Valve Retainer	316 SST
14	1	Valve Poppet	316 SST
15	1	Poppet Seal	Fluorosilicone
16	1	Pivot	304 SST
17	1	Cone	17-4 PH SST
18	1	Float Rod Nut	316 SST
19	-	Repair Kit	Items 4, 10, 12 & 15

## SPECIFICATIONS

Maximum Test Pressure PSI (BAR) @ 100° F (37° C)	3240 (223)
Maximum Working Pressure PSI (BAR) @ 100° F (37° C)	2160 (149)
Ambient Temperature Range	-20/+180° F -29/+82° C
Maximum Process Fluid Temperature	180° F (93° C) 450° F (232° C)
Minimum Specific Gravity	0.6
Maximum Supply Pressure PSI (BAR)	50 (3.44)
Valve Cv Factor	0.042

## Ordering Number L823320H

STANDARD	N.A.C.E.	HIGH TEMP (+180° F)	316 & 17-4 PH ST. STEEL	FLUOROCARBON	BUNA-N (180° F)	KALREZ (450° F)	POLYPROPYLENE (210° F)	316 SST DISPLACER (450° F)	2-WAY PNEUMATIC VALVE	HIGH (REVERSE ACTING)	LOW (DIRECT ACTION)	NO OPTIONS	ADJUSTABLE SPRING	NO ADJUSTMENT	FLOAT ROD 2=1.87, 6=3.25, 8=6.40, 10=12.25"	HORIZONTAL
—	N	H	3	V	B	K	P	3	2	R	D	0	A	N	X	H



**F81 MOUNTING FLANGE**



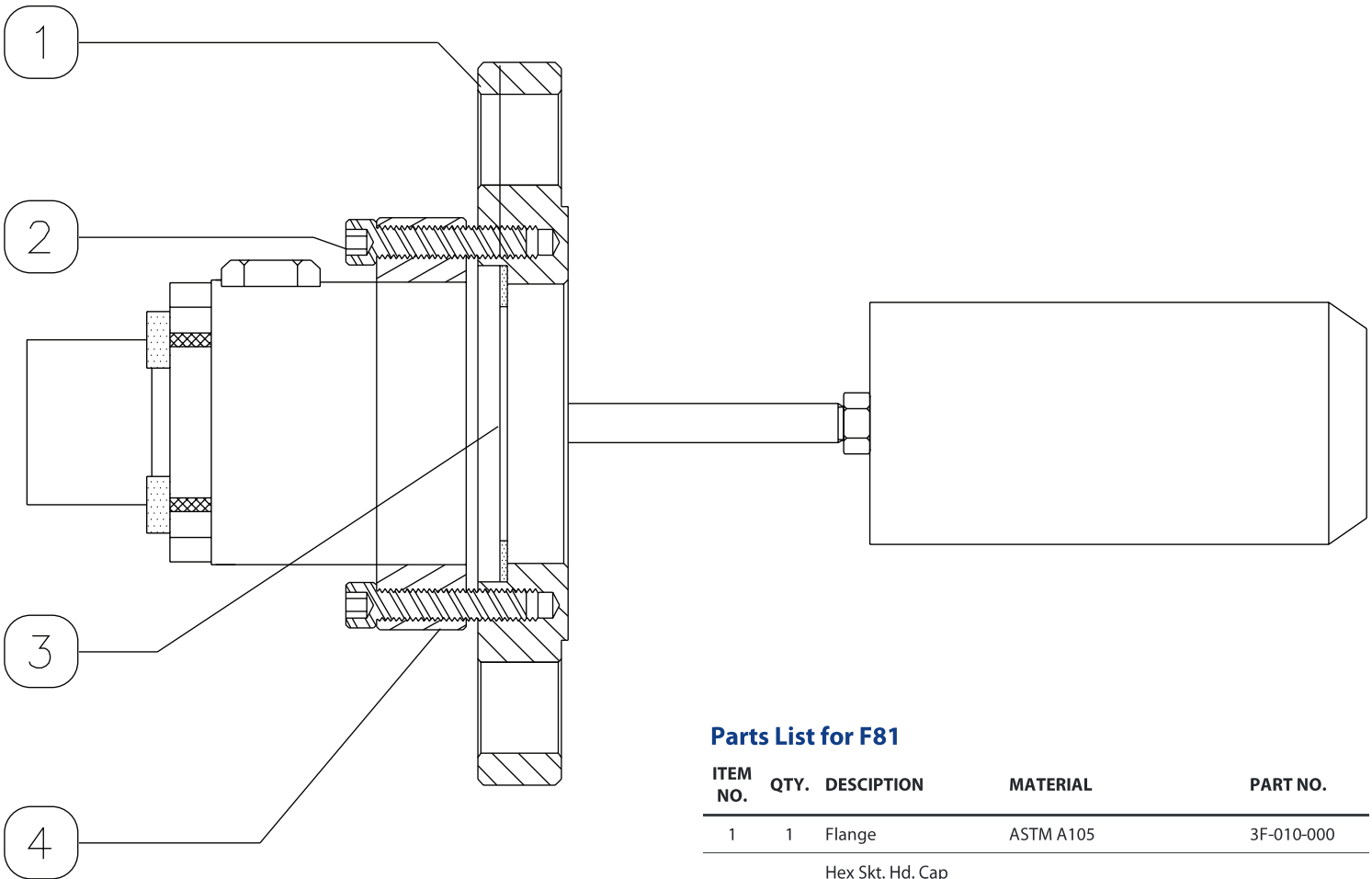
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# MODEL F81 MOUNTING FLANGE

The F81 model mounting flanges are designed specifically for mounting the K-Dyne Model L81 pneumatic or electric level switches. They provide non-threaded process connections for applications where a positive pressure seal is required. This design is well suited for mounting the level switch directly to a tank or pressurized vessel eliminating the need for any external piping.



### Parts List for F81

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	PART NO.
1	1	Flange	ASTM A105	3F-010-000
2	8	Hex Skt. Hd. Cap Screw	SAE Gr 8	TA-08K-187
3	1	Switch Body Gasket	Blue Guard	31-019-000
4	1	Slip Ring	ASTM A108 Gr 1018	31-020-000
5	---	Repair Kit	Items 2 & 3	31-071-RKC

## Ordering Number F81-FC0GCC0

2" ANSI, 150 RF	3" ANSI, 150 RF	4" ANSI, 150 RF	6" ANSI, 150 RF	2" ANSI 300 RF	3" ANSI 300 RF	4" ANSI 300 RF	6" ANSI 300 RF	2" ANSI 600 RF	3" ANSI 600 RF	4" ANSI 600 RF	6" ANSI 600 RF
21	31	41	61	23	33	43	63	26	36	46	66



**C80 EXTERNAL FLOAT CHAMBER**



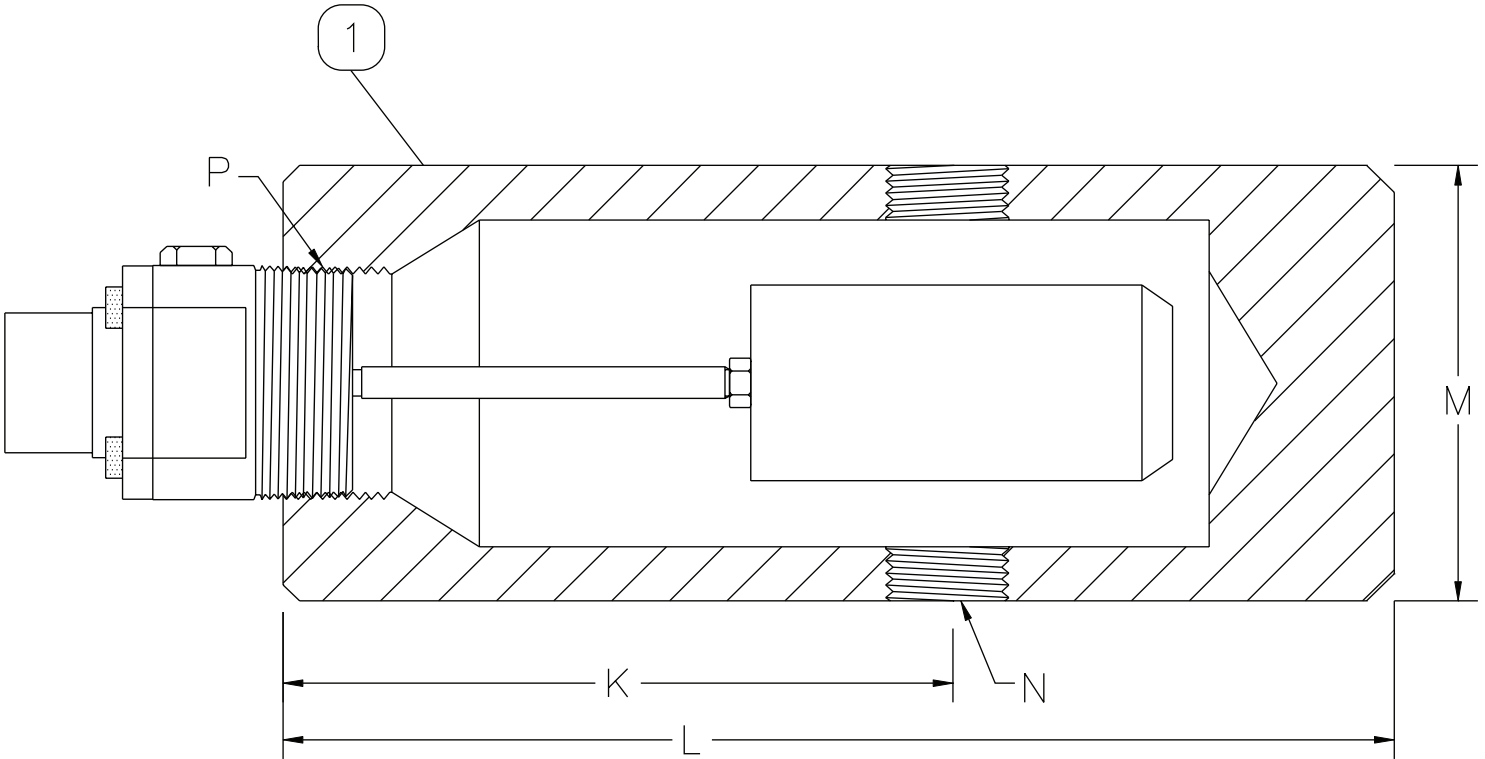
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# MODEL C80 EXTERNAL FLOAT CHAMBER

The C80 external cage is specifically designed for use with the K-Dyne Model L80 pneumatic and electric level switches. This unit is ideal for externally mounting of a level switch to a tank or vessel where the distance between process piping connections is at a minimum.



## Parts List for C80

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	PART NO.
1	1	Cage Body	ASTMA A-108 Gr 1018 Wrought Stl.	3C-001-000

## DIMENSIONS in. (mm)

K	6.10 (155)
L	10.2 (259)
M	4.5 (114)
N	1" NPT (F)
P	2" NPT (F)
Weight	28 Lbs (12.7 kg)

## SPECIFICATIONS

Maximum Test Pressure PSI (BAR) @ 100° F (37° C)	3240 (223)
Maximum Working Pressure PSI (BAR) @ 100° F (37° C)	2160 (149)
Operating Temperature Range	-20/+500° F -29/+260° C

## Model Number C80

STANDARD	N.A.C.E.	HORIZONTAL	TOP/BOTTOM PROCESS PORTS	CARBON STEEL	316 ST. STEEL	NO COATING (STD)	ANSI 900	1" CONNECTION SIZE	THREADED	NO SPECIAL FEATURES
—	N	H	T0	1	3	0	9	1	T	0



**C8R REDUCED WEIGHT FLOAT CHAMBER**



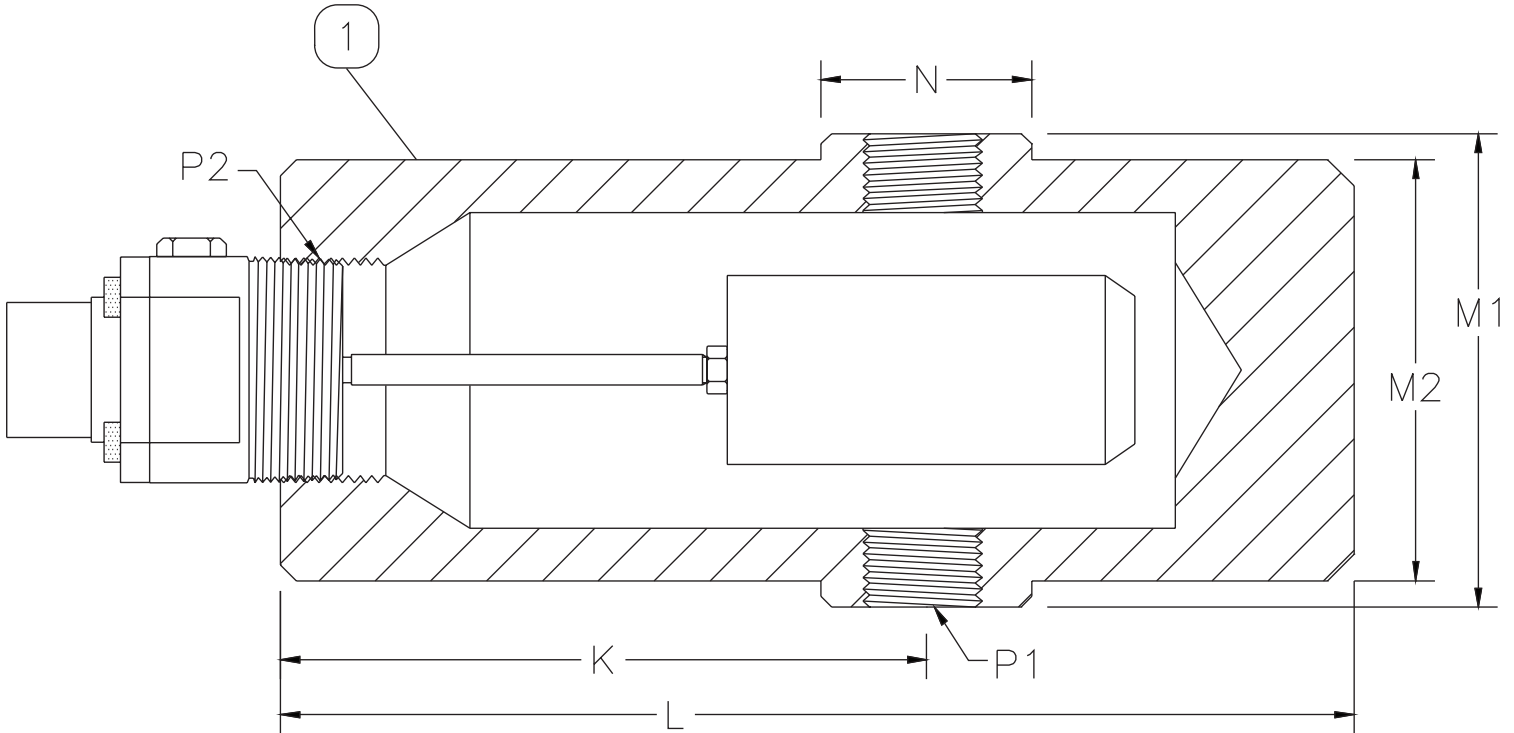
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# MODEL C8R REDUCED WEIGHT FLOAT CHAMBER

The C8R external cage is specifically designed for use with the K-Dyne Model L80 pneumatic and electric level switches. This reduced weight model was designed for weight savings on floating or tension type production platforms. This C8R is ideal for externally mounting of a level switch to a tank or vessel where the distance between process piping connections is at a minimum.



## Parts List for C8R

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	PART NO.
1	1	Cage Body	ASTMA A-108 Gr 1018 Stl.	3C-004-000

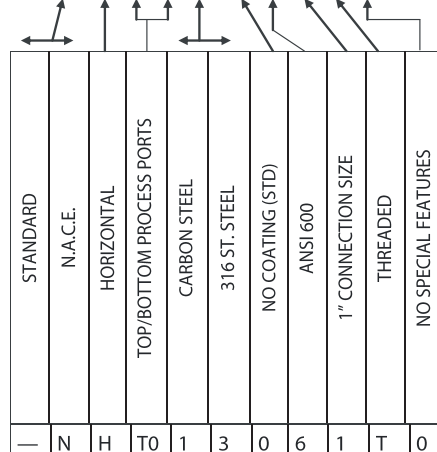
## DIMENSIONS in. (mm)

K	6.10 (155)
L	10.2 (259)
M1/M2	4.5 (114)/4.0 (101)
N	2.0 (50.8)
P1/P2	1" NPT/2" NPT
Weight	22 Lbs (9.9 kg)

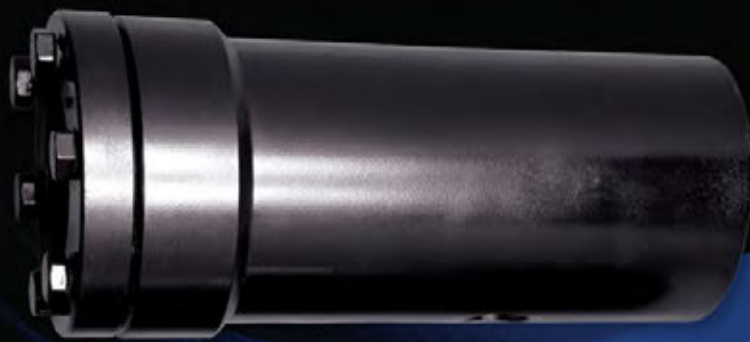
## SPECIFICATIONS

Maximum Test Pressure PSI (BAR) @ 100° F (37° C)	2160 (149)
Maximum Working Pressure PSI (BAR) @ 100° F (37° C)	1440 (99)
Operating Temperature Range	-20/+500° F -29/+260° C

## Model Number C8R



**C81 FLANGED FLOAT CHAMBER**



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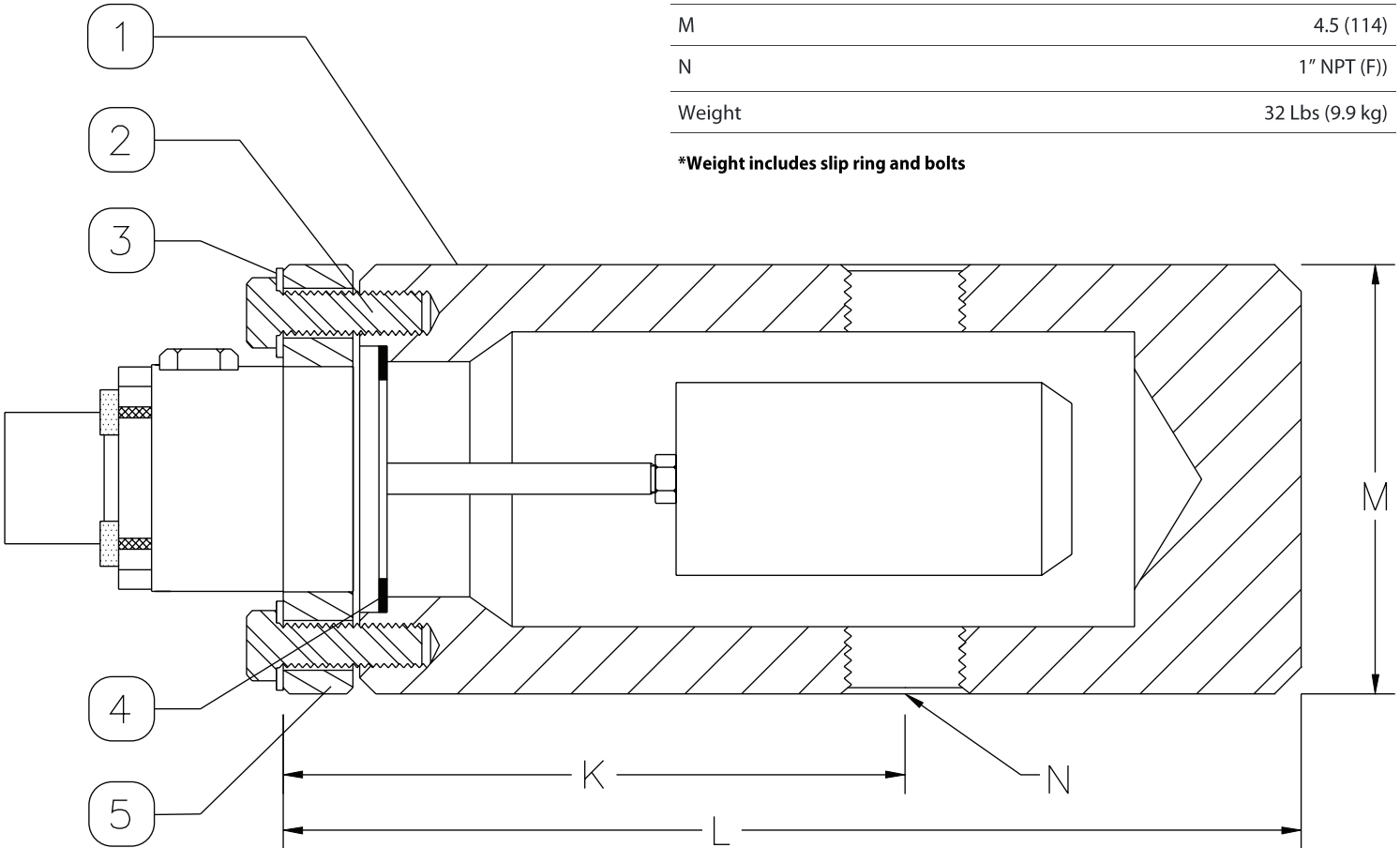
# MODEL C81 FLANGED FLOAT CHAMBER

The C81 external cage is specifically designed for use with the K-Dyne Model L81 pneumatic or electric level switches. The flange/slip ring process pressure sealing configuration provides a reliable and easy to maintain unit. .

## DIMENSIONS in. (mm)

K	6.48 (165)
L	10.6 (269)
M	4.5 (114)
N	1" NPT (F))
Weight	32 Lbs (9.9 kg)

\*Weight includes slip ring and bolts



## Ordering Number C81

STANDARD	N.A.C.E.	HORIZONTAL	TOP/BOTTOM PROCESS PORTS	CARBON STEEL	316 ST. STEEL	NO COATING (STD)	ANSI 900	1" CONNECTION SIZE	THREADED	FIBER GASKET, CS SLIP RING, BOLTS & WASHERS
—	N	H	T0	1	3	0	9	1	T	C

## Parts List for Flange C81

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	PART NO.
1	1	Cage	ASTM A108 Gr 1018	3c-006-000
2	6	Hex Head Cap Screw	SAE Grd. 8	T7-0EE-1G7
3	6	Washer	Carbon Steel	WB-AT0-U46
4	1	Switch Body Gasket	Blue Guard	31-019-000
5	1	Slip Ring	ASTM A108 Gr 1018	31-003-000

## SPECIFICATIONS

Maximum Test Pressure PSI (BAR) @ 100° F (37° C)	3240 (223)
Maximum Working Pressure PSI (BAR) @ 100° F (37° C)	2160 (149)
Operating Temperature Range	-20/+500° F -29/+260° C



**T80 THREADED TOP MOUNT ADAPTOR**



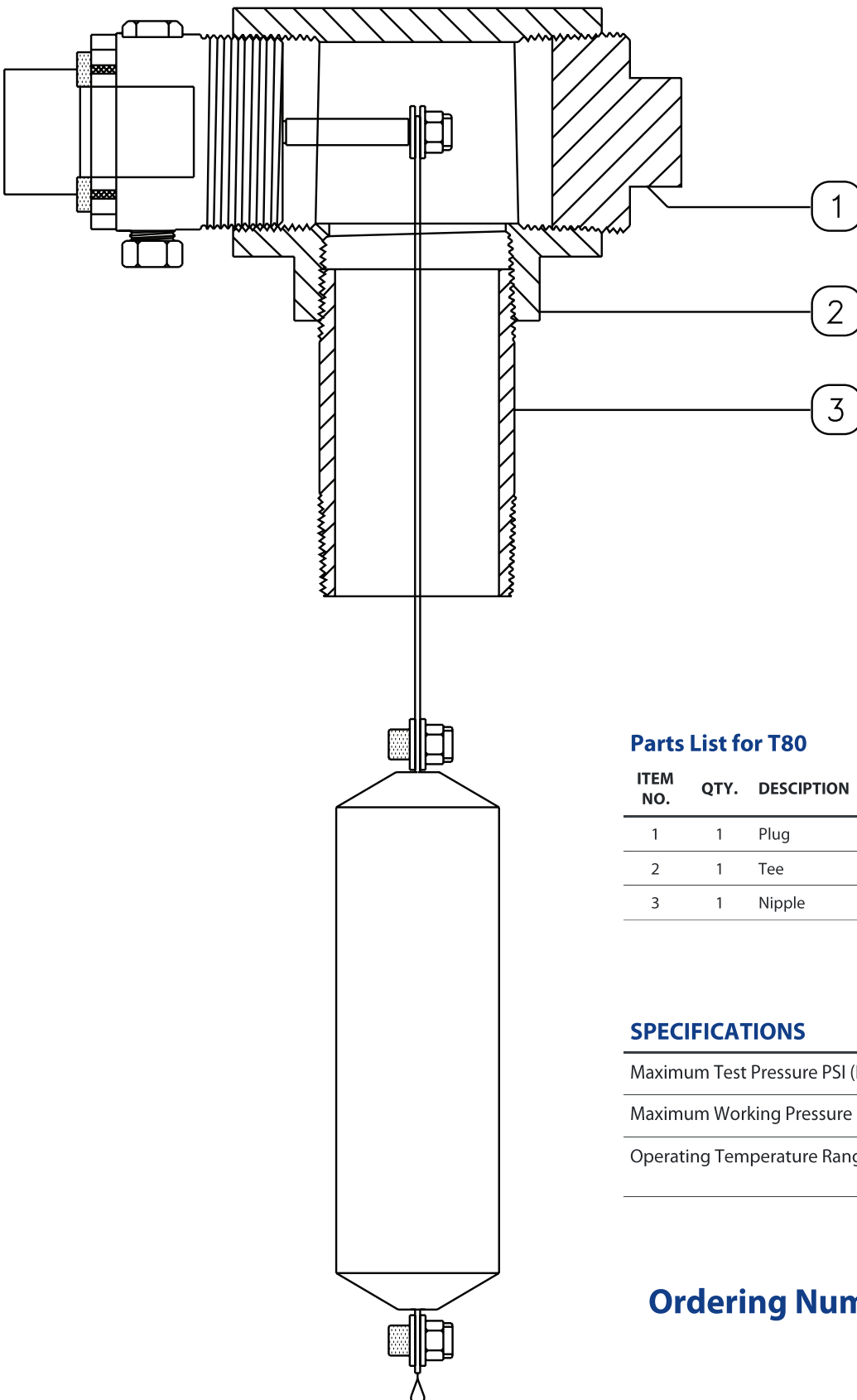
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# MODEL T80 THREADED TOP MOUNT ADAPTOR

The T80 Top Mount Threaded Adaptor is designed specifically for mounting the K-Dyne Model L80 pneumatic and electric level switches with vertical displacers. Incorporating a 2" NPT thread, this design is well suited for mounting the level switch directly to a tank or pressurized



## Parts List for T80

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	PART NO.
1	1	Plug	Malleable Iron	LP-4C200SP
2	1	Tee	Malleable Iron	LP-4C222FT
3	1	Nipple	Carbon Steel	LP-4C204PN

## SPECIFICATIONS

Maximum Test Pressure PSI (BAR) @ 100° F (37° C)	425 (29)
Maximum Working Pressure PSI (BAR) @ 100° F (37° C)	275 (19)
Operating Temperature Range	See Level Switch Range

**Ordering Number T80-21TC00004**





**T80 FLANGED TOP MOUNT ADAPTOR**



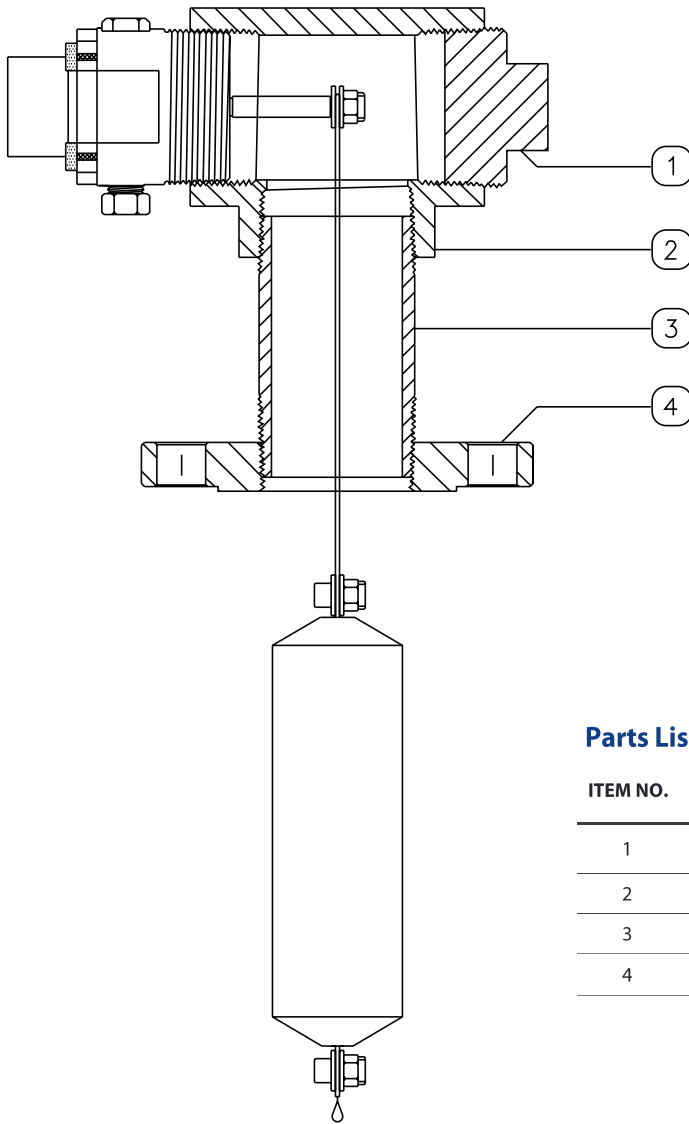
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# MODEL T80 FLANGED TOP MOUNT ADAPTOR

The T80 Top Mount Adaptor Flanges are designed specifically for mounting the K-Dyne Model L80 pneumatic and electric level switches with vertical displacers. Incorporating an ANSI flange, this design is well suited for mounting the level switch directly to a tank or pressurized vessel eliminating the need for any external piping.



## Parts List for T80

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	PART NO.
1	1	Plug	Malleable Iron	LP-4C200SP
2	1	Tee	Malleable Iron	LP-4C222FT
3	1	Nipple	Carbon Steel	LP-4C204PN
4	1	Flange	ASTM A105	3F-018-000

## Ordering Number

**T80-□□FC00004**

2" SIZE	3" SIZE	4" SIZE	6" SIZE	ANSI 150	ANSI 300
2	3	4	6	1	3

## SPECIFICATIONS

Maximum Test Pressure PSI (BAR) @ 100° F (37° C)	425 (29)
Maximum Working Pressure PSI (BAR) @ 100° F (37° C)	275 (19)
Operating Temperature Range	See Level Switch Range



**P40 PRESSURE SWITCH**



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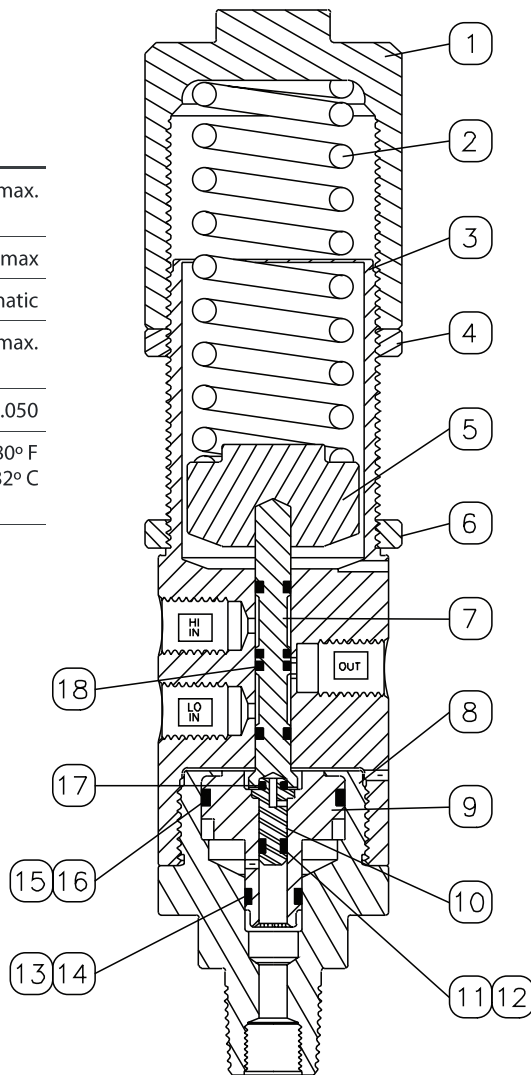


# MODEL P40 PRESSURE SWITCH

The K-Dyne Model P40 Pneumatic Pressure Switch functions as a 3-way “block and bleed” valve that can be configured to respond to increasing or decreasing process pressures. The standard unit utilizes a patented system which provides three piston diameters that are selected by simply changing the orientation of on part. When used in combination with one of three available spring sizes, the Model P40 offers sensing ranges from 10-10,000 psi.

## SPECIFICATIONS

Set Point Deviation	±1% max.
Deadband	5% of range max
Switch Type	3-way pneumatic
Instrument Pressure	1500 psi max.
Valve Cv Factor	.050
Ambient Temperature Range	-20/+180° F -29/+82° C



## Parts List for P40 Pressure

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	PART NO.
1	1	Spring Cap	Delrin 507	40-005-000
2A	1	Spring (White)	ASTM-401	40-001-000
2B	1	Spring (Blue)	ASTM-401	40-002-000
2C	1	Spring (Red)	ASTM-401	40-003-000
3	1	Body	AISI 316 St. Stl.	40-012-000
4	1	Lock Ring	Delrin 507	40-010-000
5	1	Spring Plate	Delrin 507	40-006-000
6	1	Panel Mount Ring (opt)	Delrin 507	40-010-000
7	1	Spool	AISI 316 St. Stl.	40-004-000
8	1	Base	AISI 316 St. Stl.	40-007-000
9	1	1.25"/.50" Piston (Lg)	AISI 316 St. Stl.	40-008-000
10	1	.25" Piston (Small)	AISI 316 St. St.	40-009-000
11	1	O-Ring .25" Piston	Fluorocarbon	VO-006-75T
12	1	Back Up .25" Piston	PTFE	TB-006-00C
13	1	O-Ring .50" Piston	Fluorocarbon	VO-012-75T
14	1	Back Up .50" Piston	PTFE	TB-012-00C
15	1	O-Ring 1.25" Piston	Fluorocarbon	VO-024-75T
16	1	Back Up 1.25" Piston	PTFE	TB-024-00C
17	1	Friction Seal	Fluorocarbon	VO-006-75H
18	4	Spool Seal	Fluorocarbon	VQ-008-75T
19	---	Repair Kit	Items 11 thru 18	40-013-000

## Ordering Number

P40  P    00

STANDARD SERVICE	-40° F TEMP SERVICE	+300° F TEMP SERVICE	+150 PSI SUPPLY	AISI 316 ST. STL	INCONEL 625	MONEL	HASTELLOY C	SPRING CODE (SEE RANGE CHART)	PISTON CODE (SEE RANGE CHART)	FLUOROCARBON PISTON SEALS (STD) --20° -300° F	KALREZ PISTON SEALS --20° -450° F	BUNA PISTON SEALS (NOT FOR H2S) --20° -450° F	NO SPECIAL FEATURES	VENT PORT INDICATOR	VENT SCREEN	PANEL MOUNT	SCALE	OPTION P & S (PANEL MOUNT & SCALE)
-	L	H	P	3	I	M	H			V	K	B	0	1	2	P	S	T

## RANGE CHART

Spring Codes Color	AVAILABLE RANGES—PSI (BAR)									
	Standard Spring	10-115	20-230	50-450	200-750	500-1500	1000-3000	1000-3000	2000-5000	5000-10000
W (White)	X				X			X		
B (Blue)		X				X			X	
R (Red)			X				X			X
Piston Diameter	1.25"	1.25"	1.25"	.50"	.50"	.50"	.25"	.25"	.25"	.25"
Piston Code	1	1	1	2	2	2	3	3	3	3

- 10,000—20,000 PSI Consult Factory
- 1-9 PSI Consult Factory



## P40 MANIFOLD ASSEMBLY



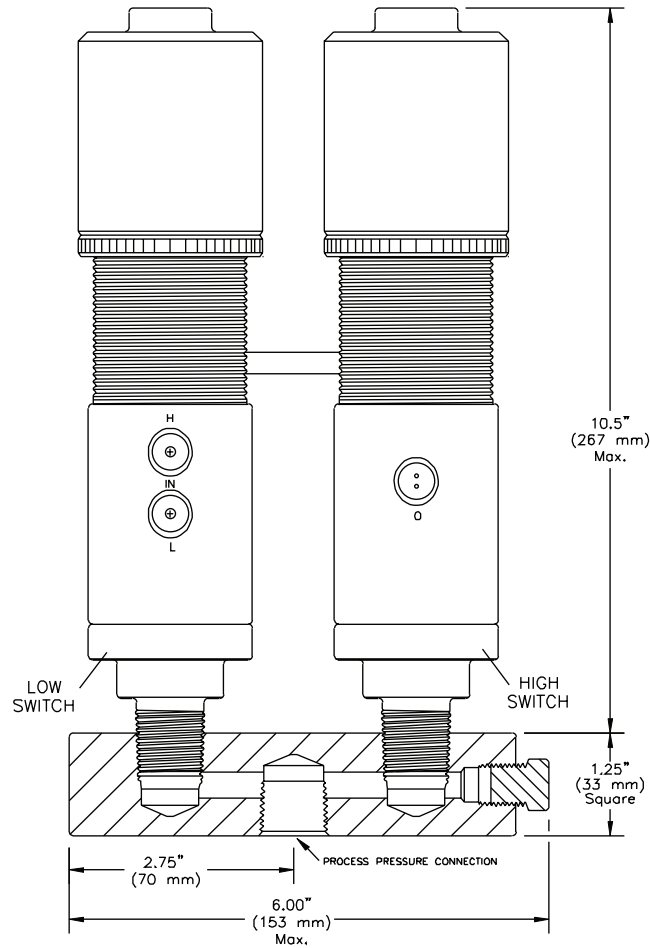
[www.k-dyne.com](http://www.k-dyne.com)

702 South Persimmon, Suite 1C  
Tomball, TX 77375  
P: 281.397.7099  
F: 281.397.7495



# MODEL P40 MANIFOLD ASSEMBLY

The K-Dyne Model P40 Manifold Assembly incorporates two Model P40 Pneumatic Pressure Switches mounted on a rugged ported base with the instrument tubing jumper installed between the low and high switches. This jumper allows the assembly to sense high and low set pressures using one process connection. An additional port on the manifold may be used as a test connection or gauge port.



## SPECIFICATIONS

Sensor Ports	1/2" NPT (F)
Test Port	1/4" NPT (F)
Maz. Operating Pressure	10,000 PSI (690 BAR)
Burst Pressure	20,000 PSI (1380 BAR)

## RANGE CHART

Spring Codes Color	AVAILABLE RANGES—PSI (BAR)								
	10-115	20-230	50-450	200-750	500-1500	1000-3000	1000-3000	2000-5000	5000-10000
Standard Spring									
W (White)	X			X			X		
B (Blue)		X			X			X	
R (Red)			X			X			X
Piston Diameter	1.25"	1.25"	1.25"	.50"	.50"	.50"	.25"	.25"	.25"
Piston Code	1	1	1	2	2	2	3	3	3

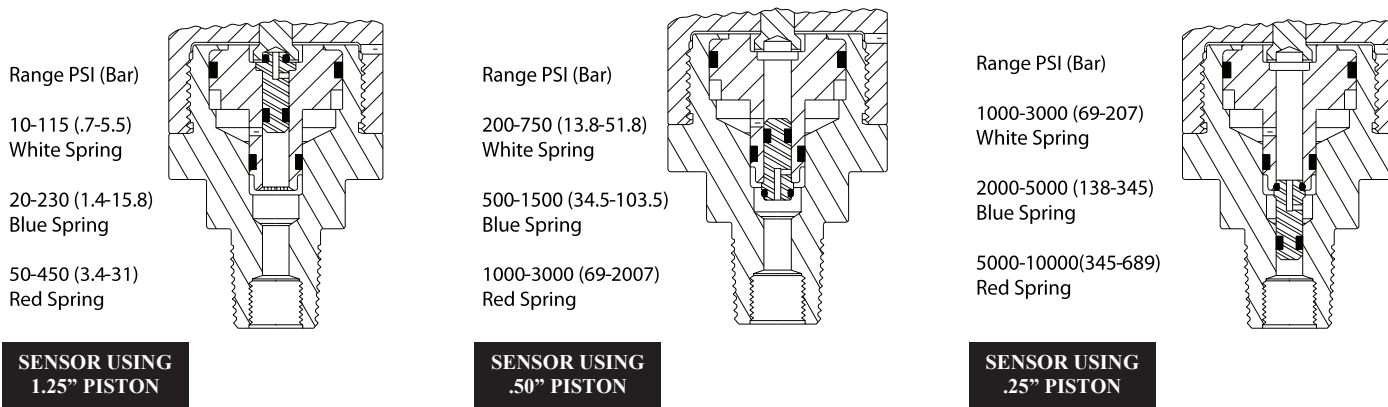
- 10,000—20,000 PSI Consult Factory
- 1-9 PSI Consult Factory





# MODEL P40 OPERATION MANUAL

The K-Dyne Model P40 Pneumatic Pressure Switch functions as a 3-way “block and bleed” valve that can be configured to respond to increasing or decreasing process pressures. The standard unit utilizes a patented system which provides three piston diameters that are selected by simply changing the orientation of on part. When used in combination with one of three available spring sizes, the Model P40 offers sensing ranges from 10-10,000 psi. without the purchase of additional bases or pistons.



In order to achieve the highest performance from the pressure switch, the correct spring and piston arrangement must be chosen. K-Dyne offers nine available pressure ranges. In order to achieve the highest performance and lowest deadband, the desired pressure setting should be in the middle of one of the pressure settings.

The Model P40 incorporates two pistons and three piston diameters. The diameters of the main (large) piston are .50" and 1.25". The diameter of the secondary (small) piston is .25". In order to work off of the 1.25" diameter, the secondary piston is placed in the top of the main piston. If the .50" diameter is required, the secondary is placed in the bottom of the main piston. When working off of the .25" diameter, the secondary piston is placed in the bottom of the pilot base (black o-ring up) and place main piston into pilot base. Please see piston arrangements below.

Depending on the pressure setting, the K-Dyne pressure switch uses three different springs. Spring choices are white, blue, and red. Please see range chart for piston and spring choices.

## RANGE CHART

Spring Codes Color	AVAILABLE RANGES—PSI (BAR)								
	10-115	20-230	50-450	200-750	500-1500	1000-3000	1000-3000	2000-5000	5000-10000
Standard									
W (White)	X			X			X		
B (Blue)		X			X			X	
R (Red)			X			X			X
Piston Diameter	1.25"	1.25"	1.25"	.50"	.50"	.50"	.25"	.25"	.25"
Piston Code	1	1	1	2	2	2	3	3	3





## E-STICK PILOT

- » STAINLESS STEEL CONSTRUCTION
- » SOLENOID VALVE RATED TO 150 PSI
- » DRY OR LIQUID FILLED SWITCH GAGE
- » PRESSURE RANGES UP TO 20,000 PSI
- » OPTIONAL SOLAR PANEL AVAILABLE



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**N70 EXHAUST PORT INDICATOR**



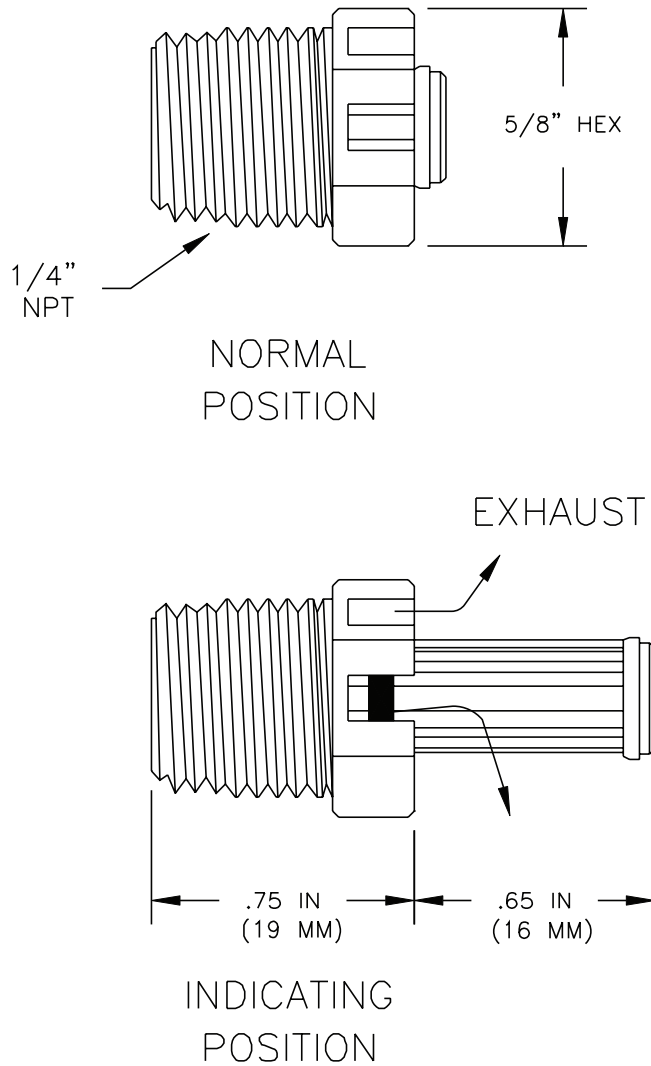
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# MODEL N70 EXHAUST PORT INDICATOR

The K-Dyne Model N70 Exhaust Port Indicator is specifically designed for use on wellhead and production pneumatic safety systems. When no pressure is flowing thru the exhaust port of a valve or sensor, the "RED" indicator stem remains inside the indicator body. The Exhaust Port Indicator operates when the valve or sensor vents pressure. This pressure extends the "RED" indicator stem outward and at the end of its movement allows the exhaust pressure to escape from four slots in the face of the body. The stem stays extended until manually reset and allows all pressure to freely exhaust to the atmosphere. The small size and simplicity of operation makes the Model N70 Exhaust Port Indicator an economical device for providing "First Out" alarm indication.



## FEATURES & BENEFITS

- Constructed of field proven materials that will provide years of trouble free service.
- Will not affect operation of valve or sensor it is installed on.
- Not affected by vibration and will "stay put" after tripping.
- Can be mounted in any position (horizontal, vertically up or down)

## SPECIFICATIONS

Maximum Exhausted Pressure	150 PSI 151 (10.3 BARS)
Minimum Working Pressure	3 PSI (.2 BARS)
Cv Factor	.4
Ambient Temperature	-20 to 180° F (29 to 82° C)

**Ordering Number**

**N70-4M3VAR000**



R11 MANUAL RESET RELAY



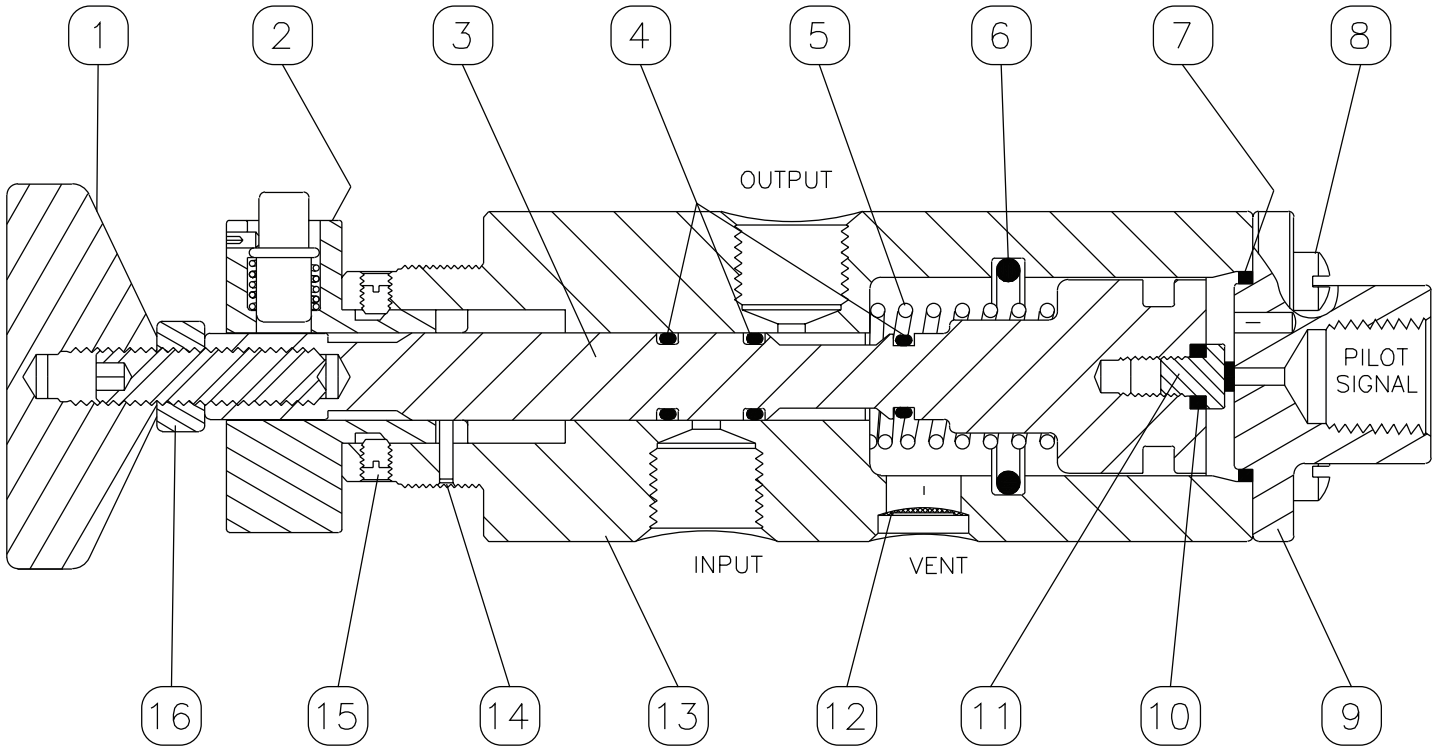
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# MODEL R11 MANUAL RESET RELAY

The K-Dyne Model R11 pneumatic relay is a compact manually operated instrument valve that is well suited for the rigors of inland and offshore production control systems. It operates as a 3-way normally closed, manual reset pneumatic valve with a detent (BYPASS) feature. Its construction makes it ideal for field mounting on actuators, pressure sensors or other control devices.



## Parts List for R11 Manual Relay

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	PART NO.
1	1	Knob	Delrin 507	10-014-000
2	1	Detent Assembly	Delrin 507 (housing), AISI 316 (pin) & AISI 316 (spring)	10-017-000
3	1	Shaft Assembly	AISI 316 St. Stl. & 18-8 Set Screw	11-009-0A0
4	3	Shaft O-Ring	Flouorocarbon	V0-009-75T
5	1	Spring	Inconel X-750	10-010-000
6	1	Body O-Ring	Flouorocarbon	V0-119-75T
7	1	Base O-Ring	Flouorocarbon	V0-019-75H
8	4	Fillister Screw	18-8 St. Stl.	TP-832-0C4
9	2	Base	AISI 316 St. Stl.	11-002-000
10	1	Poppet O-Ring	Flouorocarbon	V0-006-75H
11	1	Poppet Assembly	18-8 St. Stl. & Flouorocarbon	11-004-000
12	1	Screen	AISI 304 St. Stl.	11-010-000
13	1	Body	AISI 316 St. Stl.	11-003-000
14	1	Guide Pin	AISI 302 St. Stl.	R2-002-008
15	2	Set Screw	Nylon	T4-632-045
16	1	Hex Nut	AISI 316 St. Stl.	T6-08K-073
17	---	Repair Kit	Items 4,6,7,10,11,12 & 15	11-005-000

## FEATURES

- Compact size saves space in panel use
- Panel mountable using optional nut
- Integral screen on "VENT" port
- Field proven materials for construction
- Latch closed design prevents pilot signal from opening relay
- Detent pin for temporary "BYPASS"

## SPECIFICATIONS

Supply Pressure	Vacuum to 150 psi (10.3 Bar)
Pilot Signal Pressure	25 psi (1.7 Bar) to open 20 psi (1.3 Bar) to close
Operating Temperature	-20/+180° F -29/+82° C
Cv Factor	.34

Ordering Number **R11-K10M2V000**





**R11 AUTO RESET RELAY**



[www.k-dyne.com](http://www.k-dyne.com)

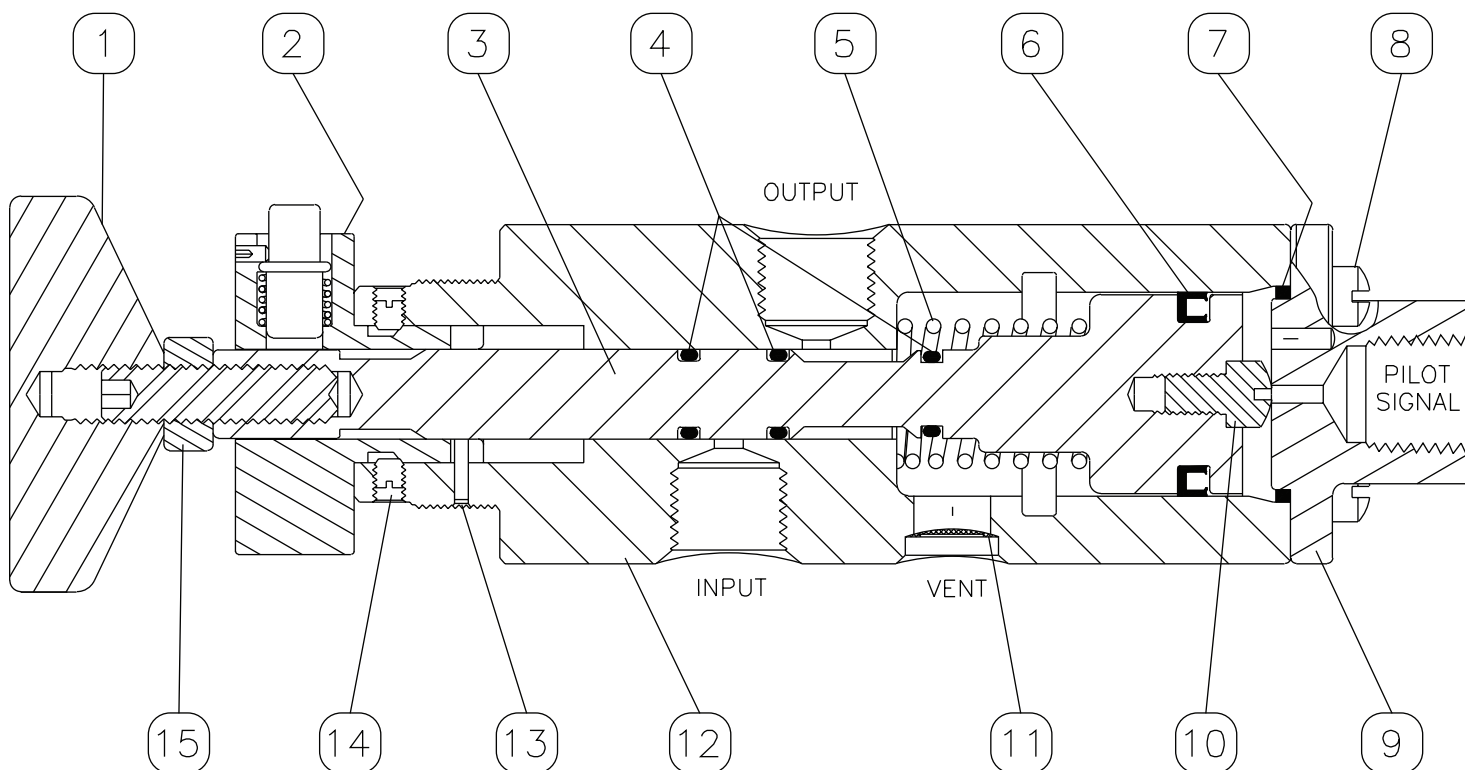
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Tomball, TX 77375  
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F: 281.397.7495





# MODEL R11 AUTO RESET RELAY

The K-Dyne Model R11 pneumatic relay is a compact manually operated instrument valve that is well suited for the rigors of inland and offshore production control systems. It operates as a 3-way normally closed, automatic reset pneumatic valve with a detent (BYPASS) feature. Its construction makes it ideal for field mounting on actuators, pressure sensors or other control devices.



## Parts List for R11 Auto Relay

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	PART NO.
1	1	Knob	Delrin 507	10-014-000
2	1	Detent Assembly	Delrin 507 (housing), AISI 316 (pin) & AISI 316 (spring)	10-017-000
3	1	Shaft Assembly	AISI 316 St. Stl. & 18-8 Set Screw	11-009-0A0
4	3	Shaft O-Ring	Flourocarbon	V0-009-75T
5	1	Spring	Inconel X-750	10-010-000
6	1	Piston Seal	Buna-N	NU-209-75T
7	1	Base O-Ring	Flourocarbon	V0-019-75H
8	4	Fillister Screw	18-8 St. Stl.	TP-832-0C4
9	1	Base	AISI 316 St. Stl.	11-002-000
10	1	End Stop	18-8 St. Stl	
11	1	Screen	AISI 304 St. Stl.	11-010-000
12	1	Body	AISI 316 St. Stl.	11-003-000
13	1	Guide Pin	AISI 302 St. Stl.	R2-002-008
14	2	Set Screw	Nylon	T4-632-045
15	1	Hex Nut	AISI 316 St. Stl.	T6-08K-073
16	---	Repair Kit	Items 4,6,7,10,11 & 14	11-011-000

## FEATURES

- Compact size saves space in panel use
- Panel mountable using optional nut
- Integral screen on "VENT" port
- Field proven materials for construction
- Will automatically open upon application of signal pressure.
- Detent pin for temporary "BYPASS"

## SPECIFICATIONS

Supply Pressure	Vacuum to 150 psi (10.3 Bar)
Pilot Signal Pressure	30 psi (2.0 Bar) to open 10 psi (.7 Bar) to close
Operating Temperature	-20/+180° F -29/+82° C
Cv Factor	.34

Ordering Number **R11-K10A2VN00**



## ESD STATIONS



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**QX1 QUICK EXHAUST VALVE**



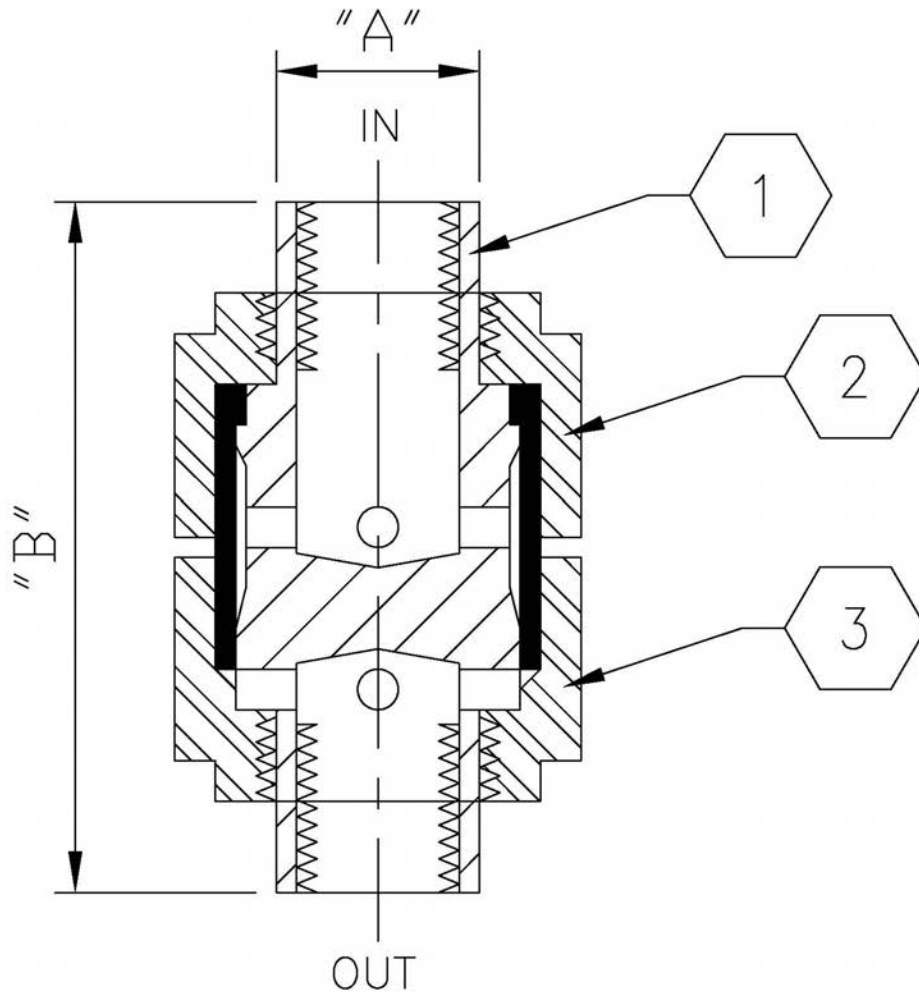
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F: 281.397.7495



# MODEL QX-1 QUICK EXHAUST VALVE

The K-Dyne Model QX-1 quick exhaust is designed to rapidly bleed the control pressure from an actuator or other pneumatic device. It is typically used on safety valves, control valves, or other devices that must respond quickly when the control signals are removed. Its in-line design and three part construction make the quick exhaust easy to install and maintain. No special tools are needed for repair and assembly.



## FEATURES & BENEFITS

- 316 SST Construction
- Durable Viton Seal
- Large Cv factor produces large flow rates
- Small compact design
- No moving parts
- No O-Rings

## Parts List for QX-1 Exhaust

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	PART NO.
1	1	Center Spool	316 SST	10-014-000
2	1	Bladder	Viton	18-019-000
3	2	Body	316 SST	18-017-000

## DIMENSIONS in. (mm)

A	.62" (15.875)
B	2.125" (53.975)
Port Size	1/4" NPT
Weight	12.0 oz (227 gm)

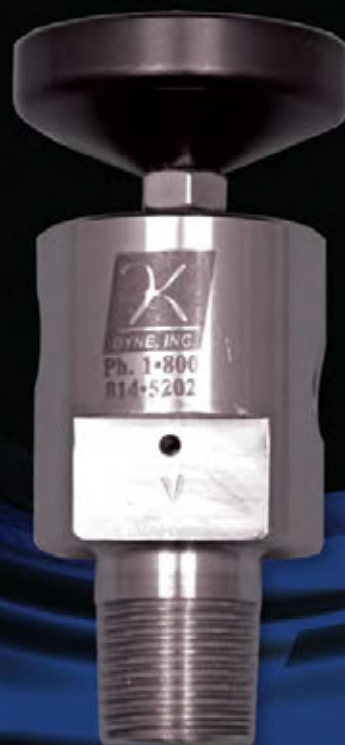
## SPECIFICATIONS PSI (BAR)

Valve Body Max. W.P.	150 (10.3)
Ambient Temperature	-20 to 250° F
Range	-29 to 122° C
Cv Factor Venting	2.75
Cv Factor Input	1.0

**Ordering Number QX-1**



**S16 SAND PROBE RELAY**



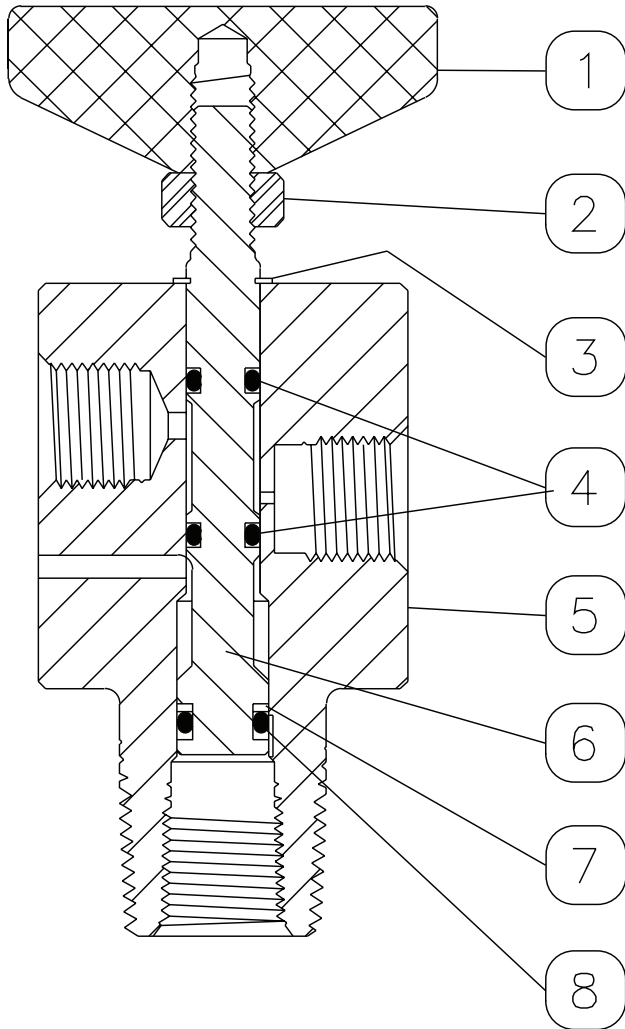
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Tomball, TX 77375  
P: 281.397.7099  
F: 281.397.7495





# MODEL S16 SAND PROBE RELAY

The K-Dyne Model S16 Probe Relay is a 3-way, pilot or manually operated pneumatic/hydraulic instrument valve for use with most types of erosion/corrosion probes. This small compact valve can withstand the most rigorous environments.



## Parts List for S16 Sand Probe

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	PART NO.
1	1	Knob	Delrin 507	10-014-000
2	1	Hex Nut	AISI 316 St. Stl.	T6-08K-073
3	1	Retainer Ring	AISI 302 St. Stl	S6-B10-107
4	2	Spool O-Ring	Fluorocarbon	VQ-008-75T
5	1	Body	AISI 316 St. Stl.	16-003-000
6	1	Spool	AISI 316 St. Stl.	16-002-000
7	1	Back Up O-Ring	PTFE	TB-011-00C
8	1	O-Ring	Fluorocarbon	TP-832-0C4
9	---	Repair Kit	Items 3,4,7 & 8	16-003-000

## FEATURES & BENEFITS

- Constructed of field proven materials that will provide years of trouble free service.
- May be manually operated for testing
- Not affected by vibration
- Can be mounted in any position (horizontal, vertically up or down)
- May be field or panel mounted
- 10,000 psi Probe Sense Pressure
- Meets NACE MR-01-75

## SPECIFICATIONS

Maximum Instrument Pressure	150 PSI (10.3 Bar)
Maximum Probe Sense Pressure	10,000 psi (690 Bar)
Cv Factor	.085
Ambient Temperature Range	-20 to 180° F -29 to 82° C
Process Temperature Range	-20 to 300° F -29 to 149° C
Weight	1 lb. (.45 kg)

**Ordering Number**

**S16-N3BV000000**







## THE PLATINUM LEVEL GAUGE

*Magnetic Liquid Level Gauges and Controls*

Patented Wide-Flag™ Solid Design  
Magnet -350° / 1100° F rating

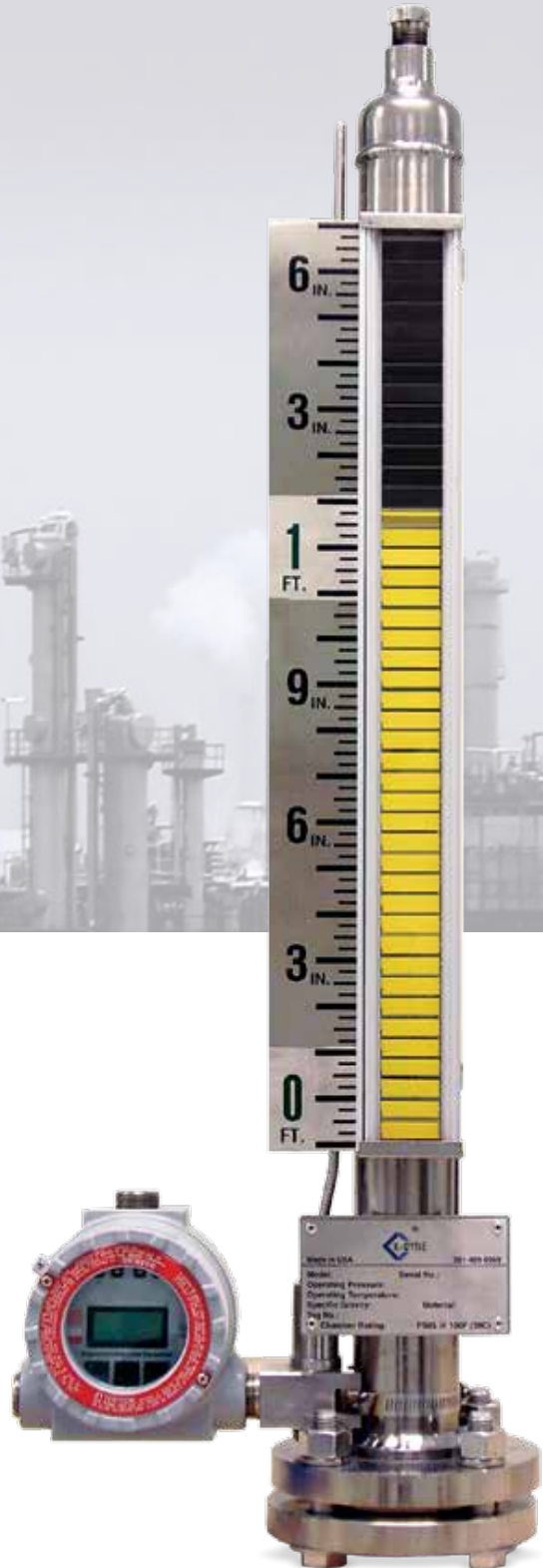
Replaces Sightglasses

Standard 2-4 week delivery  
Expedited delivery available

Constructed to meet ANSI/ASME  
codes B31.1/B31.3 Min. Sch 40

No Pressurized Floats

All Welds are GTAW/TIG  
No MIG or T-Drilling



## K-Dyne

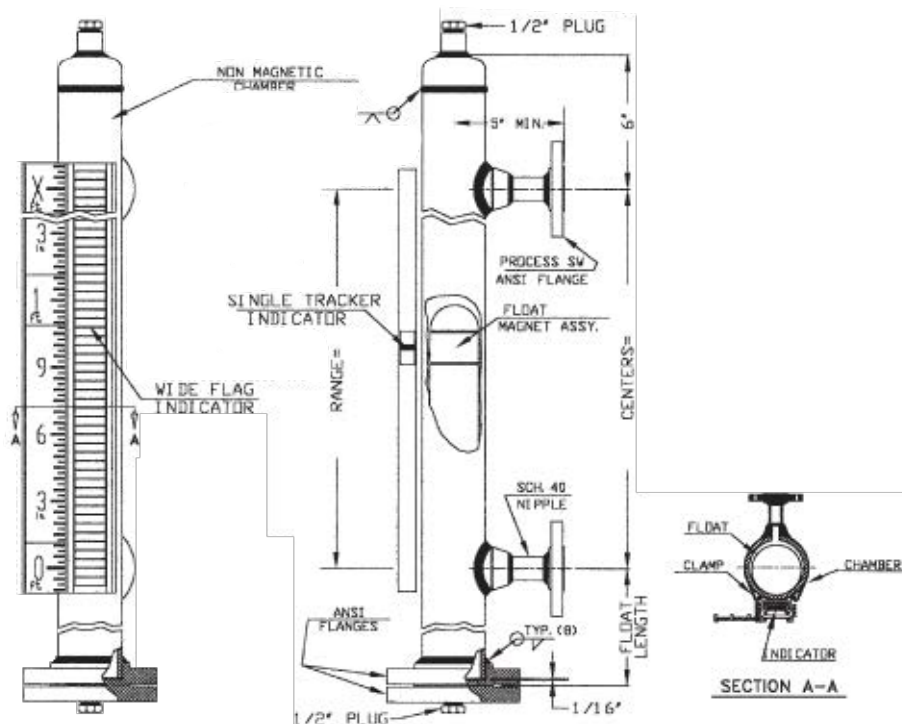
K-Dyne is a proven leader in liquid level measurement technology. K-Dyne's level gauges are the safest and most economical ways to measure and control your level requirements. They can be installed on almost any shape, size or type of vessel in the industry. In applications of extreme pressure, temperature, vibration and highly corrosive or hazardous material, K-Dyne's level gauges will perform where others fail.

### Principles of Operation

The Chamber is constructed of non-magnetic materials, and process connections to mate with those of the tank, vessel or other equipment where the level is to be measured.

The Float is engineered and located inside the Chamber. It is sized and weighed to the specific gravity of the process fluid to be measured. The Float contains a 360° Magnetic Assembly which generates a strong uniform magnetic circuit. The magnetic Flux Lines generated by the Float interlocks with the Indicator. The hermetically sealed Indicator, the Wide Flag™ or Wide Tracker™ Style, contains its own magnetic assemblies which interlock with the float through the Chamber, providing a strong and reliable design.

As the Float moves with the changes in the liquid level, the magnetic attraction between the Indicator and Float will ensure that the Indicator will track the position of the float exactly and the liquid level is measured precisely.



## Indicators



Wide Tracker™



Wide Flag™ (Patented)

### Wide Tracker™

- » Extra Large Rectangular Indicator
- » 1.40" Wide X 1.5 Long
- » Bright Yellow (other colors available)
- » Dual Magnetic Coupling

### Wide Flag™

- » Easy to read 1.40" Wide-Flag (Visible from 200+ft)
- » Patented solid one piece ceramic magnetic flag
- » 180 degree rotation
- » Temperatures from -350°F to 1100°F
- » High contrast Yellow (liquid) & Black (vapor)
- » Other color combinations available

### Available Enclosures:

*Anodized Aluminum or 316 Stainless Steel*

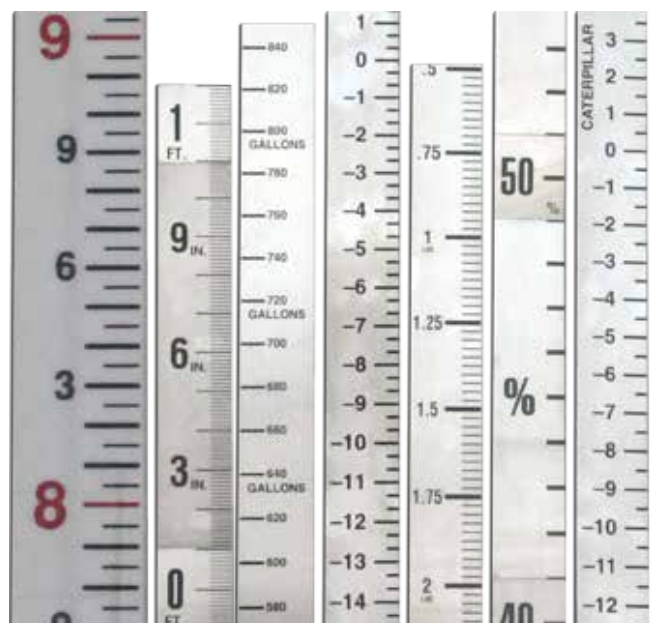


### Scales

- » Scale can be customized to any increments (FT/IN, Gallons, Percent, metric, etc.)
- » All scales are photo etched into Stainless Steel - No rusting, fading or stickers falling off
- » Large, easy to read markings that allow measurement to be taken from a safe distance

### Scale available in:

- » Feet/Inch Standard
- » Metric
- » % Scale
- » th<sup>s</sup> Scale
- » Wide Acrylic Scale
- » Gallon Scale
- » +/- Scale
- » Inch only Scale



## Point Level Switches



### MGS-200EX & MGS-200EX/2

Type	Electrical
Volts	150 VAC / VDC
Current	1.0 AMPS
Power	25 Watts
Contacts	SPDT or DPDT
Deadband	½ inch
MAWT	-40°F to +800°F
Enclosure	NEMA 4X
Connection	¾" FNPT

### MGS-700EX & MGS-700EX/2

Type	Electrical
Volts	125/250 VAC
Current	10.0 Amps
Power	2500 Watts
Contacts	SPDT or DPDT
Deadband	½ inch
MAWT	-40°F to +600°F
Enclosure	NEMA 4X
Connection	¾" FNPT



### MGS-500EX & MGS-500EX/2

Type	Electrical
Volts	500 VAC/VDC
Current	3.0 AMPS
Power	100 Watts
Contacts	SPDT or DPDT
Deadband	½ inch
MAWT	-40°F to +600°F
Enclosure	NEMA 4X
Connection	¾" FNPT

### MGS-700EX & MGS-700EX/2

Type	Electrical
Volts	125/250 VAC
Current	15.0 Amps
Power	3750 Watts
Contacts	SPDT or DPDT
Deadband	½ inch
MAWT	-40°F to +600°F
Enclosure	NEMA 4X
Connection	¾" FNPT



*Stainless Steel Enclosures Available For All Switches*

## ELECTRICAL AREA CLASSIFICATION: CLASS I, DIVISION I, GROUPS B, C, D



### MGS-100: Non-bleed Pneumatic Switch

Type	Non-Bleed Pneumatic
Supply Pressure	30 – 200 PSIG
Deadband	½ inch
MAWT	0°F to 200°F
Enclosure	316 SS
Connection	¼" FNPT



## Floats

- » All floats are engineered to the specific operating conditions of each application
- » Shell is constructed of stainless steel, titanium, hasteloy, monel, CPVC, PVDF (Kynar), or any other non-magnetic material
- » Magnetic circuit is made of a series of Alnico magnets to provide a light yet effective connection
- » We can handle the highest pressures in the industry with NO oversized, pressurized or vented floats. Pressurized floats can be a safety concern and can leak over time
- » K-Dyne uses solid engineering to conquer the demands of high pressures and low gravities.



*CPVC Float*



*Kynar Float*



*Titanium High Pressure Float*



*High Pressure Interface Float  
with Field Adjustable Weight*



*Coated Float for Corrosive Process*



*Standard Stainless Steel Float*



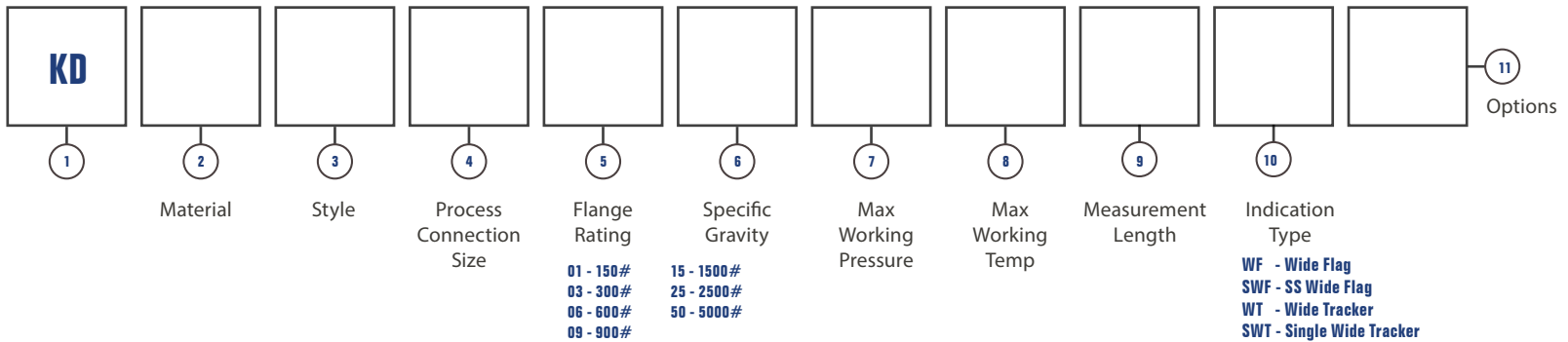
*The Carbon Fiber Float® (Patent Pending)*

## A Superior Magnetic Circuit

When designing the magnetic circuit between the float and indicator there are many considerations other than just how strong the magnets are in the float. K-Dyne level gauges have undergone extensive testing to produce a rigid and high performance design with an unique construction the indication performs under the most demanding conditions — high/low temperatures, vibrations, schedule 160 chambers, and more. Our patented solid magnet Wide Flag™ design not only provides highly visible indication, but provides a powerful connection with the float. The reliability and repeatability of the K-Dyne float and indicator combination is unmatched.



## HOW TO ORDER



## To construct a K-Dyne Liquid Level Gauge

### Standard Specifications

- » Non-Magnetic Chamber Material
- » All Flanges, Fittings & Pipe Meet ASME/ANSI Standards
- » Fabricated/Welded to B31.1/B31.3 Code

### Float Chamber

- » 2"-3" pipe W/RF Flanges - Sch 40
- » ½" FNPT vent & drain connections
- » All flanges & fittings rated for process conditions
- » Connections: 1/2" thru 8" plus
- » Pressure ratings up to 5000 PSIG
- » Temperature Rating: -350°F to +1100°F
- » Specific gravity range: .28 and up
- » Lengths from 4.0" to 50 feet

### Scale

- » Feet & Inches, ¼" divisions
- » Photo etched and backfilled on stainless steel
- » Metric, Percentage or Volumetric Available
- » Optional 3½" Acrylic scales

### Indicator

- » Bright colored
- » Can be seen from 200 ft or more
- » 1.4" wide
- » Hermetically Sealed

### Material

- » 4S - 304/304L SS
- » 4C - 304 SS / CS
- » 6S - 316/316L SS
- » 6C - 316 SS / CS
- » 2S - 321 SS
- » 4T - Non-Stick Coating
- » 4H - Halar Coated 304 SS
- » NS - Non-Stick Coating
- » AL - Aluminum
- » A2 - Alloy 20
- » MO - Monel
- » TT - Titanium
- » HB - Hastelloy B
- » HC - Hastelloy C
- » ZR - Hastelloy C
- » CP - CPVC
- » PV - PVC
- » KY - Kynar (PVDF)
- » PP - Polypropylene
- » CM - Other material

### OPTIONS

#### Chambers

- » WN - Weld Neck Flanges
- » LJ - Lap Joint Flanges
- » RJ - Ring Joint Flanges
- » BW - All Butt Weld Construction
- » NM - NACE MR0175/MRO103

#### Temperature Control

- CI - Low Temp. Cryogenic Insulation
- IB - High Temp. Insulation Blanket
- EH - Electrical Heat Tracing
- FP - Freeze Protection
- ST - Steam Tracing
- FE - Frost Extension

#### Testing

- HY - Hydrostatic
- NDE - 100% Non-destructive Testing (Die Penetration, X-Ray)
- PMI - Positive Material Identification

### Indicator & Scale

- WF - Wide Flag™
- WT - Wide Tracker™
- MS - Metric Scale
- PS - Percent Scale
- VS - Volumetric Scale
- AS - 3 ½" Acrylic Scale
- FE - Non Frost Extension
- DI - Dual Indication
- IF - Interface Indication
- AR - Level Arrow Indicators
- IG - Indicator Guard
- HDC - Heavy Duty Mounting Clamps

### Valves

- GV - Gate Valves
- VD - Vent & Drain Valves

**Example: P/N MG - 6C - A-1.0" - 15 - .40 - 1200 - 500°F - 38.0" - WF-WN-HB**

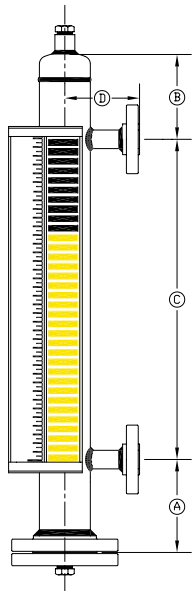
#### Description

- 1 K-Dyne
- 2 Chamber Material: 316SS with Carbon Steel Flanges and Fittings
- 3 Style: A
- 4 Process Connection: 1.0" Raised Face Flange
- 5 Flange Rating: 1500#
- 6 Specific Gravity: .40
- 7 Max Working Pressure: 1200psig.
- 8 Max Working Temperature: 500°Fb
- 9 Process Connection C/L: 38.0" Measurement Length: 38.0
- 10 Wide Flag Indication
- 11 Option: Weld Neck Flanges Insulation Blanket

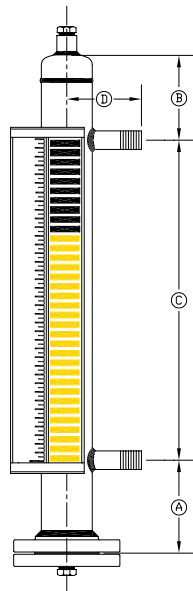




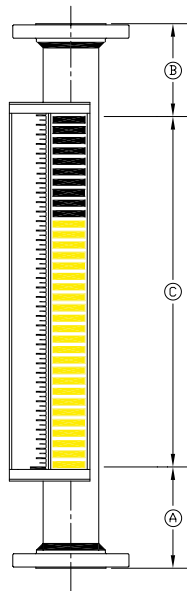
# Chamber Styles



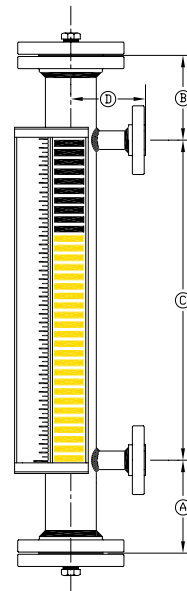
Style A



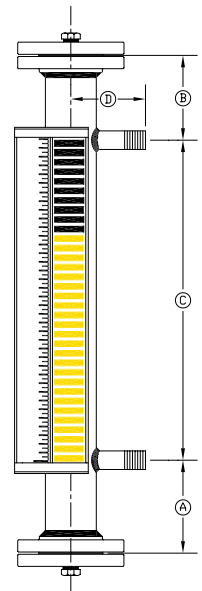
Style B



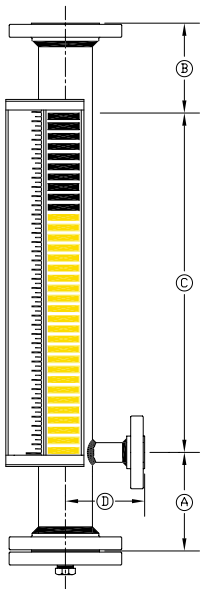
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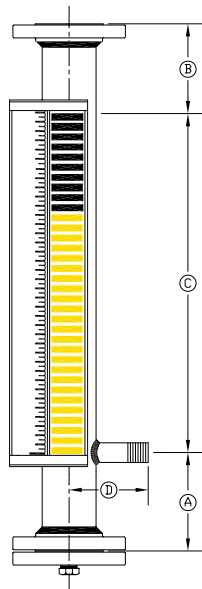
Style D



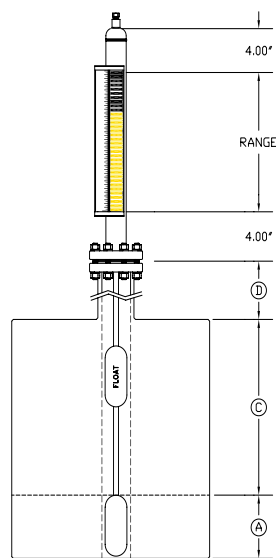
Style E



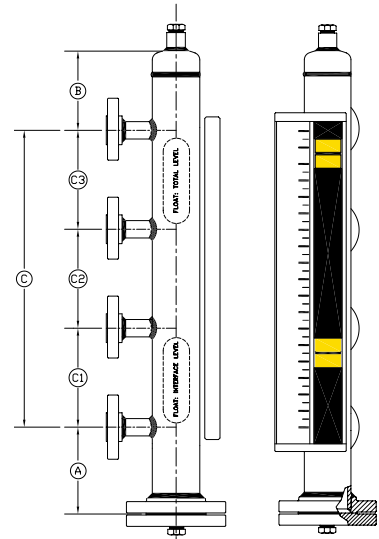
Style F



Style G



Style H



Style X  
(Other configurations)

\*Typical dimensions A = 12.0" B = 6.0" D = 6.0" C = Specify \*Dimensions may vary with process conditions/applications.



## Transmitters - Non Invasive

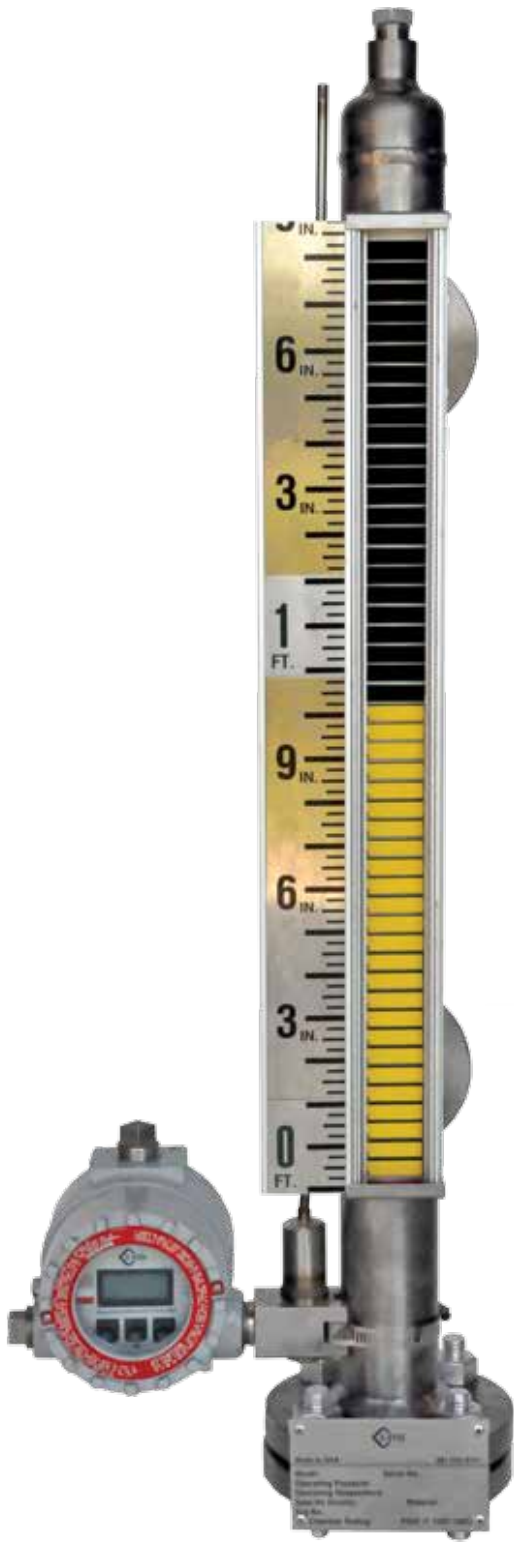
### Magnetostrictive Level Transmitter - MGT-2523

K-Dyne's MGT-2523 series level transmitter is the latest development in magnetostrictive level sensing technology that is designed exclusively for magnetic level gauges. The MGT-2523 contains a low profile waveguide that is mounted away from the level gauge chamber. This durable slim design isolates the dual sealed waveguide from excessive vibration and temperature. From enhanced sensor technology, the output signal is fast, stable and extremely accurate.

### Standard Features

- » Two wire, loop powered, 24 VDC nominal
- » 4-20 mA, inches/metric and/or percent output signal
- » Scrolling LCD digital display in 4-20 mA, in/cm or percent
- » Local and remote detection for total or interface level elevations
- » HART protocol field communication
- » Local programmability allows for quick & easy setup
- » No recalibration necessary, set it and forget it
- » Non wetted, dual sealed low profile waveguide design, 316 SS
- » Isolated from excessive thermal & vibration effects
- » Top, bottom or remote transmitter head mountings
- » Accurate to within 0.01% of total span selected
- » Durable design with a strong, noise free signal output
- » State of the art sensor and transmitter electronics
- » Unique transmitter puck design
- » Simple retrofit to most magnetic level gauge chambers
- » Explosion proof housing, NEMA Type 4X
- » Class I, Division 1, Groups B, C, D
- » Class II, Division 1, Groups E, F, G
- » Class III





## Typical Customizations



*Sanitary K-Dyne gauge  
(Tri-colored flags)*



*Drum Level Indicator*

*Meets ASME Boiler Code  
(PG60) for water level  
indicators on Boiler Drum*

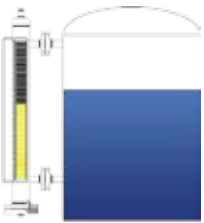


*High Temperature Insulation  
shown with Red/White WF  
Indicator option*

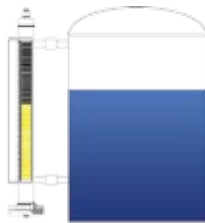


*Cryogenic Insulation  
with MGT-2523*

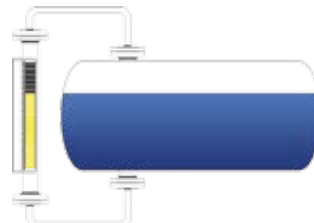
## Typical Installations



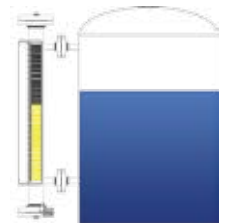
*Style A*



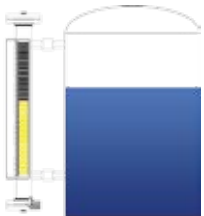
*Style B*



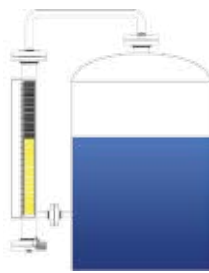
*Style C*



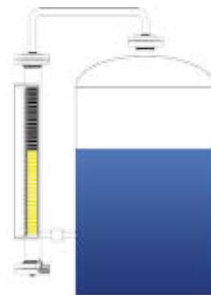
*Style D*



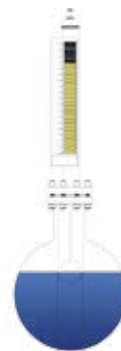
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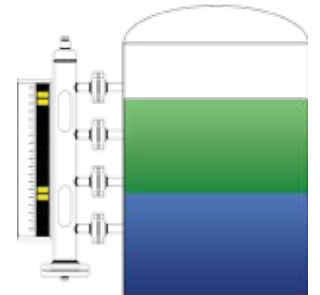
*Style F*



*Style G*



*Style H*



*Style X*



## Applications

- » Acetic Acid
- » Ammonia
- » Asphalt Settler
- » Benzene
- » Blow case
- » Boiler Steam Drum
- » Butane
- » Caustics
- » Cooling Towers
- » Deionized Water
- » Dow Therm
- » Drip Pot
- » Feedwater Heaters
- » Flare Drums
- » Freon
- » Glycol
- » Hydraulic Oil
- » Hydrazine
- » Hydrochloric Acid
- » Hydrofluoric Acid
- » Hydrogen Sulfide
- » Interface (ie: oil/water)
- » Jet Fuel
- » LPG
- » Liquid Carbon Dioxide
- » Liquid Ethylene
- » Molten Sulfur
- » Phosgene
- » Propylene
- » Propane
- » Seal Oil Pots
- » Slop Oil
- » Sour Oil
- » Sump Tank
- » Underground Storage

## Other Products



*L80 Electric Switches*



*L80 Pneumatic*



*L80 Electric Vertical*



*P40 Pressure Switch*



*R11 Manual Reset Relay*

