KENCO ENGINEERING COMPANY

P.O. BOX 470426 TULSA, OK 74147-0426
PHONE(918) 663-4406 FAX: (918) 663-4480
www.kenco-eng.com e-mail:info@kenco-eng.com

INSTALLATION INSTRUCTIONS FOR MODEL LCE, LCE-3318, LCE-3358, LCE-HL, AND LCE-DPDT OIL LEVEL SWITCHES WITH ADAPTERS (INCLUDING HIGH PRESSURE MODELS)

Note: For fire safe oil level controllers (LCE-FS) see additional instructions in this work sheet covering installation of fire safe valves.

ELECTRICAL RATINGS:

15 AMP, 125/250/480 VAC
0.5 AMP, 125 VDC
0.25 AMP, 250 VDC
1/8 HP, 125 VDC
¼ HP, 250 VAC

I. SWITCH ADJUSTMENTS FOR LOW LEVEL SWITCH CONFIGURATIONS: SEE FIGURE 1

- Remove the condulet lid
- Loosen nuts A and B
- Turn screw C clockwise to lower the trip point
- Turn screw counterclockwise to raise the trip point
- After adjustment is complete, tighten nuts A and B and re-attach the lid

Figure 1

Single Pole Double Throw	3318-High/Low Single Pole Double Throw	3358-Low/Low Single Pole Double Throw	Double Pole Double Throw

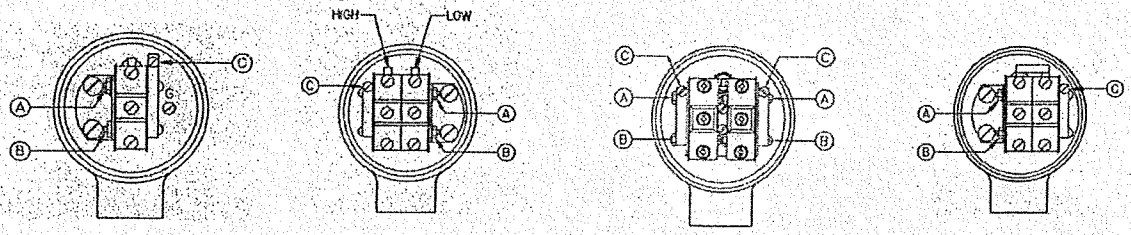
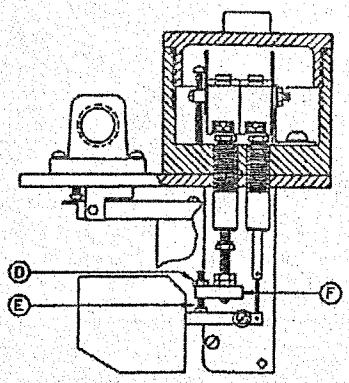


Figure 2

LCE-3318 HIGH LEVEL SWITCH ADJUSTMENT: SEE FIGURE 2

NOTE: To adjust the high level trip point on the LCE-3318, the cover plate and the Float must be removed from the controller. This may require connections from the oil supply tank and electrical conduit to be disconnected temporarily.

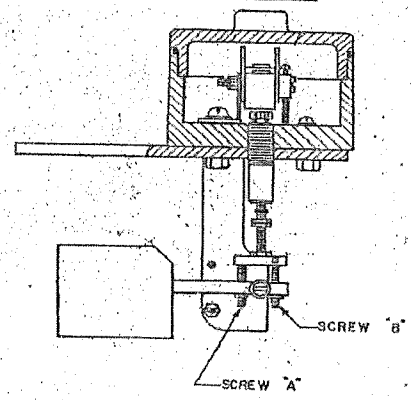
- Adjust oil level to the desired "HIGH" level.
- Remove the 4 cover plate bolts and raise the cover plate to expose the float and switch actuating mechanism.
- Loosen lock nut on push rod at location D.
- To raise the high level trip point, thread adjustment screw E into the actuator F.
- To lower the high level trip point, thread adjustment screw E out of the actuator F.
- After high level trip point is adjusted, tighten lock nut D on the adjustment screw E against the actuator F. Replace cover and check operation of unit.



LCE-HL HIGH LEVEL OR LOW LEVEL SWITCH ADJUSTMENT INSTRUCTIONS:

- Remove the (4) bolts on the cover plate and remove the cover plate assembly from the controller
- For low level, loosen the nut on screw "B"
- Turn screw "B" clockwise to lower the trip point or counterclockwise to raise the trip point
- Tighten the nut on screw "B" to set the trip point
- For high level, loosen the nut on screw "A"
- Turn screw "A" clockwise to raise the trip point or counterclockwise to lower the trip point
- Tighten the nut on screw "A" to set the trip point

Figure 3



II. INSTALLATION AND MAINTENANCE INSRTUCTIONS FOR OIL INLET VALVE:

- Connect the oil supply line to the oil inlet on the oil level controller. The minimum recommended supply line is ¾" I.D. The supply line must be clean and it is recommended that it be flushed with solvent before installation.
- Connect the oil supply line to the oil supply tank. If there is no existing valve at the tank or the existing supply outlet, a shut-off valve should be placed in the line to prevent oil loss when cleaning the inlet screen or filter.
- For high pressure models HP-A, pressure range must be between 5 psi and 34 psi. For high pressure models HP-B, the pressure range must be between 35 psi and 70 psi.
- The oil inlet valve is adjusted to maintain the oil level at the center of the sight glass. Low or high levels are often caused by two problems:
  1. Excessive oil inlet pressure, which will cause the unit to overfill.
  2. Improper equalizing lines between the crankcase and the controller will also result in improper levels.

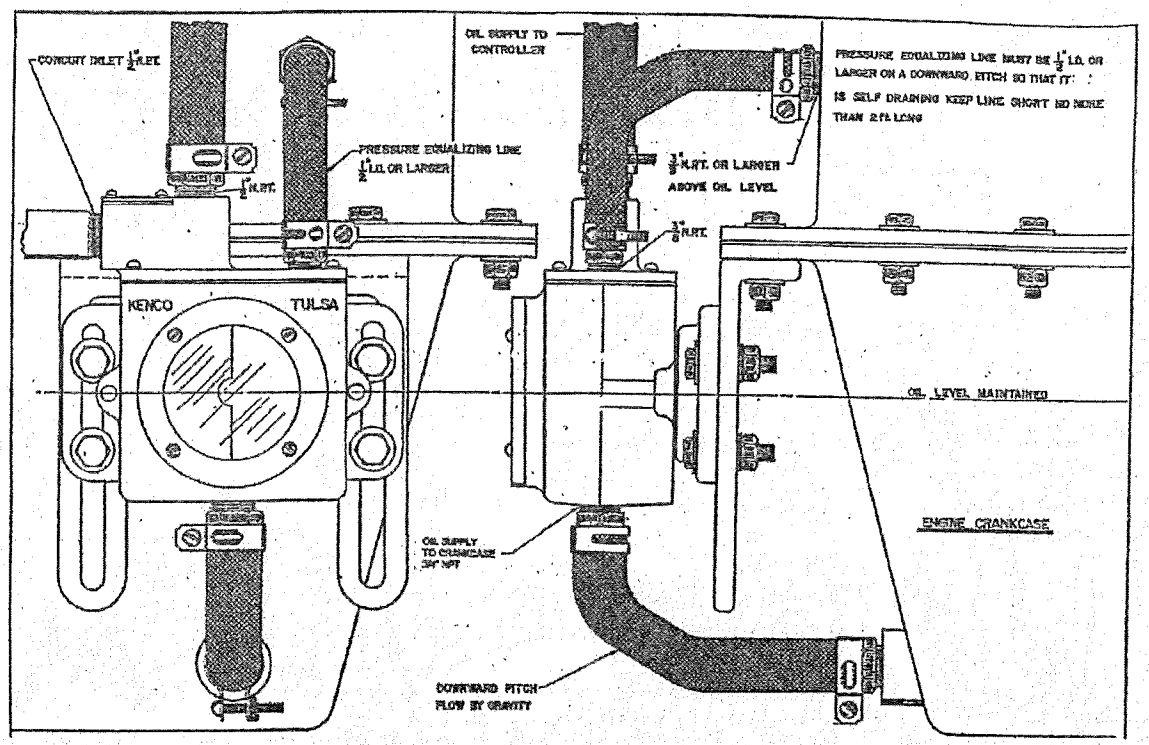
Note: Low pressure models require a minimum of 2' of head pressure and a maximum of 15' of oil inlet head pressure.

III. INSTALLATION INSTRUCTIONS FOR UNITS WITH ADAPTERS:

OIL LEVEL CONTROLLERS WITH –9 (Universal adapter), -10 (Slotted universal adapter), -12 (Pole mounted adapter) AND –FS OPTIONS

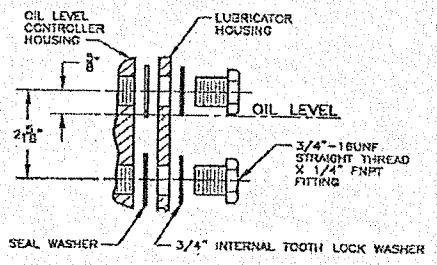
- Set the controller so that the centerline of the sight window corresponds to the desired oil level in the crankcase.
- Mount the controller close to the crankcase and connect the hose from the ¾" outlet located on the controller to the crankcase. NOTE: The outlet port on the oil level controller must be located below the oil level in the crankcase.
- An equalizing line must be used between the controller and crankcase in order to equalize the pressure. The tubing must be a minimum of 1/2" I.D. and must be kept under 2 feet. DO NOT loop this line. It must be trap free and self draining, with a downward pitch flow by gravity.

Figure 4: Typical Mount of –9 Adapter (Shown with Kenco 512 Oil Controller)



OIL LEVEL CONTROLLER WITH –11 AND –11-FS OPTION (for Mechanical Lubricators): See Figure 5

Figure 5



- **Drill holes in the lubricator housing as shown, and mount the controller with the inlet located on the top side using the seal washers and mounting bolts provided.**
- **Place the seal washers between the controller and the lubricator housing.**

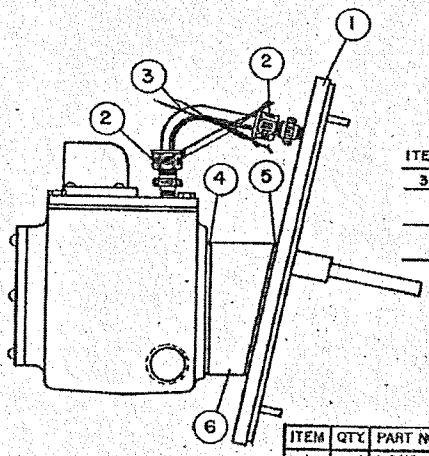
OIL LEVEL CONTROLLER WITH –14 AND –14 –FS OPTION (White Compressor)

- **Remove the triangular blind flange located on the compressor and mount the controller assembly in its place.**

OIL LEVEL CONTROLLER WITH –17 (Waukesha VHP Engines F2895, F3251, F5108, L5790 & L7042), -18 (-17 w/ meter), -27 (for newer Waukesha engines same as –17), –37 (Waukesha P9390), -38 (same as –37 w/ meter) AND –FS OPTIONS

- **Remove the cast aluminum inspection door from the engine. Remove the clamp bar from the old door.**
- **For –17, -18, -37, -38 install the o-ring into the groove of the Kenco door and replace the clamp bar on the back side of the door using the 5/8" bolts and the stat-o-seals supplied by Kenco.**
- **For –27, install the o-ring into the groove of the Kenco door and replace the clamp bar on the back side of the door using the 7/16" bolts and the stat-o-seals supplied by Kenco.**
- **Install the equalizing line between the controller cover plate and the door (Tubing and connectors supplied by Kenco).**
- **Place the controller assembly into the inspection port of the engine and tighten the center bolt(s) down.**
- **Install oil inlet line into the controller oil valve or the meter inlet port.**
- **NOTE: For the –18 model, refer to the additional instructions supplied with the 1618 Kenco Low Flow meter.**

Figure 6: -Door Assembly for –17, -18, -27, -37, -38



NOTE: PACKAGE ITEM'S

ITEM	QTY	PART NO.	DESCRIPTION
3	1	A-4413	3/8"O.D. TUBE X 4-1/2"LG.
	1	A-4406	MOUNTING BOLT FOR DOOR
	1	A-4407	STAT-O-SEAL
	1	A-7004	INSPECTION DOOR GASKET

ITEM	QTY	PART NO.	DESCRIPTION
1	1	C-1419	17 ADAPTER
2	2	A-5620	3/8" TUBE O.D. X 3/8"N.P.T. MALE CONN.
3	1	A-4413	3/8"O.D. TUBE X 4-1/2"LG. S.S.
4	1	A-2631	GASKET
5	1	A-2443	GASKET
6	1	B-1763	SUB ADAPTER

OIL LEVEL CONTROLLER WITH -24 (Ariel Compressor JGB, JGE, JGH, JGK, JGR, JGT, JGV, & JGW) and -48 (Ariel compressor JGC & JGD) AND –FS OPTIONS

- **Remove the sight glass located on the crankcase and replace it with the oil controller assembly using the mounting bolts and gasket supplied with the unit.**

OIL LEVEL CONTROLLERS WITH –1 (Clark MA & CFA) –2 (Clark HMB & TMB), -3 (Clark RA, HRA, HBA, HCA, HLA, TLA), -6 (Cooper-Bessemer GMW), -7 (Cooper-Bessemer GMV), -8 (Cooper-Bessemer GMX), -16 , -16-R, -16-6.25 (Cooper-Bessemer BMV & 275) AND FS OPTION

- **Remove the visual oil gauge assembly from the engine and replace it with the oil level controller and adapter assembly supplied with a gasket and mounting bolts when applicable.**

OIL LEVEL CONTROLLERS WITH –4 (Ingersoll-Rand SVG & KVS), -5 (Ingersoll-Rand KVG) AND FS OPTIONS

- Remove the visual oil gauge assembly from the engine and replace it with the oil level controller and adapter assembly supplied with a gasket and mounting bolts when applicable.
- If an equalizing exists for the engine sight glass and detach the equalizing line from the sight glass while still attached to the engine.
- Install the oil controller and then reattach the equalizing line to the vent located at the top of the adapter.

Note: It is important to insure that there are no loops in this line for it must be trap free and self draining.

IV. INSTALLATION INSTRUCTIONS FOR FIRE SAFE VALVES: See Figure 7

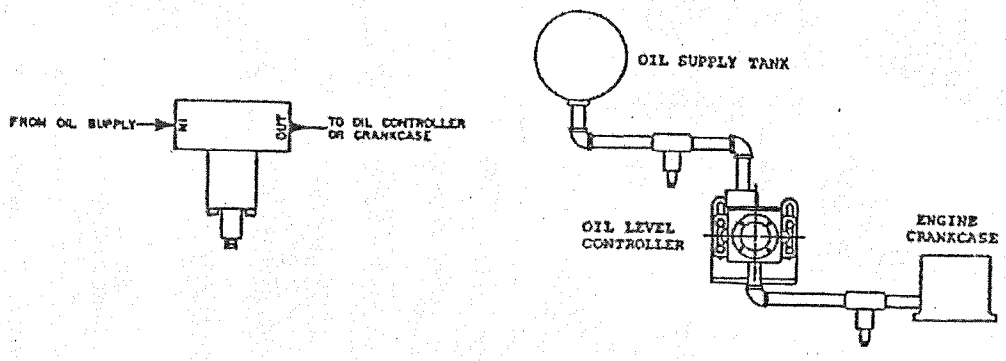
MODEL 50-FS AND 75-FS (PATENT NO. 3,877,476)

NOTE: All lines between thermal valves, supply tanks and the controller must be made of steel. DO NOT use rubber hose. The lines should be 3/4" I.D.

- The eutectic fuse element should always be in a downward position to help the element melt when heat is applied to the valve.
- The 50-FS valve should be installed in the oil supply line as close to the controller as possible. Meters, filters and pressure regulators should be installed between the controller and the 50-FS.
- The 75-FS valve should be located as close to the crankcase as possible and the oil outlet line should be a minimum ¾" I.D. to insure adequate oil flow to the crankcase.

NOTE: The 75-FS valve is not required when using –FS adapters other than –9 and –12.

FIGURE 7: FIRE SAFE VALVE INSTALLATION



V. START-UP PROCEDURES

- Flush the supply system and the supply line with solvent t remove all burrs and construction debris.
- Insure that the oil supply tank is full.
- After the engine has been running for 1 hour, visually check the oil level in the sight glass. The oil level should be in the center of the sight glass.
- With the engine running, check the crankcase oil level. It should be the same as the oil level in the oil controller. If not, check the installation of the equalizing line (if applicable) see instruction for the equalizing line at –9.
- Check all piping connections for leaks and repair as needed.

VI .SIX MONTH SUGGESTED MAINTENANCE PLAN

Oil Valve Service

- Close the oil supply valve and disconnect the oil supply line.
- Place a pan under the controller to catch the oil from the oil supply line.
- Remove the inlet oil housing and clean the screen.
- Once the screen is clean, reassemble and open the oil supply valve.
- Check all piping connections for leaks and repair as needed.

Switch Service

- Test switches to insure that the switches are operating correctly.
- Shut the engine off.
- Disconnect the equalizing line (if applicable).
- Place a blunt rod through the vent hole on the cover plate and depress the oil float.
- Observe the engine panel to determine if the switches make and break contact.
- If the switch is functioning properly, replace the equalizing line or vent plug.
- If the switch does not function, it must be replaced (refer to a replacement parts list).

Installation Instructions for L150, EL150K1, and EL150 EX Level SWICHGAGE®s for Engine Liquids

L-7758N
Revised 06-00
Section 15
(80 02 0171)

murphy

Please read the following instructions before installing. A visual inspection for damage during shipping is recommended before mounting. It is your responsibility to have a qualified person install the unit.

GENERAL INFORMATION

WARNING

BEFORE BEGINNING INSTALLATION OF THIS MURPHY PRODUCT

- ✓ Disconnect all electrical power to the machine.
- ✓ Make sure the machine cannot operate during installation.
- ✓ Follow all safety warnings of the machine manufacturer.
- ✓ Read and follow all installation instructions.

CAUTION: *Certain danger to human and to equipment such as applied in a mobile or marine application may occur if some equipment is stopped without pre-warning. It is therefore, recommended that monitored functions be limited to alarm only or to alarm before shutdown in such applications.*

Description

The L150, EL150K1 and EL150EX Level SWICHGAGE® instruments are a combination liquid level gauge and low limit switch. Each unit includes a float chamber, an indicating pointer, a dial, and a low level contact. When properly installed and maintained, the float operates the pointer which, in turn, both indicates level during normal operation, and closes a switching circuit if the level falls to the low-limit set point.

Applications

The primary use of these level SWICHGAGE® instruments is for engine cooling systems, surge or expansion tanks, condenser radiator or vapor phase systems, whether pressurized or atmospheric. These instruments can also be used to monitor lube oil, hydraulic fluid or diesel fuel reservoirs and activate alarms and/or shutdown at a predetermined minimum level. These instruments are built for low pressure systems.

Cold Weather Warning

BEFORE FREEZING WEATHER COMES, CHECK TO BE SURE YOUR L150 OR EL150 SERIES COOLANT LEVEL SWICHGAGE® IS FILLED WITH ANTIFREEZE SOLUTION THE SAME AS YOUR ENGINE BLOCK AND RADIATOR. On many engines, such as condenser radiator systems, the coolant in your level SWICHGAGE® remains static until the level falls to drain point. When 'winterizing' it's a good idea to make certain all water drains from your level SWICHGAGE®, to check against clogged connections, and then BE SURE IT REFILLS WITH ANTIFREEZE. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN EQUIPMENT DAMAGE.

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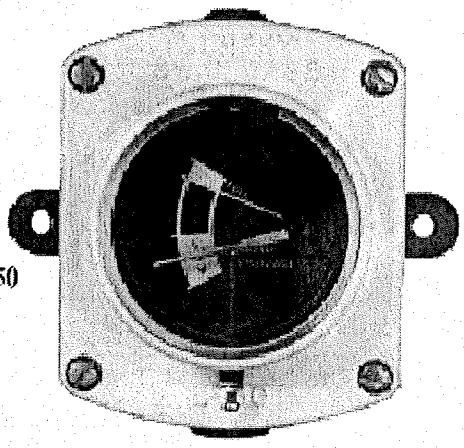


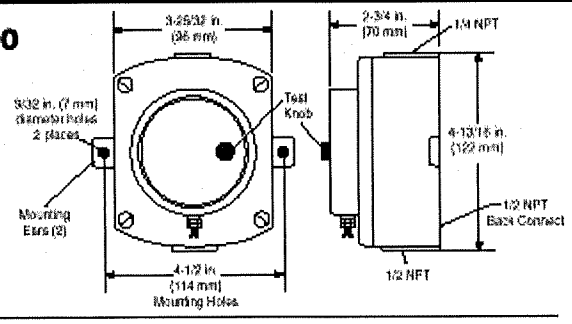
L150

Specifications	L150	EL150K1	EL150EX
Case			
• Die cast aluminum, polyurethane coated	•	•	
• Sand cast aluminum, painted.			•
Float			
• Brass	•	•	
• Stainless Steel (AISI 304)			•
Lens			
• Polycarbonate	•	•	
• Tempered glass			•
O-Rings: Saturated Nitrile, suitable for coolant or hydrocarbons. Maximum temperature 250°F (120°C)	•	•	•
Cover Gasket			
• Neo-cork	•	•	
• Buna			•
Contact Rating			
• Pilot duty 2 A @ 30 VAC/DC resistive SPST	•		
• SPDT rated 10 A @ 125 VAC; 0.5 A @ 125 VDC; 10 A @ 30 VDC		•	•
Vent Tube: 1/4 x 5 in. (6 x 127 mm) with fittings.	•	•	•
Maximum Working Pressure: 25 psi (172 kPa) [1.72 bar]	•	•	•
Electrical Connection			
• (1) 16 AWG x 24 in. (1.5 mm² x 610 mm) with terminals.	•		
• (3) 18 AWG x 14 in. (1.0 mm² x 356 mm)		•	
• Terminal Block			•
CSA Listed for Hazardous Location: Class I, Division 1, Groups C & D.			•

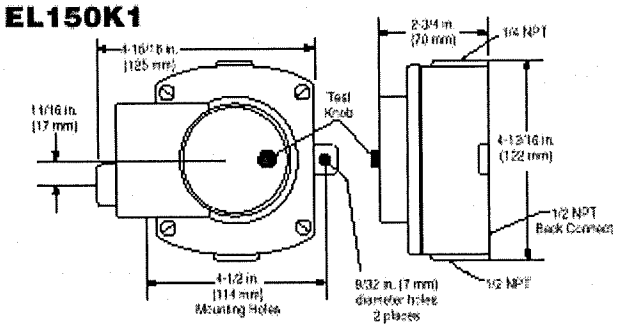
**Products covered by this literature comply with EMC Council directive 89/336/EEC regarding electromagnetic compatibility except as noted.

DIMENSIONS

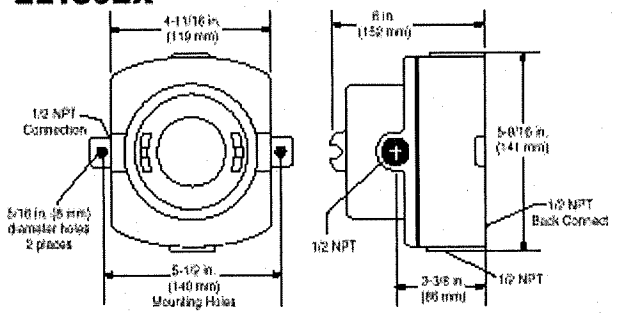
L150



EL150K1



EL150EX



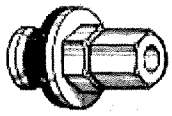
PS FITTINGS INSTALLATION

A Murphy PS fitting is used when there is no threaded fitting in the top tank of the radiator to attach tubing for the L150/EL150 series level SWICHGAGE®.

- **P/N 15-00-0107 (PS)** Accepts 1/4 in. (6 mm) O.D. copper tubing.
- **P/N 15-01-0167 (PS Barbed)** Barbed fitting accepts 1/4 in. (6 mm) I.D. flexible tubing and hose clamp.
- **P/N 15-01-0202 (PS-D)** Accepts 1/2 in. (13 mm) I.D. hose; 1/4 in. (6 mm) copper tube.

1. Determine the entry point into the radiator top tank. See ***Level SWICHGAGE® Installation*** for proper location. Drill 5/8 in. (16 mm) diameter hole in top tank of radiator. Be sure chips do not fall inside the tank. Remove any burrs on the hole wall.
2. Insert the rubber grommet of the PS Blind Hole Fitting. Tighten the jam nut while holding the fitting from turning in the hole. The jam nut will pull the tapered grommet into the hole from the inside of the top tank causing the grommet to expand and seal the hole.
3. Attach the appropriate tubing or hose for the PS Fitting.

15-00-0107



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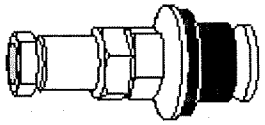

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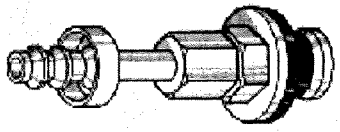


LEVEL SWICHGAGE® INSTALLATION

WARNING: Perform all installations with the power source "OFF". Be sure engine and radiator have cooled and coolant pressure has been relieved. SEVERE BURNS can result. Never remove radiator cap on a hot engine.

IMPORTANT: Operation of the L150/EL150K1 is different for a pressurized cooling system than for an atmospheric (non-pressurized) system. Installation of the L150/EL150K1 is only slightly different for each system. Connection of the top tube connection is the major difference. Differences will be noted in the installation instructions.

Installation Notes

1. All top radiator connections must be away from the return hose turbulence.
2. All bottom radiator connections must be away from the suction hose.
3. The L150/EL150K1 must be attached to a mounting plate on the radiator or other framework.

CAUTION: If the L150/EL150K1 is NOT attached to the radiator, use high temperature quality flexible hose for the top and bottom connections to maintain the shock mounting protection for the radiator.

Pressurized and Atmospheric Systems

1. Drain the cooling system.
2. **For a PRESSURIZED COOLING SYSTEM** (Figure 1) the shutdown point is determined by the entry point A of the tube connection into the top tank. The engine will shutdown when coolant level drops below this connection (see step 4).
   If the radiator has a SHALLOW UPPER TANK, you can make entry from the top as illustrated in Figure 2. Insert the copper tube until it is slightly above the core. Secure the fitting.

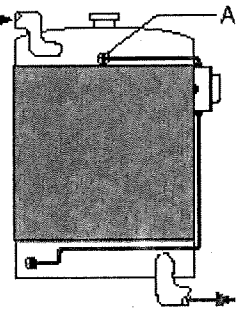


Figure 1: Pressurized System

Figure 2:
Shallow Upper Tank

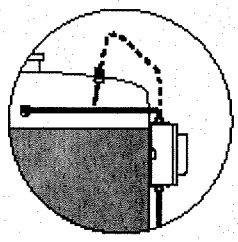
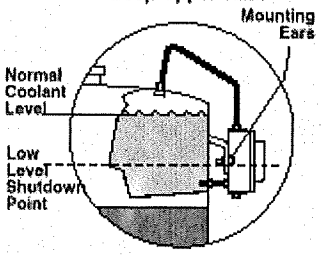


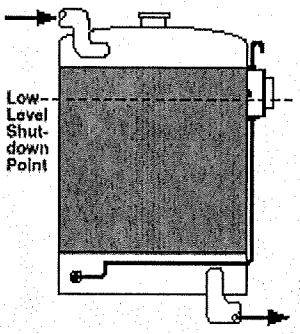
Figure 3:
Deep Upper Tank



For a PRESSURIZED system the tip of the copper tube will be the shutdown level.

3. **For ATMOSPHERIC (non-pressurized) and PRESSURIZED CROSS FLOW COOLING SYSTEMS** the shutdown point is determined by the mounting position of the L150/EL150K1 relative to the top tank of the radiator (see step 5).

Figure 4: Atmospheric System



4. For a **PRESSURIZED SYSTEM,** determine the point of entry (tube connection) in the radiator top tank (away from the top hose connection). Many radiators have a pipe nipple provided. If a connection is not provided, you must either weld or solder a fitting or use one of the Murphy PS fittings (see ***PS Fittings Installation*** page 2). This connection should be as close to the radiator core as possible.

   For MARINE AND MOBILE EQUIPMENT installations, the top tank connection should be near the vertical centerline of the radiator. This will compensate for changing level due to roll and pitch of the machine during operation.

5. **For an ATMOSPHERIC SYSTEM** a tube connection in the top tank may not be required. Determine the lowest desired level of coolant in the top tank. Mount the L150/EL150K1 so that the mounting ears are approximately 1/4 in. (6 mm) above that level (Figure 3).
   A back mounting option is available for the L150 and EL150K1 for radiators with fabricated steel top tank and/or for use with some condensor cooling systems.

   For an ATMOSPHERIC system install a 1/4 in. (6 mm) diameter tube in the top fitting of the L150/EL150K1. This tube MUST EXTEND ABOVE the top tank. Form the tube into a cane so that the open end of the tube points down but still extends ABOVE the HIGHEST coolant level. The tube can be connected to the top tank if desired. Follow instructions for a PRESSURIZED SYSTEM.

6. For most applications, the bottom tube connection is made at the drain cock. Remove the drain cock and install a brass tee. Reinstall the drain cock into the tee. Attach a copper or other suitable tube to the remaining opening of the tee and to the bottom connection of the L150/EL150K1.

   If a drain cock is not provided, you must attach a fitting or use a Murphy PS fitting the same as for the top tank instructions.

7. Wire according to appropriate alarm or shutdown circuits (see ***Standard Electrical Diagrams*** on page 4).

8. Refill the cooling system according to manufacturer's instructions.

9. Start the engine and allow it to run until the thermostat opens. Increase engine speed to the FULL operating speed and observe that the indicating pointer remains at or near the full position. If the pointer drops to the LOW position shutdown or alarm will occur due to coolant flow through the L150/EL150K1. If alarm or shutdown occurs, drain the coolant - or clamp off the upper and lower hoses.

   CAUTION: BE SURE SYSTEM PRESSURE IS RELIEVED AND HOT COOLANT CANNOT ESCAPE. Remove the four (4) mounting screws holding the cover assembly. Invert the float chamber so that the 1/2 NPT connection is on top and the 1/4 NPT connection is on bottom. Reinstall the float and cover assembly in the upright position. Install larger I.D. tubing from the top of the float chamber (1/2 NPT) to the radiator top tank. The smaller 1/4 NPT connection on the bottom will restrict coolant outflow from the L150/EL150K1. Check for unrestricted float movement by rotating the switch test knob.

   Refill the cooling system and repeat step 9.

10. Place a catch basin under the drain cock. Open the drain cock and observe that coolant is leaving the radiator.
    For a PRESSURIZED cooling system, shutdown will occur when coolant drops below the entry point of the top tank tube connection.
    For an **ATMOSPHERIC OR CROSS FLOW PRESSURIZED COOLING SYSTEM,** shutdown will occur when coolant drops approximately 1/4 in. (6 mm) below the level of the case mounting ears. If shutdown does not occur, adjust the L150/EL150K1 mounting as described above.

    CAUTION: DO NOT ALLOW ENGINE TO RUN WHEN COOLANT DRAINS BELOW THE UPPER TANK. ENGINE DAMAGE CAN OCCUR.

11. Periodically test switch operation by rotating the test knob on the face of the L150/EL150K1. Rotating the knob forces the pointer mechanism against the contact screw (L150) or the snap switch actuator (EL150K1).

Condensor/Radiator System

1. Mount the L150/EL150K1 so that the horizontal center line of the L150/EL150K1 is approximately 1/4 in. (6 mm) above the minimum coolant level in the engine head.

NOTE: On some engines it is possible to use the back connection option and attach the L150/EL150K1 directly to the engine cylinder. Kits are also available for some engines.

2. Attach a copper tube from the top connection of the L150/EL150K1 to the radiator top tank.

3. Wire and test the system according to above instructions for Pressurized and Atmospheric systems.

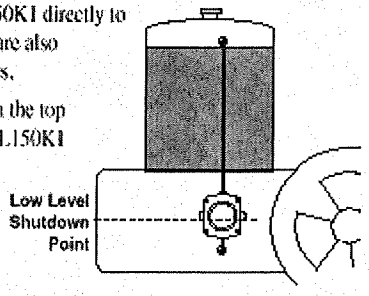
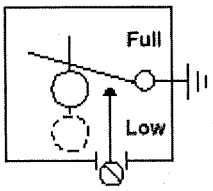


Figure 5:
Condensor/Radiator System

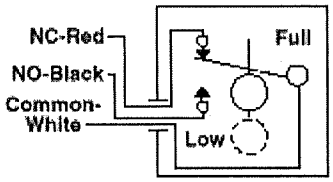
STANDARD ELECTRICAL DIAGRAMS

WARNING: PERFORM THE WIRING OPERATION WITH THE POWER SOURCE "OFF".

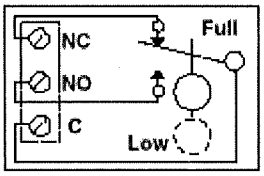
L150



EL150K1



EL150EX



NOTE: All models shown with pointer in full position.

REPAIR KITS

Repair kits are available for the L150, EL150K1 and EL150EX models. When ordering a repair kit specify model repair kit number from chart below:

Model	Components	Repair Kit No.
L150	All parts except case/body	15-00-0138
	Case/body assembly	15-00-0101
EL150K1	All parts except case/body	15-00-0139
	Lens and switch assembly	15-00-0100
	Case/body assembly	15-00-0101
EL150EX	Cover and float assembly	15-00-0110
	Lid assembly	15-00-0108
	Switch/Terminal assembly	15-00-0109

Replacing the Float and Cover Assembly for the L150 and EL150K1

WARNING: Perform the following operation with the power source "OFF". Be sure engine and radiator have cooled and coolant pressure has been relieved. SEVERE BURNS can result. Never remove radiator cap on a hot engine.

1. As applicable, shut off liquid to the SWICHGAGE® or drain the system level below the SWICHGAGE®.
2. Disconnect electrical lead(s), one at a time and tag for reinstallation.
3. Disconnect conduit on EL150K1.
4. Remove the four screws that secure the float and glass assembly to the case.
5. Remove and discard the old float and cover assembly.
6. Remove and discard the old gasket.
7. Install the new gasket.
8. Install the new float and cover assembly and secure it with four screws.
9. Re-connect the conduit on EL150K1.
10. Re-connect the electrical lead(s).
11. As applicable, open valves to the SWICHGAGE® or refill the system to proper level.
12. Check the SWICHGAGE® for proper operation at the full indicating position. (Alarm not operated/engine continues to operate.)
13. Check the SWICHGAGE®, alarm/shutdown circuit, by rotating the test knob toward the low level point of the dial: alarm is operated/engine shuts down.
14. Check for unrestricted float movement by rotating the switch test knob.
15. Replacement of the float and cover assembly is complete.

CAUTION: On some high voltage CD ignition systems, it may be necessary to coat the L150 contact screw head with RTV to prevent "tracking" and false contact operation during wet or high humidity conditions. Use of the EL150K1 is recommended in these cases.

Warning

A two year limited warranty on materials and workmanship is provided with this Murphy product. Details are available on request and are packed with each unit.

murphy
FWMurphy
P.O. Box 470248
Tulsa, Oklahoma 74147 USA
(918) 627-3550
fax (918) 664-6145
e-mail sales@fwmurphy.com
www.fwmurphy.com

CONTROL SYSTEMS & SERVICES DIVISION
P.O. Box 1819; Rosenberg, Texas 77471; USA
(281) 342-0297 fax (281) 341-5006
e-mail sales@fwmurphy.com

MURPHY DE MEXICO, S.A. DE C.V.
Blvd. Antonio Roche Cordero 300, Fracción del Aguaje
San Luis Potosí, S.L.P.; México 78384
+52-48-206264 fax +52-48-206336
e-mail ventasmex@murphymex.com.mx

FRANK W. MURPHY, LTD.
Church Rd.; Laverstock, Salisbury SP1 1QZ, U.K.
+44 1722 410055 fax +44 1722 410088
e-mail sales@fwmurphy.co.uk
www.fwmurphy.co.uk
For Service in French:
Pour service en français:
+44 1722 410097 fax +44 1722 410088
e-mail france@fwmurphy.co.uk
www.fwmurphy.co.uk/francais.htm

MURPHY SWITCH OF CALIFORNIA
41343 12th Street West
Palmdale, California 93551-1442, USA
(661) 272-4700 fax (661) 947-7570
e-mail sales@murphyswitch.com
www.murphyswitch.com

MACQUARRIE CORPORATION
1620 Ilums Highway;
Campbellfield, Vic 3061; Australia
+61 3 9358-5555 fax +61 3 9358-5558
e-mail murphy@macquarrie.com.au

In order to consistently bring you the highest quality, full featured products, we reserve the right to change our specifications and designs at any time.

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D05690N

Installation for L1100, L1200, L1200N Series Liquid Level Switches and DVU150, DVU175, and DVU2105/2115/2120 Series Dump Valves

LDV-92151N
Revised 06-04
Section 15
(00-02-0175)

Please read the following instructions before installing. A visual inspection for damage during shipping is recommended before mounting.

GENERAL INFORMATION

WARNING

BEFORE BEGINNING INSTALLATION OF THIS MURPHY PRODUCT

- ✔ Disconnect all electrical power to the machine.
- ✔ Make sure the machine cannot operate during installation.
- ✔ Follow all safety warnings of the machine manufacturer.
- ✔ Read and follow all installation instructions.
- ✔ OBSERVE all pressure and electrical ratings and requirements for the devices and the operating environment.
- ✔ BE SURE all pressure HAS BEEN REMOVED from the vessel before opening any pressure connections.

Description

CE **

Series L1100 and L1200 Liquid Level Switches are float activated to operate an electrical SPDT snap switch (optional DPDT on some models) for alarm or shutdown of an engine or electric motor. They screw directly into the wall of the vessel. Series L1200 can also be used with a weld collar or external float chamber.

Series L1200N is a float-activated, pneumatic-vent level device used to operate dump valves or similar devices. This model screws directly into the vessel or can be mounted via an external float chamber. It **cannot** be used with weld collar 15050375. Model variations include a dump valve operator with or without a filter/pressure regulator and indicating pressure gauge.

NOTE: All stainless steel versions of L1100, L1200, L1200N, L1200NDVO, and L1200NDVOR series carry Canadian Registration Number OF1476.2.

Series DVU150, DVU175, DVU2105/2115/2120 Dump Valves receive a pneumatic input signal to cause an orifice to open or close allowing liquid condensate to be drained from a pressure vessel. A pop up button indicates valve open/closed. Stainless steel versions available.

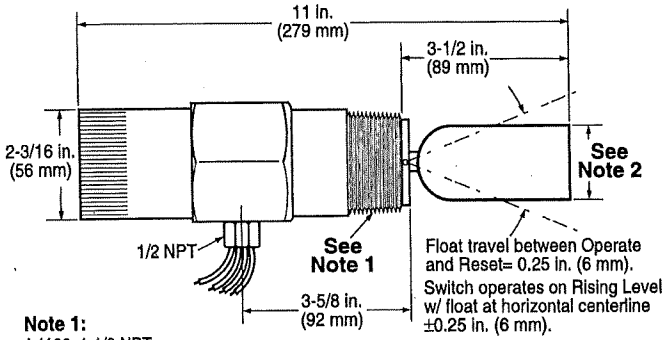
Specifications	L1100	L1111	L1200	L1200N	L1200NDVO	L1200NDVOR
Body						
• Standard: Electroless Nickel plated steel	✗ A	✗ A	✗ B	✗ B	✗ B	✗ B
• Optional: 316 Stainless Steel†	✗ A	✗ A	✗ B	✗ B	✗ B	✗ B
Pressure Rating						
• 15 psi (103 kPa) [1.03 bar] Polyethylene Float						
• 1500 psi (10.3 MPa) [103.42 bar] Stainless Float	✗	✗	✗	✗	✗	✗
• 2000 psi (13.8 MPa) [138 bar] BUOYGLAS™ Float	✗	✗	✗	✗	✗	✗
Temperature Rating						
• Standard: -20/175°F (-29/79°C)						
• Standard: -20/300°F (-29/149°C)	✗	✗	✗	✗	✗	✗
• Optional: -20/400°F (-29/204°C)*	✗		✗	✗	✗	✗
Specific Gravity						
• Standard: 0.5 with BUOYGLAS™ float	✗	✗	✗	✗	✗	✗
• Optional: 0.65 with 304 Stainless Steel†	✗		✗	✗	✗	✗
• Standard 0.73 Polyethylene Float						
Electrical						
• Standard SPDT: 5 A @ 125/480 VAC (see p. 3 for full ratings)	✗	✗	✗			
• Optional DPDT: 10 A @ 250 VAC (see p. 3 for full ratings)	✗	✗	✗			
Wire: 18 AWG x 36 in. (1.0 mm² x 914 mm)	✗	✗	✗			
O-Rings: Viton	✗	✗	✗	✗	✗	✗
Valve: Two-way snap-action vent type • 1/8 in. (3 mm) orifice w/Viton "A" seat • 1/8 NPT inlet; 1/4 NPT outlet • 30-70 psi (207-483 kPa) [2.07-4.83 bar] operating pressure				✗	✗	✗
Dump Valve Operator: Operates Murphy DV Series dump valves or similar.					✗	✗
Pressure Regulator/Filter and Murphy 20BPG: 0-75 psi (0-517 kPa) [0-5.17 bar] pressure gauge. Maximum input 300 psi (2.07 MPa) [20.68 bar].						✗
Operation: H=For high level, L=For low level	H	L	H	H	H	H

A=1-1/2 NPT B=2 NPT †Meets NACE standard MR-01-75 for direct exposure to H_2S service. *Not available with DPDT snap-switch.

**Products covered by this literature comply with EMC Council directive 89/336/EEC regarding electromagnetic compatibility.

DIMENSIONS

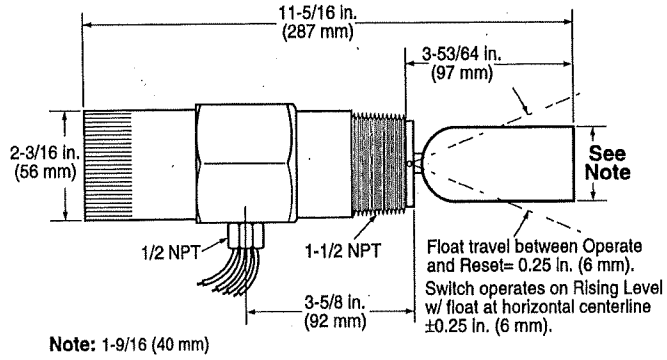
L1100 and L1200



Note 1:
L1100: 1-1/2 NPT
L1200: 2 NPT

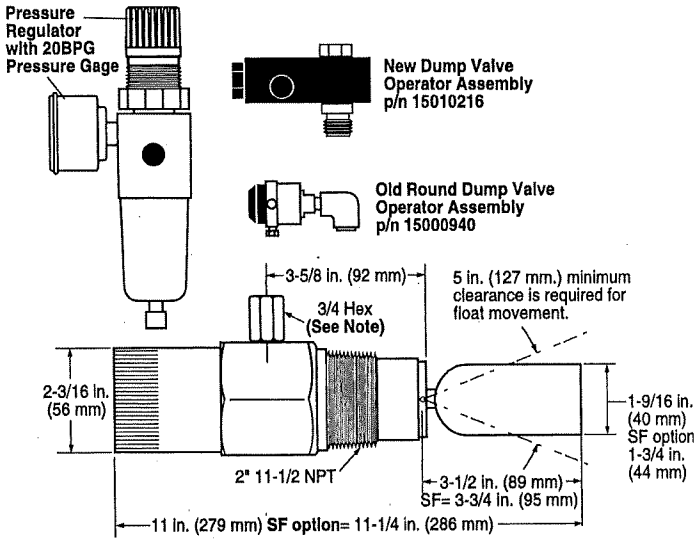
Note 2: 1-9/16 (40 mm)
SF option:
L1100: 1-1/2 (38 mm)
L1200: 1-3/4 (44 mm)

L1111



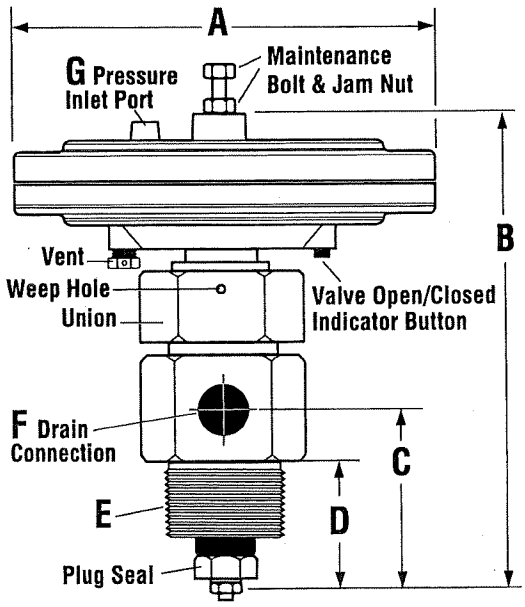
Note: 1-9/16 (40 mm)

L1200N, L1200NDVO and L1200NDVOR with Dump Valve Operator, Pressure Regulator and Gage



Note: For use only with Old Round Dump Valve Operator Assembly (15000940).

DVU150, DVU175, DVU2105/2115/2120 Series Dump Valves



	DVU150	DVU75	DVU2105	DVU2115	DVU2120
A	7.5 (191)	7.5 (191)	7.5 (191)	7.5 (191)	7.5 (191)
B	7.86 (200)	7.86 (200)	8.94 (227)	9.00 (229)	9.09 (231)
C	3.04 (77)	3.04 (77)	3.58 (91)	3.64 (92)	3.73 (95)
D	2.04 (52)	2.04 (52)	1.92 (49)	1.98 (50)	2.07 (53)
E	1-11.5 NPT	1-11.5 NPT	2-11.5 NPT	2-11.5 NPT	2-11.5 NPT
F	1/2-14 NPT	3/4-14 NPT	1-11.5 NPT	1-11.5 NPT	1-11.5 NPT
G	1/8-27 NPT	1/8-27 NPT	1/8-27 NPT	1/8-27 NPT	1/8-27 NPT

NOTE: Dimensions are in inches and (millimeters)

REPLACING AND INSTALLING THE DVOA ASSEMBLY

When replacing/installing the old style DVO assembly with the new style (DVOA), tubing and fitting modifications are required. We suggest removing the L1200NDVO/DVOR from the vessel. Relieve pressure from the vessel or use block valves before removing the L1200NDVO/DVOR.

Replacing and Installing the DVOA Assembly For Models L1200NDVO & L1200NDVOR

Tools Needed: Strap or pipe wrench; 3/4" Hex wrench; 9/16" hex wrench; needle nose pliers; tubing cutters and benders and the appropriate tools for the fittings.

1. Block off and bleed the instrument gas pressure supply to the L1200NDVO.
2. Remove the tubing between the L1200NDVO and the separator dump valve, and remove the supply gas tubing (regulator [-R] if used).
3. Remove the L1200NDVO from the vessel (optional).
4. If the L1200N was removed from the vessel, mount it in a suitable vise on a work bench (if possible).
5. Using the proper tools, disconnect the Inlet, Outlet and Exhaust fittings from the existing DVO (see fig. 1). You will re-connect these to the new DVOA in a later step.

NOTE: *The following steps must be done with the DVO in the upright position (on top of the L1200N).*

6. Remove the L1200N cover (this will aid with the alignment of the new DVOA Valve Bushing). The use of a strap wrench or a pipe wrench may be needed.
7. Insert the new Valve Bushing through the new DVOA (see fig. 2). The markings on top of the DVOA must be facing up. This will be needed in step 9.
8. With a 3/4" hex wrench loosen the existing DVO, valve stem, and static seal (see fig. 3). Once the assembly is loosened, VERY CAREFULLY use needle nose pliers to hold the Valve Seat Assembly in place. Remove the existing DVO making sure the Valve Seat Assembly inside the L1200NDVO is aligned and straight (see fig. 4).

CAUTION: MAKE SURE the Valve Seat Assembly inside the L1200N remains in place after removing the DVO.

9. Holding the Seat Assembly up with the needle nose pliers inside the L1200NDVO body, place the tip of the new DVOA valve bushing through the spring and into the hole in the center of the valve seat, and tighten the valve bushing. The Valve Seat Assembly should be able to move freely up and down after the bushing has been tighten. The DVO red button must face away from the vessel.
10. With the new DVOA aligned over the hex on the L1200NDVO body, tighten the Valve Bushing using the 9/16" hex wrench. You may need to hold the DVOA while tightening the Valve Bushing to keep it from rotating (see fig. 5).
11. If the L1200N is in the vise, operate the float and inspect for smooth and proper operation of the Valve Seat Assembly.
12. Replace the L1200NDVO cover (see fig. 6).
13. Using the appropriate tools re-install the Inlet, the Outlet and the Exhaust fittings to the new DVOA (see fig. 5).
14. If the L1200N was removed from the vessel re-install it at this time.
15. Modify existing or install new tubing to connect the Inlet, the Outlet and Exhaust fittings.

NOTE: Clean, dry instrument quality gas should be used. Use of filters will improve service life and reliability.

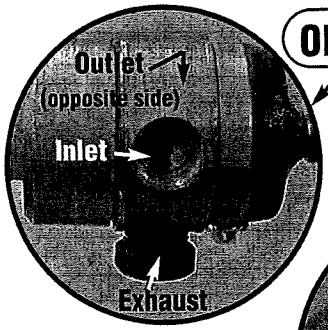


Figure 1

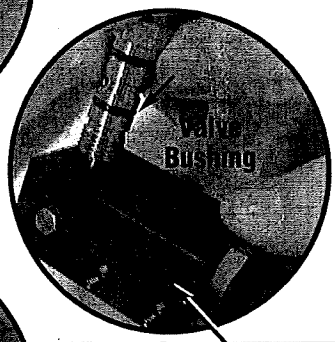


Figure 2

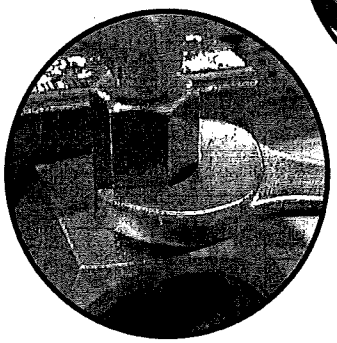


Figure 3

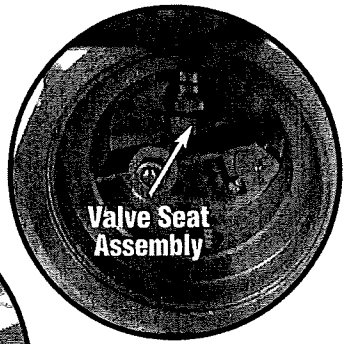


Figure 4

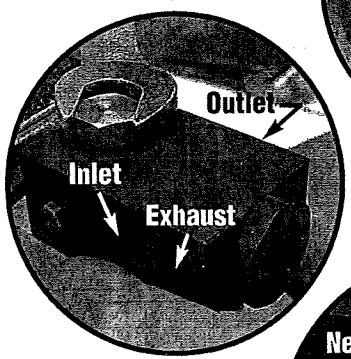


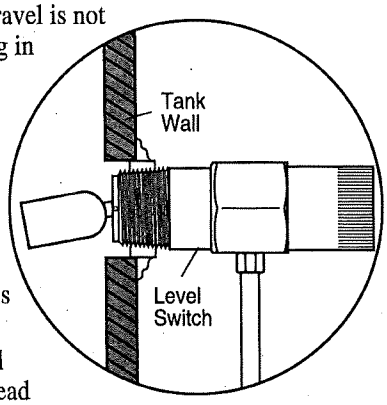
Figure 5

Figure 6

PRESSURE VESSEL INSTALLATION: L1100, L1200, and L1200N

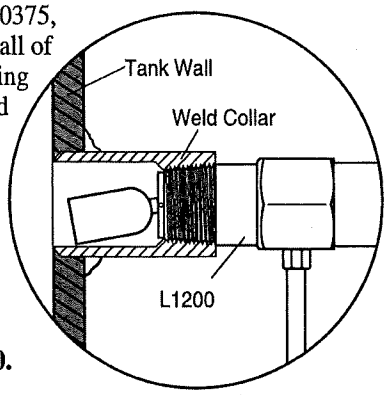
Direct Installation into the Wall of the Pressure Vessel

1. Determine that the float travel is not obstructed by the coupling in the vessel wall, internal baffles, etc. Do NOT use more than one arm extension P/N 15050395.
2. BE SURE that the float and extension are tight and that the lock washer is in place.
3. Before installing the level switch a suitable pipe thread sealant is recommended. Screw the unit directly into the threaded connection in the wall of the pressure vessel.
4. Be sure that the electrical connection is positioned at the bottom. For L1200N the 1/8 NPT pneumatic connection should be on top (the 1/4 NPT vent connection should be on the bottom). See "Pneumatic models" section for further instructions for the L1200N.
5. Make the electrical wiring connections according to appropriate wiring diagrams for the alarm or shutdown system to be used. The electrical connection is 1/2-14 NPT.
6. BE SURE all electrical connections are insulated and the cover is fully installed before reconnecting electrical power.
7. BE SURE all pressure connections are tight before pressurizing the system.



Installation with a Weld Collar

1. The weld collar, P/N 15050375, must be welded into the wall of the pressure vessel according to code standards and good welding practices.
2. Follow above instructions for installation directly into the wall of the pressure vessel.
3. **NOTE: Weld collar 15050375 can be used ONLY with model L1200.**



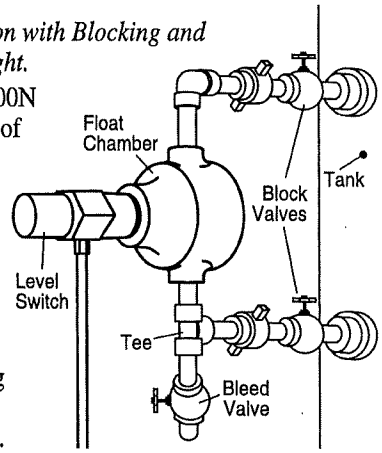
Installation Using External Float Chamber 15051098

CAUTION: USE "NON SPARKING TOOLING".

1. Install the float chamber 15051098 on the outside wall of the pressure vessel using 1 NPT piping. Position the 2 NPT threaded connection at the height where you want the level switch to operate. The 2 NPT threaded connection must be positioned away from the tank wall.
2. A tee is typically installed at the bottom of the lower 1 inch pipe riser to allow draining of the float chamber for servicing or replacement.

NOTE: A typical installation with Blocking and Bleed valves is shown at right.

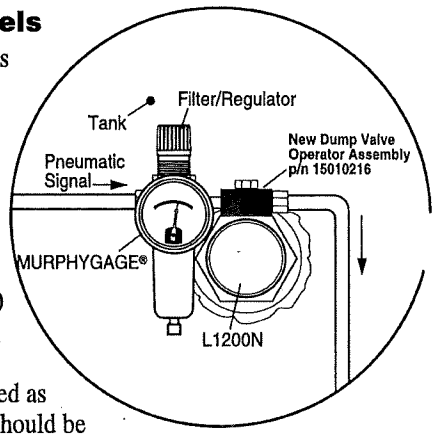
3. Install the L1200 or L1200N in the 2 NPT connection of the float chamber. BE SURE float travel is not restricted and that the float is tight onto the float shaft.
4. To complete installation and wiring, follow the instructions for mounting directly into wall of the vessel and for wiring.



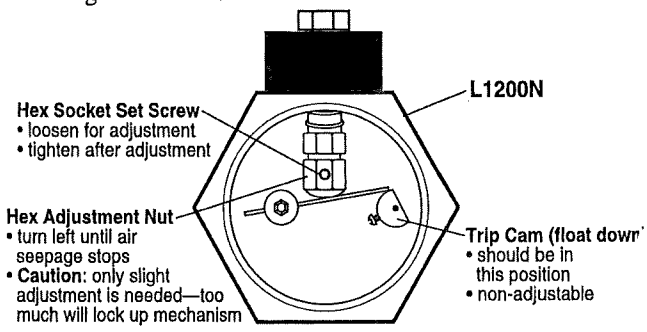
Pneumatic Models

1. All pneumatic models operate on the vent principle. The pneumatic signal source MUST BE CLEAN AND DRY. The input pneumatic signal must be regulated between 30 and 70 psi (207-483 kPa) [2.07-4.83 bar]. If produced gas is used as the signal source, it should be taken after gas passes through the final scrubber. A suitable filter must be positioned before the L1200NDVO to prevent liquids and/or particulates from entering the dump valve operator.

NOTE: Check filter periodically for wear and tear and elements that hamper the flow of the pneumatic signal.



2. All pressure connections must be tight and maintained tight so as not to leak air/gas.
3. Valve seat adjustment can be made if air/gas begins to leak. Care should be taken when adjusting as only slight movement is necessary to stop the leakage; excessive force will bind the seating mechanism.



TYPICAL INSTALLATION ON GAS COMPRESSORS

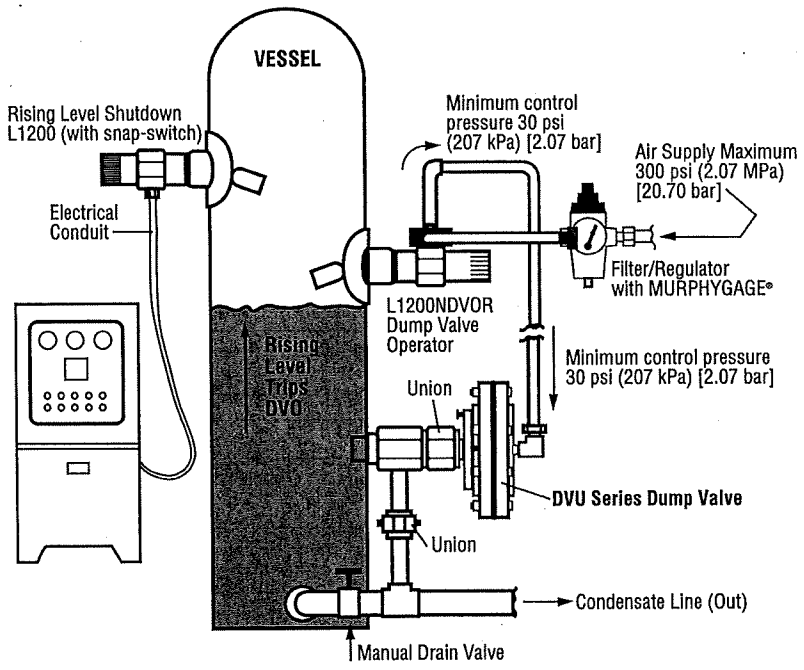
Basic Operation

As condensate rises in the scrubber, the float on the L1200NDVOR rises and trips its pneumatic valve. The valve opens allowing pressure to enter the dump valve pilot chamber. Once the pressure enters the pilot chamber it forces the diaphragm and valve stem forward thus opening the valve seat (valve open/closed indicator button pops out) and releasing condensate through the valve stem and out the drain. As the condensate level drops, the L1200NDVOR pneumatic valve closes to shut off the pressure to the dump valve causing it to close.

If for any reason the condensate continues to rise beyond normal dump levels, model L1200 operates the alarm and/or shuts down the equipment.

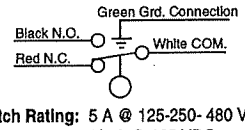
The L1200NDVOR Filter/Regulator and the MURPHYGAGE® help keep the control pressure clean and dry. They also allow the operator to adjust pressure to recommended levels.

Typical/Scrubber/Separators



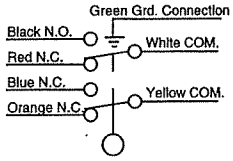
ELECTRICAL INFORMATION

SPDT (Snap Switch)



Switch Rating: 5 A @ 125-250- 480 VAC
1/2 A @ 125 VDC
1/4 A @ 250 VDC
2A @ 6-30 VDC Resistive
1A @ 6-30 VDC Inductive

DPDT (Snap Switch)



Switch Rating: 10 A @ 125-250 VAC
1/2 A @ 125 VDC
1/4 A @ 250 VDC
10 A @ 6-24 VDC
Inductive/Resistive

REPLACEMENT PARTS

Order by part number designation.

L1100/L1200*

15000893: *BUOYGLAS™ float*
15000894: *Stainless Steel float for L1200*
15000937: *Stainless Steel float for L1100*
15000124: *SPDT snap switch assembly*
15010213: *L1100 counter balance assembly*
15010214: *L1200 counter balance assembly*

L1200N

15050420: *Cam spring return*
15050421: *Cam*
15000893: *BUOYGLAS™ float*
15000894: *Stainless Steel float for L1200N*
15050453: *Valve stem*
15010189: *Counter balance assembly*

L1200NDVO and L1200NDVOR

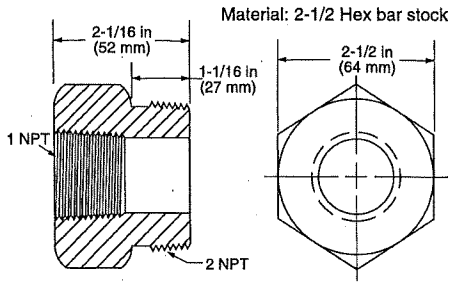
55050621: *Regulator only*
05706499: *20BPG-D-75 Pressure MURPHYGAGE®*
0-75 psi (517 kPa) [5.17 bar]
15010216: *DVOA assembly (New rectangular style)*
15000940: *DVO assembly (Old round style)*

*To maintain hazardous location listings, all other repairs must be made by the factory.

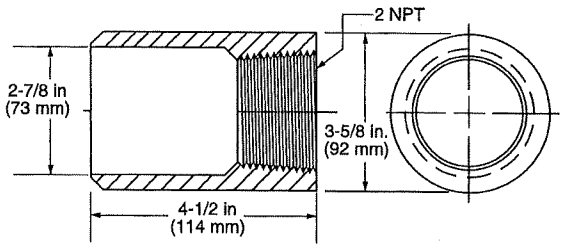
ACCESSORIES

Order by part number designation.

55050617: DVU150/DVU175 Adapter Bushing

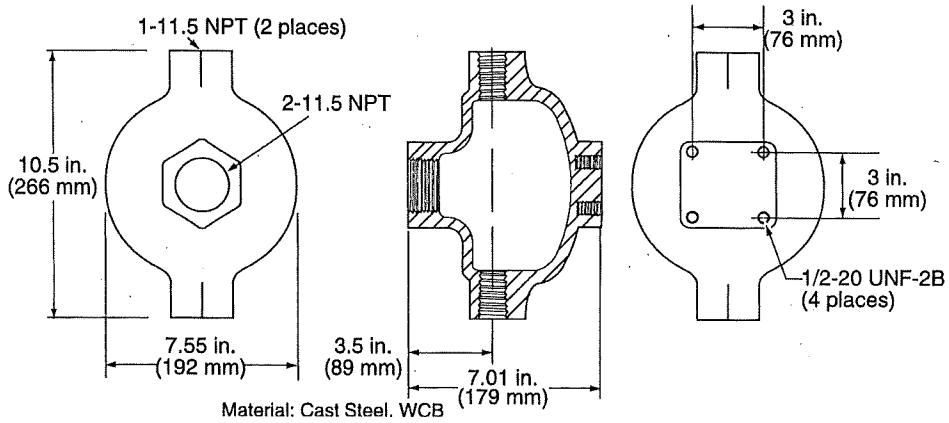


15050375: Weld Collar



Operating Pressure: 2000 psi (13.8 MPa) [138 bar].
Operating Temperature: 400°F (204°C).

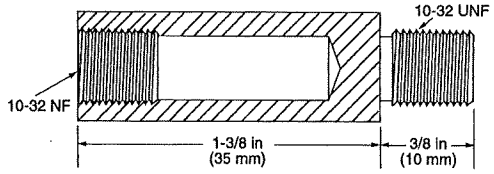
15051098: External Float Chamber



Material: Cast Steel. WCB

Operating Pressure: 2000 psi (13.8 MPa) [138 bar].
Operating Temperature: 400°F (204°C).

15000892: Float Shaft Extension



Warranty

A limited warranty on materials and workmanship is given with this FWMurphy product.
A copy of the warranty may be viewed or printed by going to www.fwmurphy.com/warranty.asp.

murphy
FWMurphy
P.O. Box 470248
Tulsa, Oklahoma 74147 USA
+1 918 317 4100
fax +1 918 317 4266
e-mail sales@fwmurphy.com
www.fwmurphy.com

CONTROL SYSTEMS & SERVICES DIVISION
P.O. Box 1819; Rosenberg, Texas 77471; USA
+1 281 633 4500 fax +1 281 633 4588
e-mail sales@fwmurphy.com

MURPHY DE MEXICO, S.A. DE C.V.
Blvd. Antonio Rocha Cordero 300, Fracción del Aguaje
San Luis Potosi, S.L.P.; México 78384
+52 444 8206264 fax +52 444 8206336
Villahermosa Office +52 993 3162117
e-mail ventas@murphymex.com.mx
www.murphymex.com.mx

FRANK W. MURPHY, LTD.
Church Rd.; Laverstock, Salisbury SP1 1QZ; U.K.
+44 1722 410055 fax +44 1722 410088
e-mail sales@fwmurphy.co.uk
www.fwmurphy.co.uk

MURPHY SWITCH OF CALIFORNIA
41343 12th Street West
Palmdale, California 93551-1442; USA
+1 661 272 4700 fax +1 661 947 7570
e-mail sales@murphyswitch.com
www.murphyswitch.com

MACQUARRIE CORPORATION
1620 Hume Highway
Campbellfield, Vic 3061; Australia
+61 3 9358 5555 fax +61 3 9358 5558
e-mail murphy@macquarrie.com.au

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(00-02-0206)

M2582, M5081, and M5180 Series Electromechanical and Pneumatic, Fuel Gas Shut-off Valves Installation and Operation Instructions

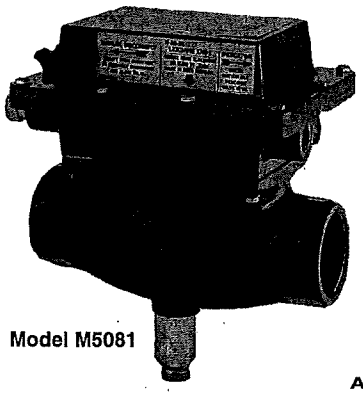
Please read the following instructions before installing. A visual inspection of this product for damage during shipping is recommended before mounting. It is your responsibility to have a qualified person install the unit and make sure installation conforms with NEC and local codes.

GENERAL INFORMATION

WARNING

BEFORE BEGINNING INSTALLATION OF THIS MURPHY PRODUCT

- ✔ Disconnect all electrical power to the machine.
- ✔ Make sure the machine cannot operate during installation.
- ✔ Follow all safety warnings of the machine manufacturer.
- ✔ Read and follow all installation instructions.



Model M5081

Approved*

M2582 and M5081Series

Tripping Power From Engine Ignition System or Battery (Models available for magneto, CD ignition or 12/24 V battery)

These fuel shut-off valves are semi-automatic devices for shutdown of natural gas fueled engines. The standard valve opens by manual operation of the reset handle. A latch in the upper body of the valve will set and hold the valve open. At this point no electric power is used. The electromagnetic coil is de-energized, the snap-switch(es) is SET.

If a SWICHGAGE® contact closes, a circuit is completed from power through the snap-switch and coil. Now energized, the electromagnet trips the latch, (latch can be tripped manually), the valve closes, and the snap-switch resets. Power switches from the coil circuit to your choice of an open line, an electrical ground, or an alarm. After tripping, the vent seal opens, and on the M50 models, the open/close indicator (green button) retracts to indicate that the valve is closed.

Valve body is sandcast aluminum. Optional cast steel for M5081 models.

M2582-P and M5180-P

MURPHY-NUMATIC™ Pneumatic Version for Pressure

The M2582-P and M5180 pneumatically controlled valves can operate from pressure, and are designed to open and close automatically or semi-automatically (the supply can be air, oil or gas).

NOTE: If using oil as a pressure source, use a lightweight oil.

These valves will open on rising control pressure and close on decreasing control pressure. M2582-P and M5180-P automatically open at 2 psi (14 kPa) [0.14 bar] and fully open at 3 psi (21 kPa) [0.21 bar].

All models include a built-in lever to aid in opening the valve manually. The M2582-P can be manually opened against inlet pressure of 80 psi (552 kPa) [5.52 bar]. The M5180-P valve can be opened against inlet pressure of 100 psi (689 kPa) [6.89 bar].

Standard models include an escape vent for gas trapped forward in the line after shut-off.

M5081FS

Normally Energized Circuit

The M5081FS is manually opened, electrically latched open and tripped by interrupting the coil power circuit.

Magnetic Switch Adapter

As ignition systems wear from usage, their power output becomes less and less. Ignition may not have the capacity to reliably trip the Fuel Valve. Therefore, the use of a Magnetic Switch Adapter for *CD ignition systems* is recommended. The Magnetic Switch Adapter is a device that stores energy from the CD ignition to trip the Fuel Valve. Three models are available:

65700053 (was 65020126): For use with negative ground ignitions up to 240 VDC.

65700054 (was 65020127): For use with positive ground ignitions up to 450 VDC.

65700055 (was 65020155): For use with negative ground ignitions up to 450 VDC.

100 ohm, 2 watt Resistor

For Capacitor Discharge Ignitions that are specified to be grounded when the valve closes, and a Magnetic Switch Adapter is in use. The resistor must be connected in the system to prevent damage to the snap-switches in the fuel shut-off valve (see typical wiring diagrams).

Diode Package

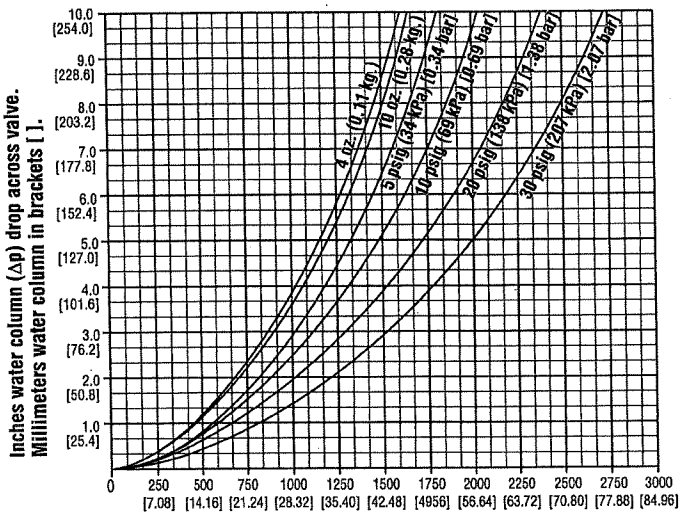
The Murphy diode package (**65010065**) is designed to allow the fuel shut-off valve to be used with dual Magneto Ignition systems.

NOTE: All aluminum versions of the M5081 Series Fuel Valve carry Canadian Registartion Number OC1476.2.

* *M5081 model is CSA approved for Class I, Division 1, Groups C and D. See Specifications on page 12.*

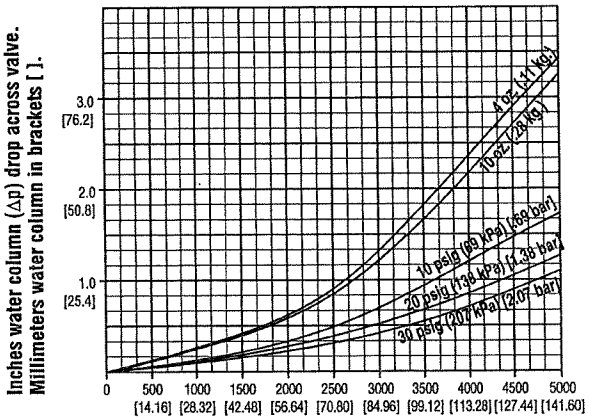
FLOW CHARACTERISTICS

M2582 Series



Standard cubic feet per hour. Cubic meters per hour in brackets [ ].

M5081 and M5180 Series



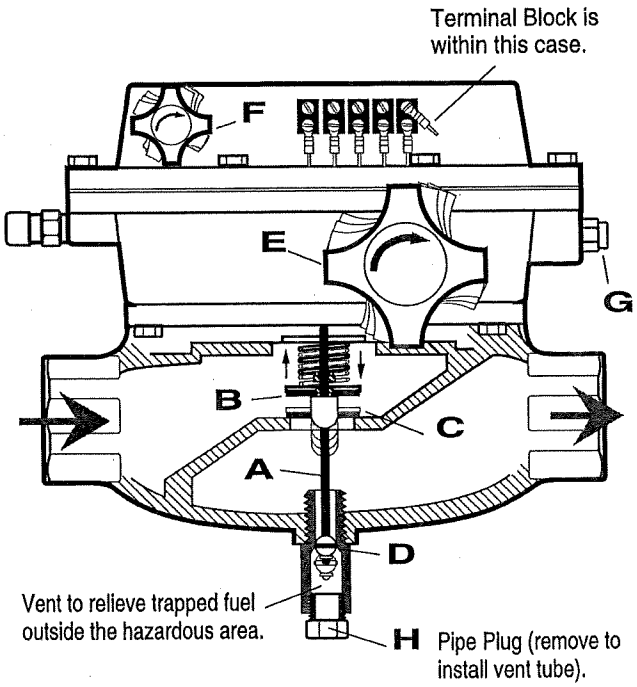
Standard cubic feet per hour. Cubic meters per hour in brackets [ ].

VALVE CUT-OUT

Understanding the Basic Operation of the Fuel Shut-off Valve

The valve below is shown in the run (open) position. Pressure is equalized, seat (**B**) is open, allowing the fuel to flow. When valve is in the tripped position (closed), seat closes (**C**).
The vent (**D**) opens to relieve trapped downstream fuel to vent to a non-hazardous area.

TYPICAL MODEL (M5081) SHOWN



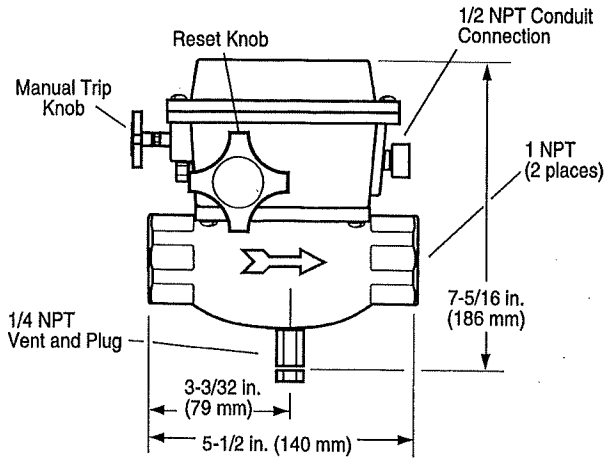
- **A.** Main Stem
- **B.** Pressure Disc/seal (in run/open)
- **C.** Pressure Disc/seal (in trip/closed)
- **D.** Vent Seal Gland
- **E.** Reset Knob (latches valve open)
- **F.** Manual Trip Knob (not available for M5081FS)
- **G.** Indicator Button (out with valve open)
- **H.** Pipe Plug

NOTE: If the vent-after-tripping feature is not used, remove O-ring (**D**), to avoid condensation accumulation that can hamper trip action.
Be sure to replace Pipe Plug (**H**) and to clean vent periodically.

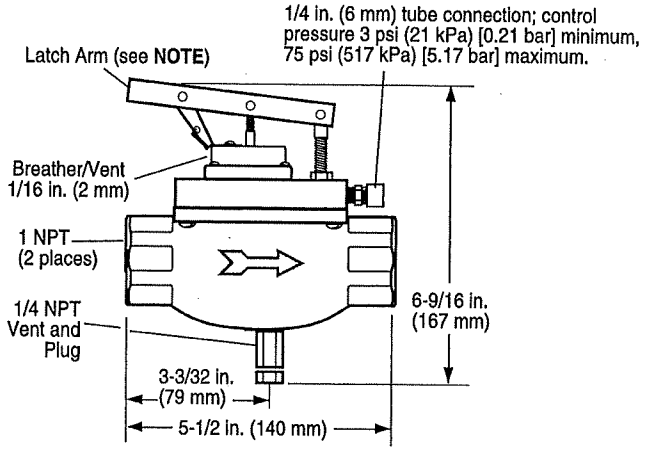
DIMENSIONS

CAUTION: THE ARROW ON THE SIDE OF THE FUEL VALVE **MUST** POINT TO THE CORRECT DIRECTION OF THE FLOW, FROM FUEL SOURCE TO THE ENGINE. APPLY PIPE DOPE **ONLY** TO FUEL PIPE, **NOT** TO THE FUEL VALVE.

M2582

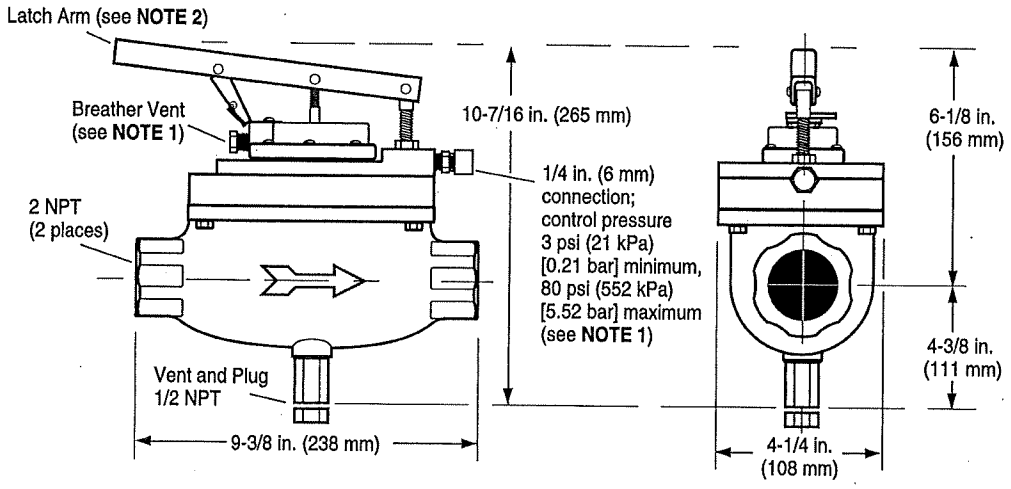


M2582-P



NOTE: Thumb operated opening latch (2.5 psi [17 kPa] [0.17 bar] required to release cocking latch)

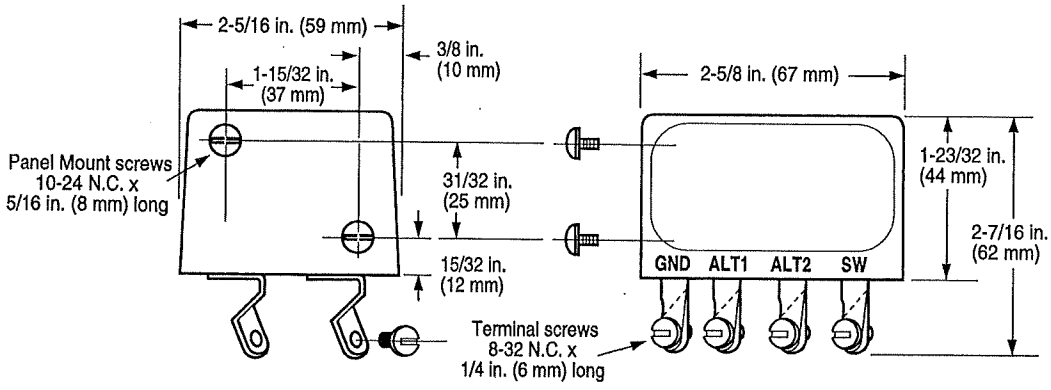
M5180-P



NOTE 1: Control pressure connection fitting and breather vent fitting can be swapped to convert to vacuum control.
NOTE 2: Thumb operated opening latch (2.5 psi [17 kPa] [0.17 bar] required to release cocking latch).

Magnetic Switch Adapters

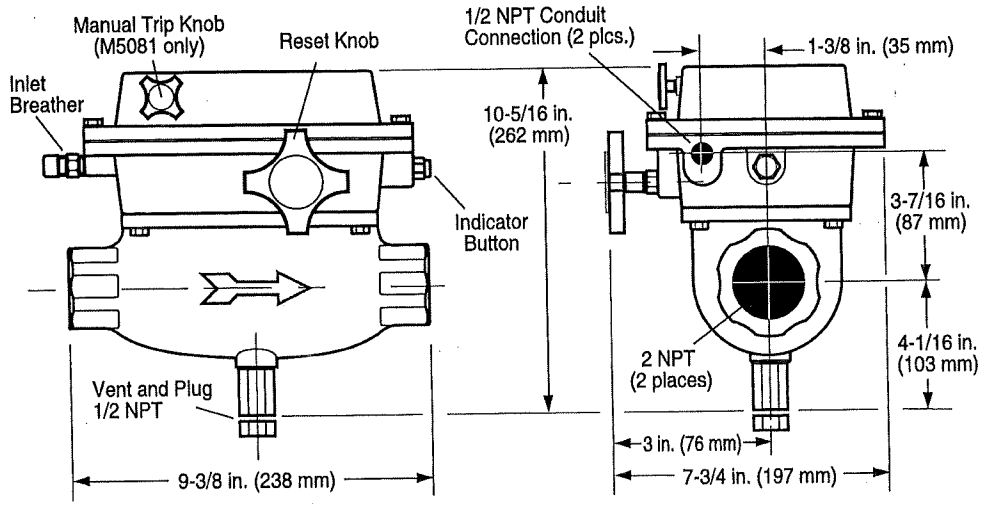
65700053 (was 65020126)**; 65700054** (was 65020127)**; 65700055** (was 65020155)



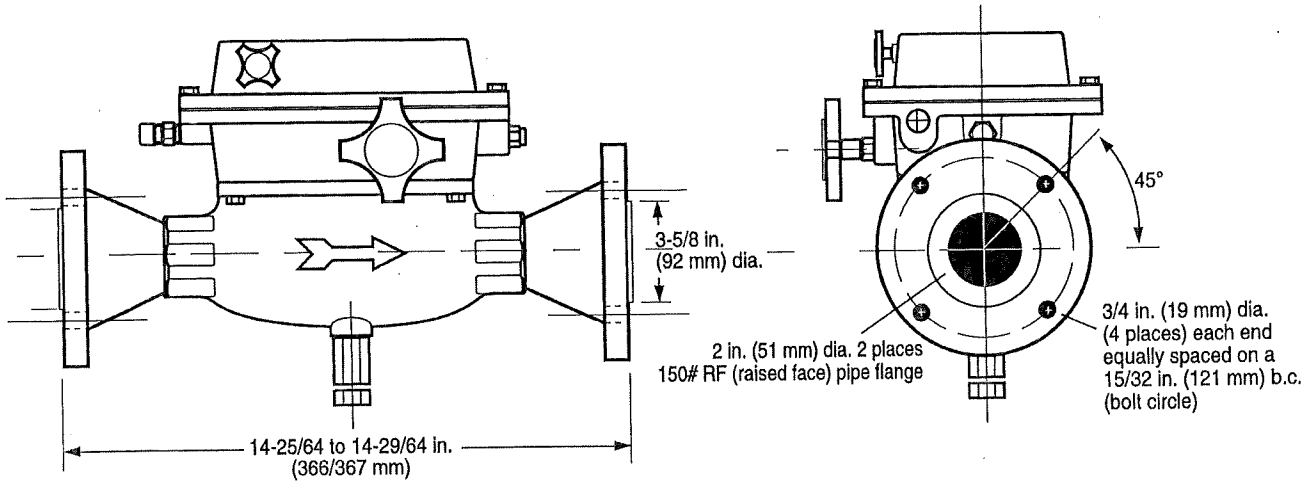
DIMENSIONS *continued*

CAUTION: THE ARROW ON THE SIDE OF THE FUEL VALVE **MUST** POINT TO THE CORRECT DIRECTION OF THE FLOW, FROM FUEL SOURCE TO THE ENGINE. APPLY PIPE DOPE **ONLY** TO FUEL PIPE, **NOT** TO THE FUEL VALVE.

M5081 and M5081FS



M5081-3 Steel Flanged Option



WARNING: STOP THE ENGINE AND DISCONNECT ALL ELECTRICAL POWER BEFORE BEGINNING INSTALLATION. BEGIN THE INSTALLATION BY SECURING AREA OF ANY HAZARDOUS CONDITIONS. SHUTOFF THE FUEL GAS SUPPLY. FOR HAZARDOUS APPLICATIONS REFER TO NATIONAL ELECTRICAL CODE SPECIFICATIONS.

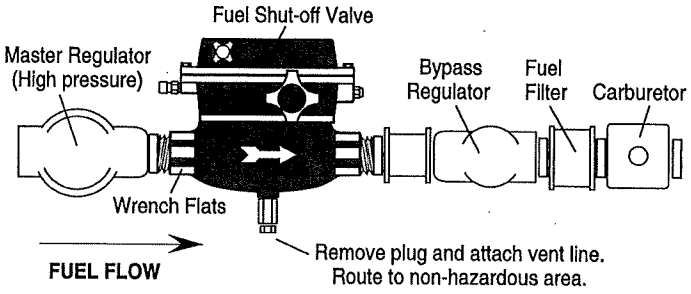
Connecting the Fuel Shut-off Valve

1. Before connecting the unit, apply pipe dope to plumbing male threads that will be inserted into the valve. Do **not** apply pipe dope to the valve.
2. Make sure that the arrow on the side of the valve indicates the correct direction of the flow.
3. Fuel shut-off valves can be installed in all three planes. However, mounting the valve horizontally (with vent pointing down) is recommended. Do **not** install valve with top down. *(Refer to **Figure 1**.)*
4. Hold valve in position, (use a tool on valve wrench flats) and tighten plumbing into inlet and outlet ends. *(Refer to dimensions on pages 3-4.)*

CAUTION: DO NOT TWIST THE VALVE BODY HOUSING.

5. To mount flanged models, follow the appropriate installation codes and ordinances for the application. *(For dimensions see page 4.)*
6. A vent line (to allow gas trapped forward between fuel valve and the carburetor to escape) should be attached to the vent connection at the bottom of the valve housing. Remove the plug and install the line. *(Refer to **Figure 1**.)*

Figure 1
Physical Location and Plumbing (typical)



Connecting Pneumatic Models

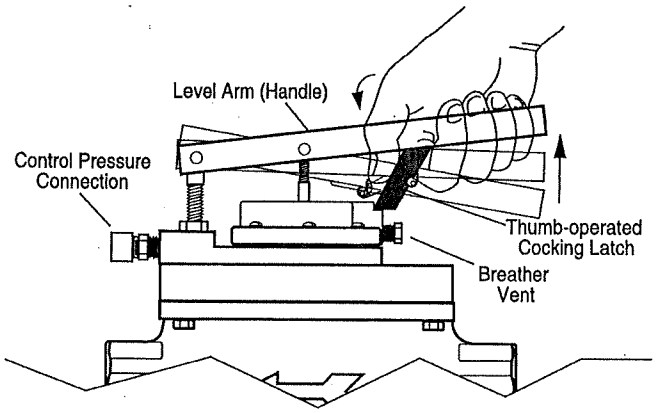
M2582-P and M5180-P

1. Repeat the steps above (1 thru 5), and observe the necessary cautions.
2. A lever/arm (handle) and a cocking latch are provided to allow manual opening of the valve. The thumb-operated latch can be locked in place to hold the lever/arm latched. The cocking latch will be released when pilot pressure reaches 2.5 psi (17 kPa) [0.17 bar]). M2582-P and M5180-P automatically open at 2 psi (14 kPa) [0.14 bar], and fully open at 3 psi (21 kPa) [0.21 bar]. See Specifications, page 12 for maximum control pressure.

CAUTION: BE SURE PNEUMATIC SOURCE RELEASES THE MECHANICAL LATCH WHEN RUNNING.

3. If vacuum control is desired, swap the Control Pressure connection fitting and the Breather Vent fitting on your M5180-P model (see **Fig. 2**).

Figure 2
Pull the lever up, and press the latch down into ridge with thumb.



WIRING INFORMATION

WARNING: PERFORM THE WIRING OPERATION WITH THE POWER SOURCE "OFF" AND THE AREA MADE NON-HAZARDOUS. MAKE SURE THE VOLTAGE AND CURRENT REQUIREMENTS ARE WITHIN THE FUEL SHUT-OFF VALVE RATINGS. HARD CONDUIT WITH APPROVED SEALS IS REQUIRED BY THE NEC FOR HAZARDOUS AREA INSTALLATIONS.

M2582 Internal Wiring

Wiring shown in normal mode of operation (seat open). The 20 AWG (0.75 mm²) wire is color coded to the coil:

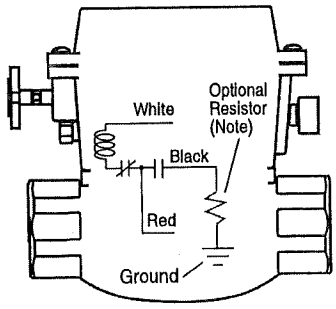
For CD ignitions: White and Orange
For Magneto ignitions: White and Green.
For Battery: White and Blue

Conduit Installation

Install a 1/2 NPT conduit from the M2582 conduit connection to the power source. See M2582 Dimensions (page 3) for location.

For wiring the M2582 fuel valve to Solid-State TATTLETALE® annunciators, refer to pages 9, 10, and 11.

Internal Wiring for M2582



NOTE:
For grounding the ignition (CD models only) through the fuel valve snap-switch, use a Magnetic Switch Adapter (see **Magnetic Switch Adapter**, below) and install a 100 ohm; 2 watt resistor (included on page 11).

M5081 Internal Wiring

Wiring shown in normal mode of operation (seat open). The 18 AWG (1.0 mm²) wire is color coded to the coil:

For CD Ignitions: White and Orange
For Magneto Ignitions: White and Green
For Battery: White and Blue

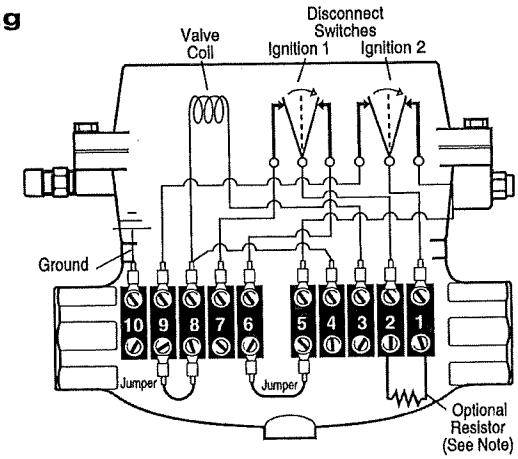
Conduit Installation

Install a 1/2 NPT conduit from the M5081 conduit connection to the power source. Refer to Dimensions (on page 4) for location.

For typical wiring of the M5081 models refer to pages 7 and 8.

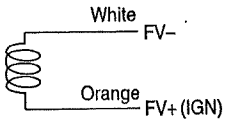
For wiring the M5081 fuel valves to Solid-State TATTLETALE® annunciators, refer to pages 9, 10, and 11.

M5081 Internal Wiring

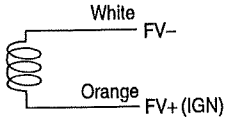


NOTE: For grounding the ignition (CD models only) through the fuel valve snap-switches, use a Magnetic Switch Adapter, see Magnetic Switch Adapter, below and the "TO CLOSE THE FUEL VALVE and GROUND THE IGNITION" attachment, and install a 100 ohm; 2 watt resistor (included with your attachment).

M2582-C-LS Wiring



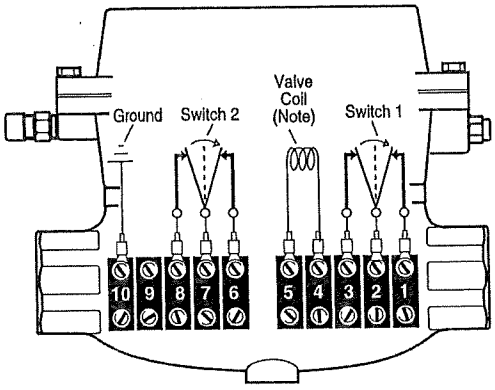
M5081-C-LS Wiring



M5081FS Internal Wiring

For typical Wiring refer to page 8.

For wiring the M5081FS to MARK IV 12/24 refer to page 10.



NOTE: Wiring shown in normal mode of operation (seat open). The 18 AWG (1.0 mm²) wire is red color for both options: 12 VDC and 24 VDC.

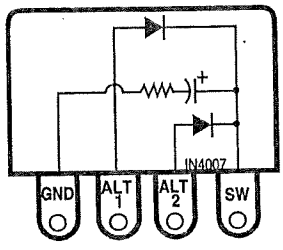
Magnetic Switch Adapters for Use with Capacitor Discharge Ignitions

Connect the Magnetic Switch Adapter between the fuel Valve terminal 1 and the CD Ignition. See wiring diagrams (pages 7 and 11).

65700053 (was 65020126): For use with negative ground ignitions up to 240 VDC.

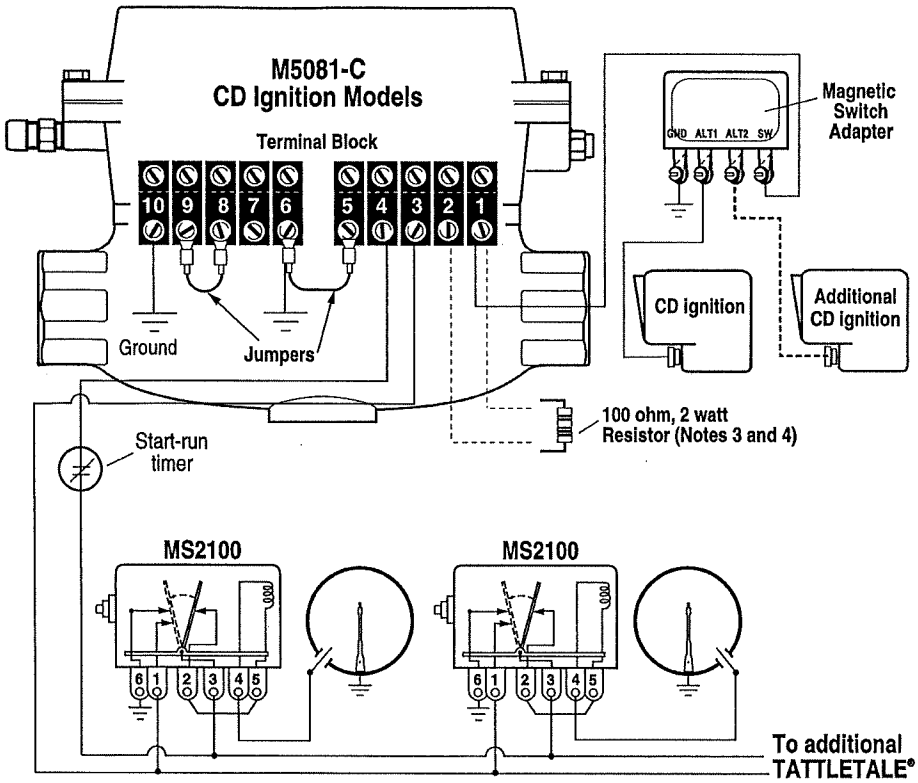
65700054 (was 65020127): For use with positive ground ignitions up to 450 VDC.

65700055 (was 65020155): For use with negative ground ignitions up to 450 VDC.



Negative ground Magnetic Switch Adapter shown

TYPICAL WIRING for M5081-C (CD IGNITION MODELS)



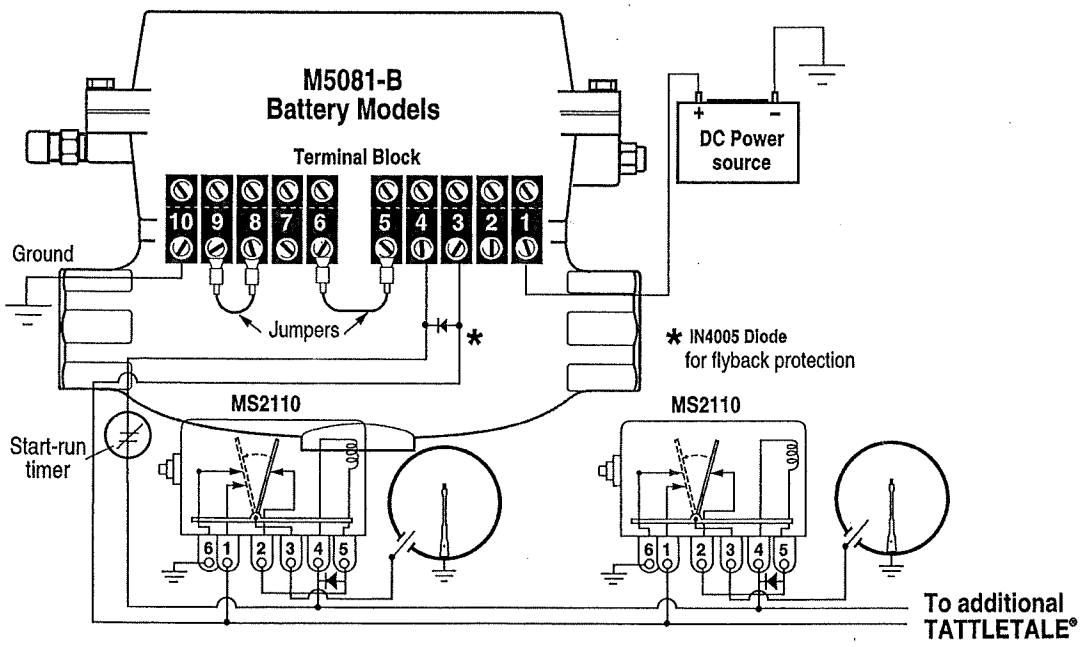
NOTE 1: *To CLOSE FUEL VALVE–NOT GROUNDING THE IGNITION (Single CD Ignition Systems) Remove the factory-installed jumper on terminals 6-5. Do NOT ground terminal 6.*

NOTE 2: *To CLOSE FUEL VALVE–NOT GROUNDING THE IGNITIONS (Dual CD Ignition Systems) Remove the jumper on terminals 6-5. Connect second ignition to Magnetic Switch Adapter terminal ALT2.*

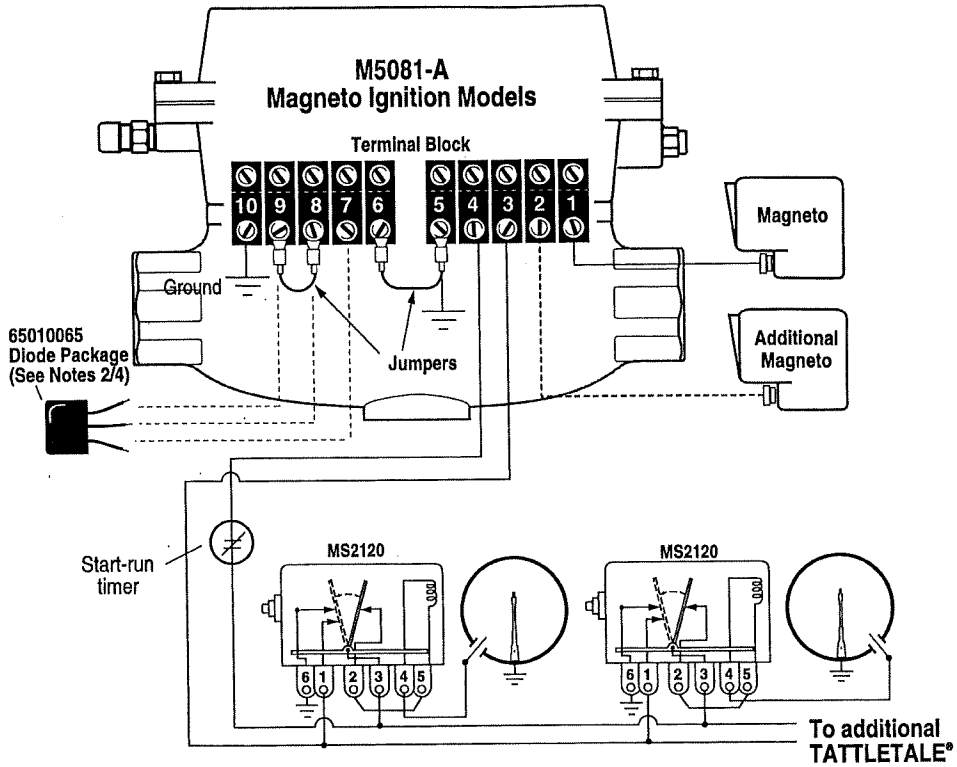
NOTE 3: *To CLOSE FUEL VALVE and GROUND THE IGNITION (Single CD Ignition Systems) Remove the jumper on terminals 6-5. Connect a 100 ohm, 2 watt resistor between valve terminals 1-2. Ground terminal 6.*

NOTE 4: *To CLOSE FUEL VALVE and GROUND THE IGNITION (Dual CD Ignition Systems) Remove the jumper on terminals 6-5. Connect a 100 ohm, 2 watt resistor between valve terminals 1-2. Ground terminal 6. Connect second ignition to Magnetic Switch Adapter terminal ALT2.*

TYPICAL WIRING for M5081-B (BATTERY IGNITION MODELS)



TYPICAL WIRING for M5081-A (MAGNETO IGNITION MODELS)



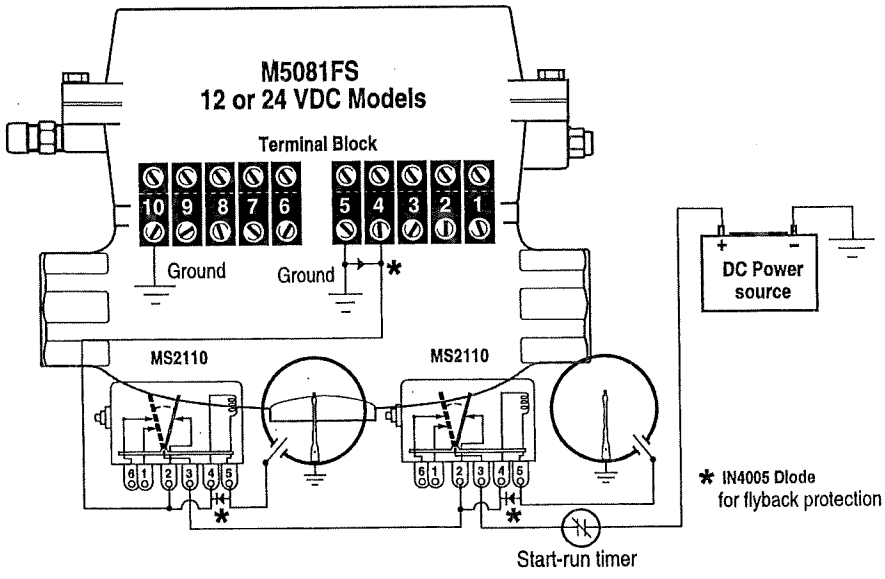
NOTE 1: *To CLOSE FUEL VALVE–NOT GROUNDING THE IGNITION (Single Magneto Systems) Remove the factory-installed jumper on terminals 6-5. Do NOT ground terminal 5.*

NOTE 2: *To CLOSE FUEL VALVE–NOT GROUNDING THE IGNITIONS (Dual Magneto Systems) Remove the factory-installed jumpers on terminals 6-5 and 9-8. Add 65010065 diode package as shown. Do NOT ground terminals.*

NOTE 3: *To CLOSE FUEL VALVE and GROUND THE IGNITION (Single Magneto Systems) The factory-installed jumpers (6-5 and 9-8) must be in place. Add ground wire to terminal 5.*

NOTE 4: *To CLOSE FUEL VALVE and GROUND THE IGNITION (Dual Magneto Systems) Remove the jumper on terminals 9-8. Add 65010065 diode package as shown. Add ground wire to terminal 5.*

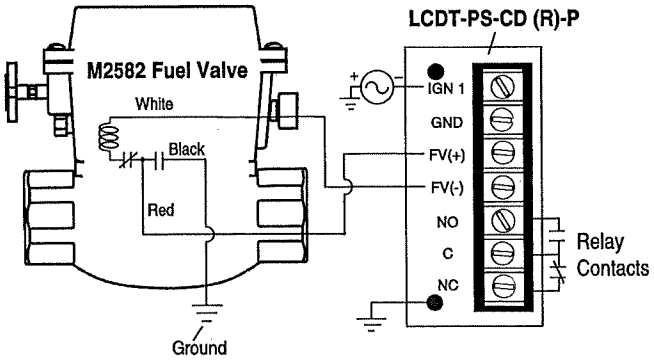
TYPICAL WIRING for M5081FS (NORMALLY ENERGIZED MODELS)



TYPICAL WIRING to SOLID-STATE TATTLETALE® Annunciators

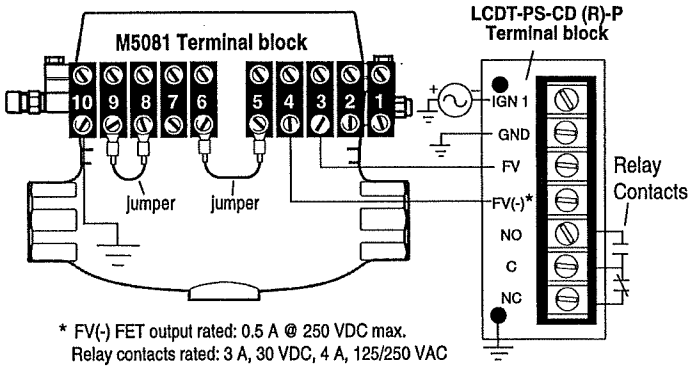
WARNING: PERFORM THE WIRING OPERATION WITH THE POWER SOURCE "OFF" AND THE AREA MADE NON-HAZARDOUS. MAKE SURE THE VOLTAGE AND CURRENT REQUIREMENTS ARE WITHIN THE FUEL SHUT-OFF VALVE RATINGS. HARD CONDUIT WITH APPROVED SEALS IS REQUIRED BY THE NEC FOR HAZARDOUS AREA INSTALLATIONS.

M2582-C to LCDT-PS-CD (R)-P (positive ground)



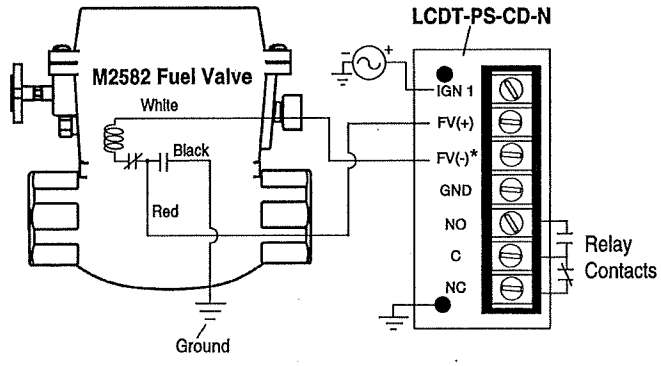
Relay contacts rated: 3 A, 30 VDC, 4 A, 125/250 VAC

M5081-C to LCDT-PS-CD (R)-P (positive ground)



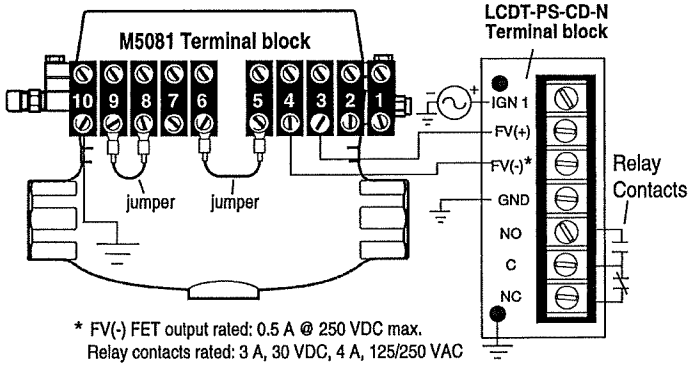
* FV(-) FET output rated: 0.5 A @ 250 VDC max.
Relay contacts rated: 3 A, 30 VDC, 4 A, 125/250 VAC

M2582-C to LCDT-PS-CD-N (negative ground)



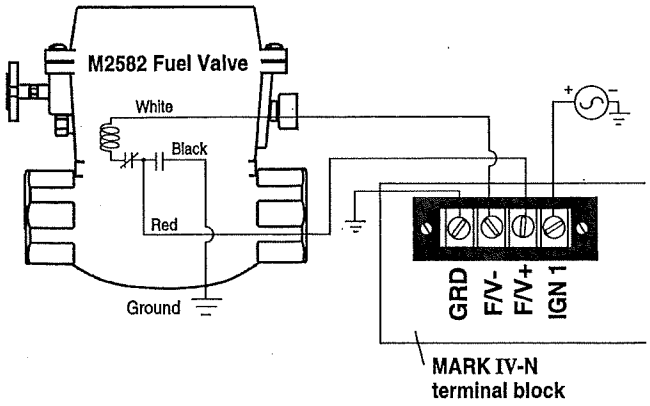
* Relay contacts rated: 3 A, 30 VDC, 4 A, 125/250 VAC

M5081-C to LCDT-PS-CD-N (negative ground)

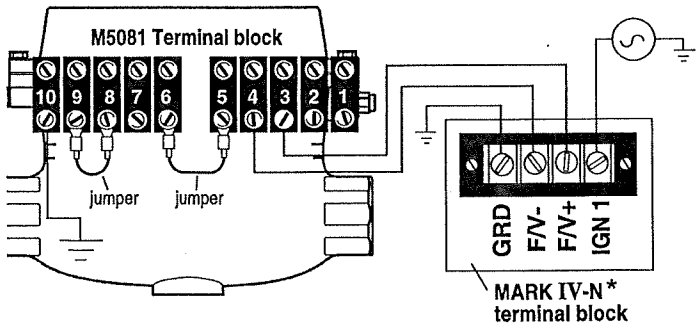


* FV(-) FET output rated: 0.5 A @ 250 VDC max.
Relay contacts rated: 3 A, 30 VDC, 4 A, 125/250 VAC

M2582-C to MARK IV-N (negative ground)



M5081-C to MARK IV-N (negative ground)

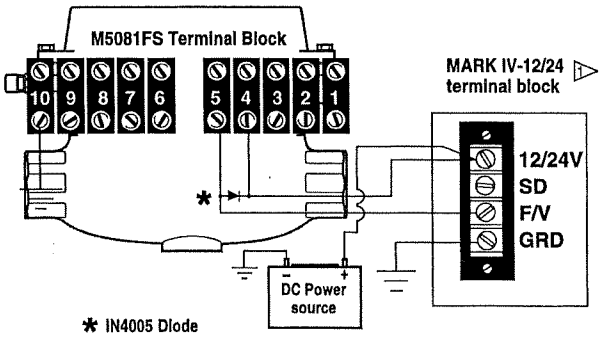


*MARK IV has FET outputs rated: 0.5 A @ 250 VDC max.

TYPICAL WIRING to SOLID-STATE TATTLETALE® Annunciators

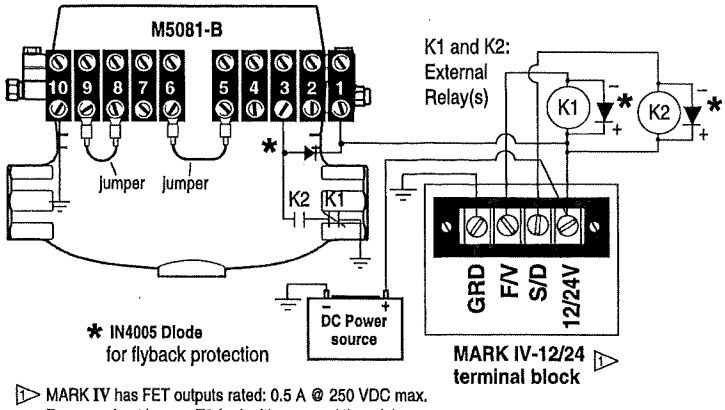
WARNING: PERFORM THE WIRING OPERATION WITH THE POWER SOURCE "OFF" AND THE AREA MADE NON-HAZARDOUS. MAKE SURE THE VOLTAGE AND CURRENT REQUIREMENTS ARE WITHIN THE FUEL SHUT-OFF VALVE RATINGS. HARD CONDUIT WITH APPROVED SEALS IS REQUIRED BY THE NEC FOR HAZARDOUS AREA INSTALLATIONS.

M5081FS to MARK IV-12/24



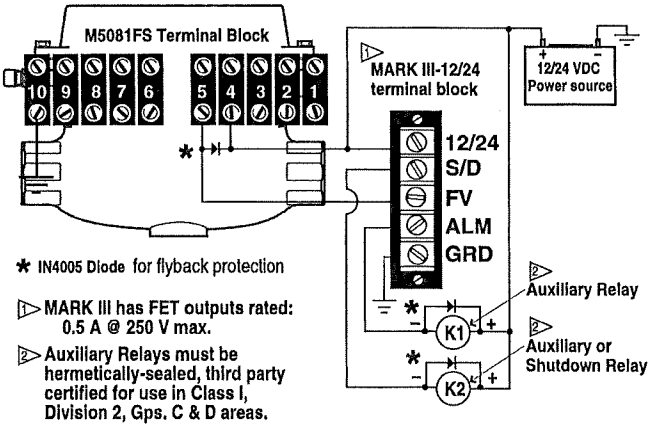
▷ MARK IV has FET outputs rated: 0.5 A @ 250 VDC max.

M5081-B to MARK IV-12/24



▷ MARK IV has FET outputs rated: 0.5 A @ 250 VDC max.
Remove shunt jumper E2 for ignition ground time delay.

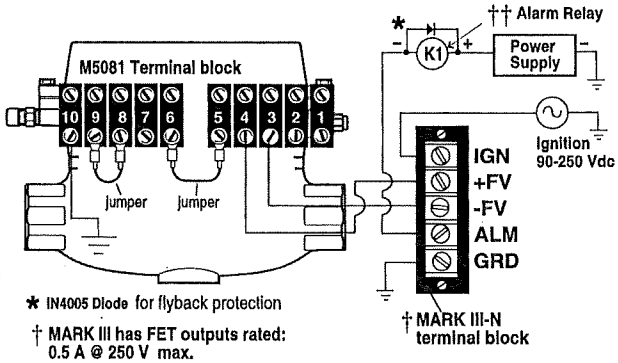
M5081FS to MARK III-12/24



▷ MARK III has FET outputs rated: 0.5 A @ 250 V max.

▷ Auxiliary Relays must be hermetically-sealed, third party certified for use in Class I, Division 2, Gps. C & D areas.

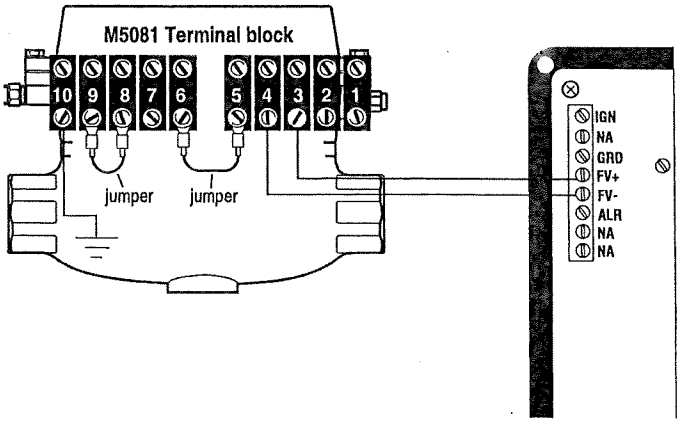
M5081-C to MARK III-N



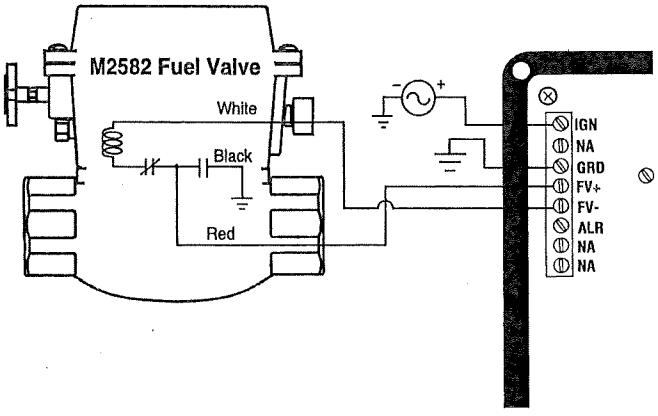
† MARK III has FET outputs rated: 0.5 A @ 250 V max.

†† Alarm Relay must be hermetically-sealed, third party certified for use in Class I, Division 2, Gps. C & D areas.

M5081-C to TTDJ-IGN-(T)



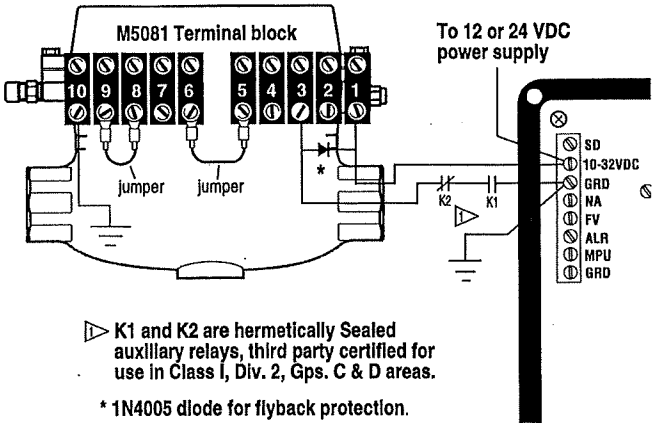
M2582-C to TTDJ-IGN-(T)



TYPICAL WIRING to SOLID-STATE TATTLETALE® Annunciators *continued*

WARNING: PERFORM THE WIRING OPERATION WITH THE POWER SOURCE "OFF" AND THE AREA MADE NON-HAZARDOUS. MAKE SURE THE VOLTAGE AND CURRENT REQUIREMENTS ARE WITHIN THE FUEL SHUT-OFF VALVE RATINGS. HARD CONDUIT WITH APPROVED SEALS IS REQUIRED BY THE NEC FOR HAZARDOUS AREA INSTALLATIONS.

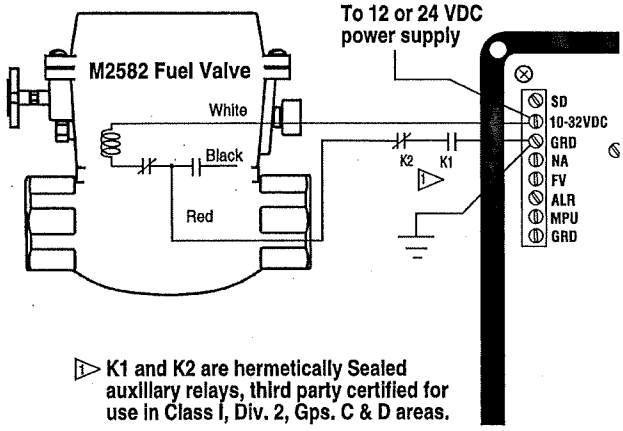
(A) M5081-B to TTDJ-DC-(T)



▷ K1 and K2 are hermetically Sealed auxiliary relays, third party certified for use in Class I, Div. 2, Gps. C & D areas.

* 1N4005 diode for flyback protection.

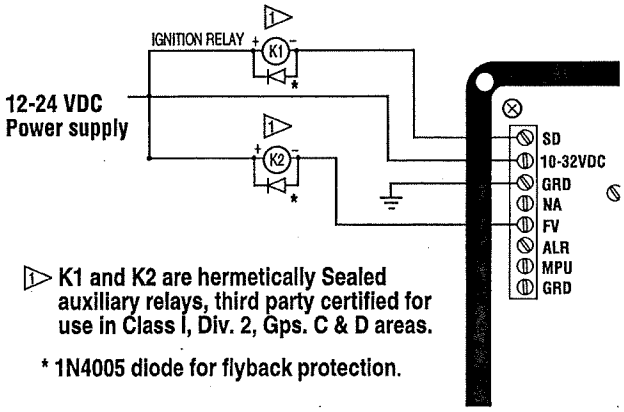
(B) M2582-B to TTDJ-DC-(T)



▷ K1 and K2 are hermetically Sealed auxiliary relays, third party certified for use in Class I, Div. 2, Gps. C & D areas.

TTDJ-DC-(T) to Relays

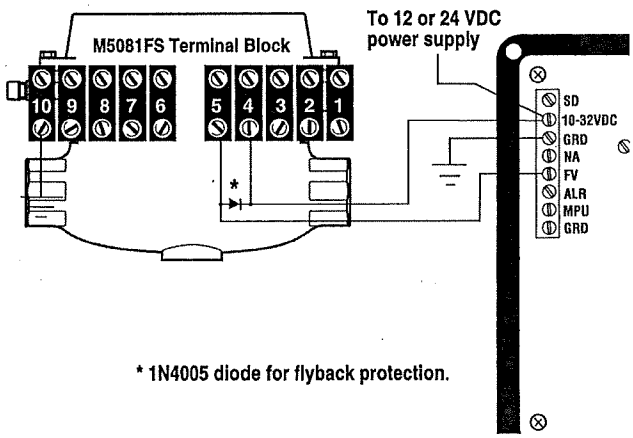
Connections Shown for Use with Diagrams (A), (B), (C), and (D) on this page.



▷ K1 and K2 are hermetically Sealed auxiliary relays, third party certified for use in Class I, Div. 2, Gps. C & D areas.

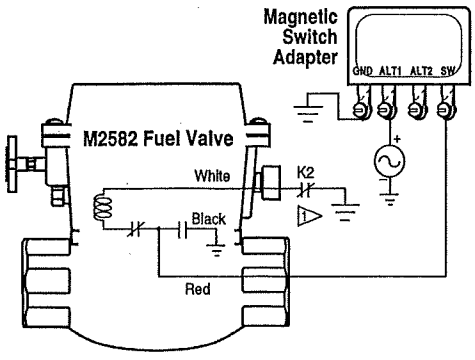
* 1N4005 diode for flyback protection.

M5081FS to TTDJ-DC-(T)



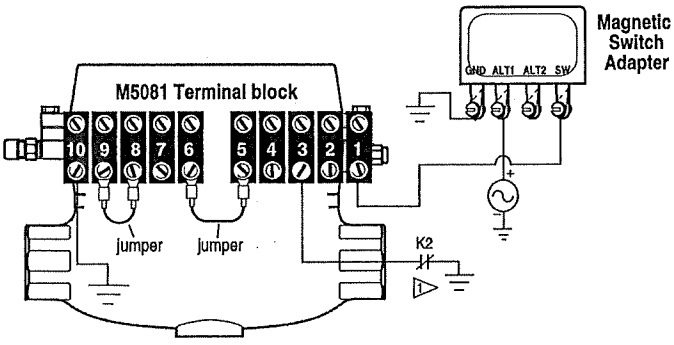
* 1N4005 diode for flyback protection.

(C) M2582-C w/Magnetic Switch Adaptor to CD Ignition



▷ K2 is hermetically sealed auxiliary relay, third party certified for use in Class I, Div. 2, Gps. C & D areas.

(D) M5081-C w/Magnetic Switch Adaptor to CD Ignition



▷ K2 is hermetically sealed auxiliary relay, third party certified for use in Class I, Div. 2, Gps. C & D areas.

SPECIFICATIONS

Valve Body: Sandcast aluminum, painted red (corrosion resistance);
Optional cast steel available for M5081 and M5081FS models only.

Valve Seat: Buna-N

Maximum Valve Inlet Pressure:
- M2582/M2582-P: *80 psi (552 kPa) [5.52 bar]*
- M5081/M5081FS/ M5180-P: *100 psi (689 kPa) [6.89]*

Maximum Control Pressure (Pneumatic Models):
- M2582-P: *75 psi (517 kPa) [5.17 bar]*
- M5180-P: *80 psi (552 kPa) [5.52 bar]*

Snap-switch: M2582: *One SPDT, 5 A @ 480 VAC*
M5081, and M5081FS: *Two SPDT, 5 A @ 480 VAC*

Wiring: M2582: *Wire leads;* M5081, and M5081FS: *Terminal blocks*
***NOTE:** All aluminum versions of the M5081 Series Fuel Valve carry Canadian Registartion Number OC1476.2.*

Coil Rating: Intermittent duty; coil type must match power source;
- CD ignition coil resistance: *72 Ω*
  CD ignition primary voltage: *1.38 to 3.8 A*
- M5081FS: Energized to Run (continuous-duty coil) coil resistance:
  12 V model: *33 Ω*;
  24 V model: *136 Ω*
- Magneto ignition coil resistance: *0.5 Ω*
  Magneto primary voltage: *1 to 5 A*
- Battery coil resistance : *7 Ω*
  12 or 24 VDC: *1.2 to 2.4 A*

Laboratory Approval: CSA listed for Class I, Groups C and D Hazardous Locations. 5 amps maximum; intermittent duty; models M5081 and M5081-CD engine ignition powered, and model M5081-B, 12 or 24 VAC or VDC; switch contacts rated 5 A @ 480 VAC maximum. Maximum pressure 100 psi (689 kPa) [6.89 bar].

SERVICE PARTS	M2582	M5081	M5081FS	M2582-P	M5180-P
Coil Assembly					
Battery	55000128	55000126	----------	----------	----------
CD Ignition	55000129	55000127	----------	----------	----------
Magneto Ignition	55000094	55000080	----------	----------	----------
M5081FS Coil Assembly					
12 VDC	----------	----------	55000158	----------	----------
24 VDC	----------	----------	55000159	----------	----------
Latch Block Assembly					
Latch block assembly	55000095	55000074	----------	----------	----------
Latch block switch and coil assembly	----------	----------	----------	----------	----------
Latch block switch and mounting bracket assembly	----------	55000118	55000196	----------	----------
Handle and Latch Kit					
Handle and latch kit	----------	55000102	55000102	5500148	55000154
Handle kit	55000096	----------	----------	----------	----------
Manual Disconnect Assembly	55000097	55000137	----------	----------	----------
Snap Switch Assembly	55000098	55000072	55000160	----------	----------
Close/Open Indicator Assembly	----------	55000138	55000138	----------	----------
Stem and Seat Kit	55000093	55000075	55000135	55000147	55000135
Top Works Complete Valve Less Body and Vent	55000146	55000131	55000161	55000150	55000155
Vent Bushing Assembly	55000143	55000132	55000132	55000143	55000132
Diaphragm Assembly	----------	----------	----------	55000184	55000153
Pilot Diaphragm	----------	----------	----------	00007908	55050420
Diode Package for Dual Magneto Ignitions	----------	65010065	----------	----------	----------
Magnetic Switch Adapter for CD Ignitions					
Single/Dual ign. – negative ground up to 240 VDC	65700053	65700053	----------	----------	----------
Single/Dual ign. – positive ground up to 450 VDC	65700054	65700054	----------	----------	----------
Single/Dual ign. – negative ground up to 450 VDC	65700055	65700055	----------	----------	----------

Warranty

A two-year warranty on materials and workmanship is given with this FWMurphy product.
A copy of the warranty may be viewed or printed by going to www.fwmurphy.com/warranty.asp.

murphy®
FWMurphy
P.O. Box 470248
Tulsa, Oklahoma 74147 USA
(918) 317-4100
fax (918) 317-4266
e-mail sales@fwmurphy.com
www.fwmurphy.com

CONTROL SYSTEMS & SERVICES DIVISION
P.O. Box 1819; Rosenberg, Texas 77471; USA
(281) 633-4500 fax (281) 633-4588
e-mail sales@fwmurphy.com

MURPHY DE MEXICO, S.A. DE C.V.
Blvd. Antonio Rocha Cordero 300, Fracción del Aguaje
San Luis Potosí, S.L.P.; México 78384
+52-444-8206264 fax +52-444-8206336
Villahermosa Office +52-993-3162117
e-mail ventas@murphymex.com.mx
www.murphymex.com.mx

FRANK W. MURPHY, LTD.
Church Rd.; Laverstock, Salisbury SP1 1QZ; U.K.
+44 1722 410055 fax +44 1722 410088
e-mail sales@fwmurphy.co.uk
www.fwmurphy.co.uk

MURPHY SWITCH OF CALIFORNIA
41343 12th Street West
Palmdale, California 93551-1442; USA
(661) 272-4700 fax (661) 947-7570
e-mail sales@murphyswitch.com
www.murphyswitch.com

MACQUARRIE CORPORATION
1620 Hume Highway
Campbellfield, Vic 3061; Australia
+61 3 9358-5555 fax +61 3 9358-5558
e-mail murphy@macquarrie.com.au

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VS-7037N
Revised 11-03
Section 20
(00-02-0185)

Shock/Vibration Control Switches Installation Instructions

Models: VS2, VS2C, VS2EX, VS2EXR, VS2EXRB and VS94

MURPHY

Please read the following instructions before installing. A visual inspection of this product for damage during shipping is recommended before mounting. It is your responsibility to have a qualified person install the unit, and make sure installation conforms with NEC and local codes.

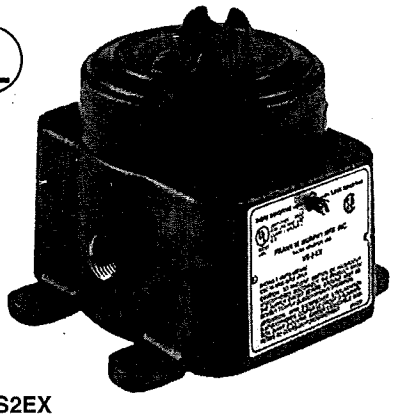
GENERAL INFORMATION

WARNING

BEFORE BEGINNING INSTALLATION OF THIS MURPHY PRODUCT

- ✔ **Disconnect all electrical power to the machine.**
- ✔ **Make sure the machine cannot operate during installation.**
- ✔ **Follow all safety warnings of the machine manufacturer.**
- ✔ **Read and follow all installation instructions.**

CSA® UL® LISTED*



Model VS2EX

Description

The Murphy shock and vibration switches are available in a variety of models for applications on machinery or equipment where excessive vibration or shock can damage the equipment or otherwise poses a threat to safe operation. A set of contacts is held in a latched position through a mechanical latch and magnet mechanism. As the level of vibration or shock increases an inertia mass exerts force against the latch arm and forces it away from the magnetic latch causing the latch arm to operate the contacts. Sensitivity is obtained by adjusting the amount of the air gap between the magnet and the latch arm plate.

Applications include all types of rotating or reciprocating machinery such as cooling fans, engines, pumps, compressors, pump jacks, etc.

Models

VS2: Base mount; non hazardous locations.

VS2C: C-clamp mount; non hazardous locations.

VS2EX: Explosion-proof; Class I, Div. 1, Groups C and D*

VS2EXR: Explosion-proof with remote reset.

VS2EXRB: Explosion-proof; Class I, Div. 1, Group B*; with remote reset.

VS94: Base mount; non hazardous locations, NEMA 4X/IP66.

Remote Reset Option (VS2EXR, VS2EXRB and VS94 only)

Includes built-in electric solenoid which allows reset of tripped unit from a remote location. Standard on VS2EXR and VS2EXRB. Optional on VS94 (options listed below).

-R15: Remote reset for 115 VAC

-R24: Remote reset for 24 VDC

Time Delay Option (VS94 only)

Overrides trip operation on start-up. For VS94 series models, the delay time is field-adjustable from 5 seconds up to 6-1/2 minutes with a 20-turn potentiometer (15 seconds per turn approximately). Options listed below:

-T15: Time delay for 115 VAC

-T24: Time delay for 24 VDC

Space Heater Options (VS94 only)

This optional space heater board prevents moisture from condensing inside the VS94 Series case. Options listed below:

-H15: Space heater for 115 VAC

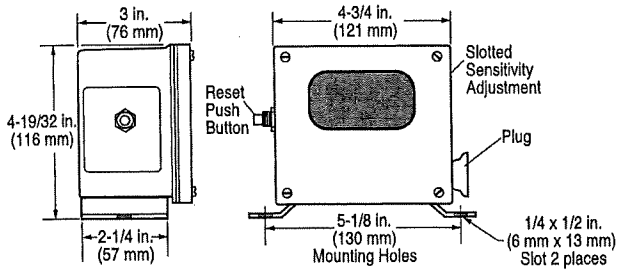
-H24: Space heater for 24 VDC

Warranty

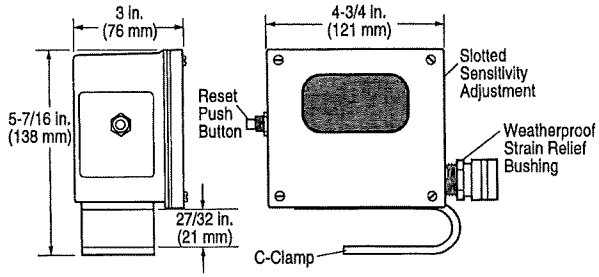
A limited warranty on materials and workmanship is given with this FW Murphy product. A copy of the warranty may be viewed or printed by going to www.fwmurphy.com/support/warranty.htm

DIMENSIONS

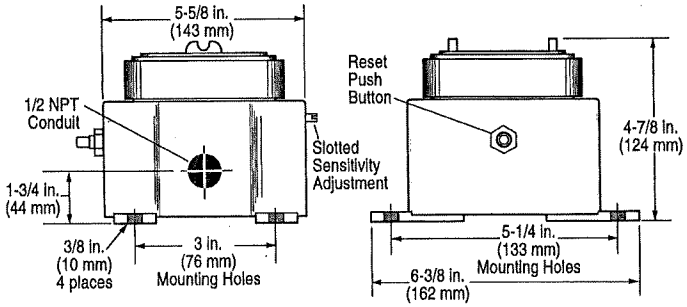
VS2



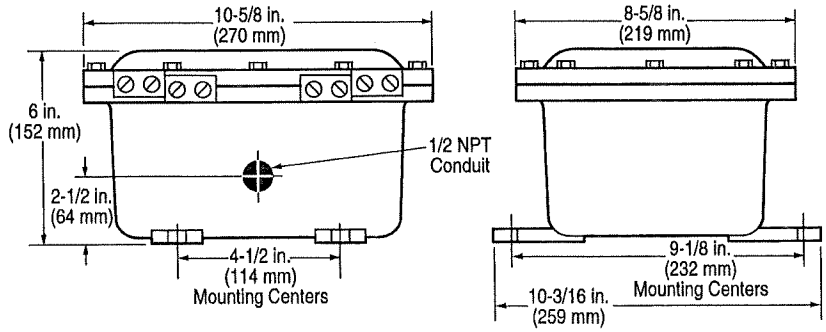
VS2C



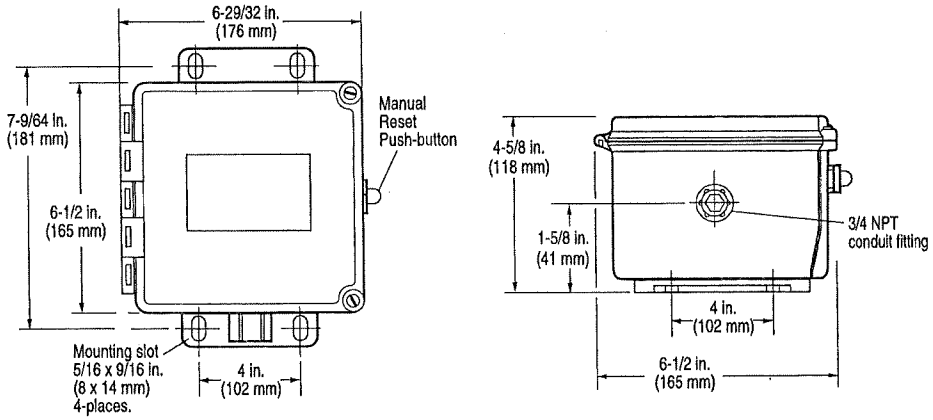
VS2EX and VS2EXR



VS2EXRB



VS94



SPECIFICATIONS

VS2 and VS2C

- **Case:** Weatherproof (equal to NEMA 3R) suitable for non-hazardous areas.
  VS2: *Base mount*
  VS2C: *C-clamp mount. Includes 45 feet (13.7 meters), 2-conductor 16 AWG, 30 strands/0.25 mm strand dia. (1.5 mm²) cable, and five cable hold down clamps.*
- **Contacts:** SPDT double make leaf contacts, 5A @ 480 VAC.
- **Range adjustment:** 0 - 7 G's; 0 - 100 Hz /0.100 in. displacement.

VS2EX

- **Case:** Explosion-proof and weatherproof aluminum alloy housing; meets NEMA 7/IP50 specifications; Class I, Division 1, Groups C & D; UL and CSA listed.*
  VS2EX: *base mount.*
- **Snap-switches:** 2-SPDT snap-switches; 5A @ 480 VAC;* 2A resistive, 1A inductive, up to 30 VDC.
- **Range adjustment:** 0 - 7 G's; 0 - 100 Hz /0.100 in. displacement.
- **Normal Operating Temperature:** -40 to 140°F (-40 to 60°C).

VS2EXR

- **Case:** Same as VS2EX.
- **Snap-switch:** 1-SPDT snap-switch and reset coil; 5A @ 480 VAC;* 2A resistive, 1A inductive, up to 30 VDC.
- **Remote Reset (optional):**

Option	*Operating Current*
-R15:	*350 mA @ 115 VAC*
-R24:	*350 mA @ 24 VDC*

- **Range adjustment:** 0 - 7 G's; 0 - 100 Hz /0.100 in. displacement.
- **Normal Operating Temperature:** -40 to 140°F (-40 to 60°C).

VS2EXRB

- **Case:** Explosion-proof aluminum alloy housing; rated Class I, Division 1, Group B hazardous areas.
- **Snap-switch:** 1-SPDT snap-switch with reset coil (option available for additional SPDT switch); 5A @ 480 VAC; 2A resistive, 1A inductive, up to 30 VDC.
- **Remote Reset:(optional):**

Option	*Operating Current*
-R15:	*350 mA @ 115 VAC*
-R24:	*350 mA @ 24 VDC*

- **Range adjustment:** 0 - 7 G's; 0 - 100 Hz /0.100 in. displacement.

VS94

- **Case:** Polyester fiberglass reinforced; NEMA type 4 and 4X; IP66; CSA types 4 and 12.
- **Conduit Fitting:** 3/4 NPT conduit fitting connection.
- **Normal Operating Ambient Temperature:** 0 to 140°F (-18 to 60°C).
- **Snap-switches:** 2-SPDT snap acting switches; 5A @ 480 VAC; 2A resistive, 1A inductive, up to 30 VDC.
- **Range adjustment:** 0 - 7 G's; 0 - 100 Hz /0.100 in. displacement.
- **Heater (optional):**

Option	*Operating Current*
H15	*.023 A @ 115 VAC*
H24	*.12 A @ 24 VDC*

- **Remote Reset (optional):**

Option	*Operating Current*
R15	*.17 A @ 115 VAC*
R24	*.36 A @ 24 VDC*

- **Time Delay (optional):**

Option	*Operating Current*	*Standby Current*
T15	*.360 A @ 115 VAC*	*.01 A @ 115 VAC*
T24	*1.15 A @ 24 VDC*	*.01 A @ 24 VDC*

- **Time Delay/Remote Reset:** Adjustable 20-turn potentiometer from 5 seconds to 6-1/2 minutes (15 seconds per turn approximately).

*CSA and UL listed with 480 VAC rating.

INSTALLATION

WARNING: STOP THE MACHINE AND DISCONNECT ALL ELECTRICAL POWER BEFORE BEGINNING INSTALLATION.

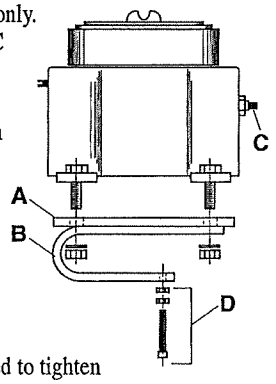
The VS2 and VS94 series shock switches are sensitive to shock and vibration in all three planes of motion - up/down, front/back and side/side. Front/back is the most sensitive (The reset pushbutton is located on the "front" of the unit). For maximum sensitivity mount the unit so that the front faces into the direction of rotation of the machine. (See Dimensions on page 2 for sensitivity adjustment location).

The VS2 and VS94 Series must be firmly attached/mounted to the machine so that all mounting surfaces are in rigid contact with the mounting surface of the machine. For best results, mount the instrument in-line with the direction of rotating shafts and/or near bearings. In other words, the reset push button should be mounted pointing into the direction of shaft rotation (see page 5). It may be necessary to provide a mounting plate or bracket to attach the VS2 and VS94 Series to the machine. The mounting bracket should be thick enough to prevent induced acceleration/vibration upon the VS2 or VS94 Series. Typically 1/2 in. (13mm) thick plate is sufficient. See illustrations on page 5 for typical mounting locations.

CAUTION: A dust boot is provided on the reset pushbutton for all series to prevent moisture or dust intrusion. The sensitivity adjustment for model VS2EX is not sealed; therefore, mounting orientation should be on a horizontal plane or with the sensitivity adjustment pointing down. Sensitivity adjustment for model VS2 is covered by a plug. The plug must be in place and tight to prevent moisture or dust intrusion.

C-Clamp Installation (VS2C model only)

A C-Clamp is supplied with the VS2C model only. The C-Clamp is shipped installed on the VS2C but must be installed on the VS2EX and VS2EXR switches.



1. The C-Clamp **(B)** will already be installed on a 1/4 in. (6 mm) thick steel mounting plate **(A)**. Bolt the VS2 switch to the mounting plate as illustrated — with four 5/16 in. bolts, nuts, and washers.
2. The mounting location should provide convenient access to the TATTLETALE® push button **(C)**.
3. The hardened set screw and nuts **(D)** are used to tighten the switch to an I-Beam or cross member such as a Sampson post of an oilwell pumpjack.

Continued on next page.

All Models

WARNING: STOP THE MACHINE AND DISCONNECT ALL ELECTRICAL POWER BEFORE BEGINNING INSTALLATION.

1. Firmly secure the unit to the equipment using the base foot mount or C-Clamp if applicable. See *C-Clamp Installation* page 3.

   For oilwell pumpjacks attach the VS2 and VS94 Series to the Sampson post or walking beam. See *Typical Mounting Locations* page 5.

2. Make the necessary electrical connections to the vibration switch. See *Internal Switches,* page 6 for electrical terminal locations and page 7 for typical wiring diagrams. **DO NOT EXCEED VOLTAGE OR CURRENT RATINGS OF THE CONTACTS.** Follow appropriate electrical codes/methods when making electrical connections. Be sure that the run of electrical cable is secured to the machine and is well insulated from electrical shorting. Use of conduit is recommended.

NOTE: If the electrical cable crosses a pivot point such as at the pivot of the walking beam, be sure to allow enough slack in the cable so that no stress is placed on the cable when the beam moves.

If conduit is not used for the entire length of wiring, conduit should be used from the electrical supply box to a height above ground level that prevents damage to the exposed cable from the elements, rodents, etc. or as otherwise required by applicable electrical codes. If conduit is not attached directly to the VS2 and VS94 Series switch, use a strain relief bushing and a weatherproof cap on the exposed end of the conduit. A "drip loop" should be provided in the cable to prevent moisture from draining down the cable into the conduit should the weathercap fail.

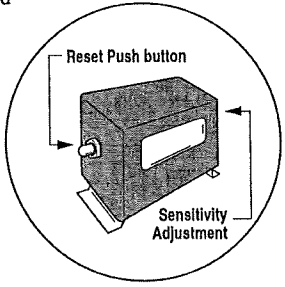
Sensitivity Adjustment

WARNING: REMOVE ALL POWER BEFORE OPENING THE ENCLOSURE. IT IS YOUR RESPONSIBILITY TO HAVE A QUALIFIED PERSON PERFORM ADJUSTMENTS, AND MAKE SURE IT CONFORMS WITH NEC AND LOCAL CODES. DO NOT ADJUST SENSITIVITY WHILE THE MACHINE IS RUNNING. STAND CLEAR OF THE MACHINE AT ALL TIMES WHEN IT IS OPERATING.

All models of the VS2 and VS94 Series cover a wide range of sensitivity. Each model is adjusted to the specific piece of machinery on which it is installed. After the switch has been installed in a satisfactory location (see page 5) the sensitivity adjustment will be increased or decreased so that the switch does not trip during start-up or under normal operating conditions. This is typically done as follows:

1. **REPLACE ALL COVERS, LIDS, AND ELECTRICAL ENCLOSURES.**
2. Press the reset push button to engage the magnetic latch. To be sure the magnetic latch has engaged, observe latch through the window on the VS2 and VS2C (see DETAIL "A"). On the VS2EX, VS94 series the reset button will remain depressed meaning the magnetic latch has engaged.
3. Start the machine.
4. If the instrument trips on start-up, allow the machine to stop. Turn the sensitivity adjustment 1/4 turn clockwise, (adjustment for VS94 and VS2EXRB models is located within the box, see DETAIL "B").

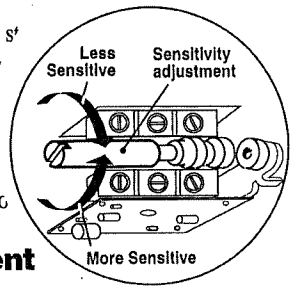
DETAIL "A"



WARNING: MAKE THE AREA NON-HAZARDOUS BEFORE OPENING THE EXPLOSION-PROOF (-EX) ENCLOSURES.

Depress the reset button and restart the machine. Repeat this process until the unit does not trip on start-up.

DETAIL "B"



5. If the instrument does NOT trip on start-up, s sensitivity adjustment 1/4 turn counter-cl up/stop process until the instrument trips or adjustment 1/4 turn clockwise (less sensit verify that the instrument will not trip on start
6. Verify that the unit will trip when abnormal sho

VS94 Time Delay Adjustment

1. Apply power to the time delay circuit. (see page 7 for time delay circuit). The time delay function will be initiated.
2. Time the length of the delay with a watch. Let time delay expire. After it expires, the override circuit will de-energize the solenoid, allowing the latch arm to trip. A clicking noise is heard.

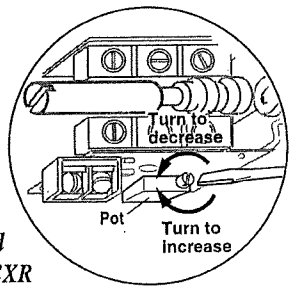
WARNING: REMOVE ALL POWER BEFORE OPENING ACCESS DOOR. IT IS YOUR RESPONSIBILITY TO HAVE A QUALIFIED PERSON ADJUST THE UNIT, AND MAKE SURE IT CONFORMS WITH NEC AND LOCAL CODES.

3. **TURN THE POWER OFF TO RESET THE TIME DELAY CIRCUIT.**

NOTE: Allow 30 seconds bleed-time between turning the power "OFF" and "ON".

4. Locate the time adjustment pot (DETAIL "C"). The time is factory-set at the lowest setting (5 seconds approximately). To increase time, rotate the 20-turn pot clockwise as needed (15 seconds per turn approximately).

DETAIL "C"



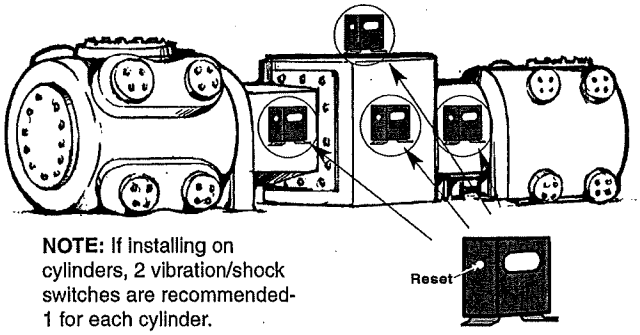
5. Repeat the above steps as necessary to obtain desired time delay.

NOTE: An external time delay can be used with the remote reset feature of the VS2EXR series to provide a remote reset and override of the trip operation on start-up. Time delay must automatically disconnect after equipment start-up.

TYPICAL MOUNTING LOCATIONS

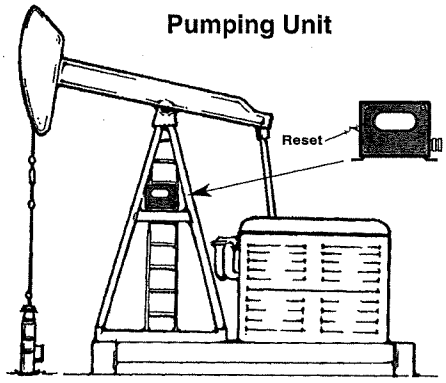
NOTE: These are typical mounting locations for best operation. Other mountings are possible. See *Installation* section on page 3.

2-Throw Balance-Opposed Compressor

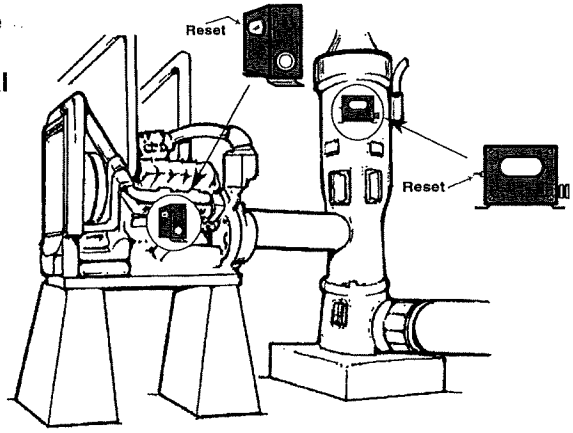


NOTE: If installing on cylinders, 2 vibration/shock switches are recommended- 1 for each cylinder.

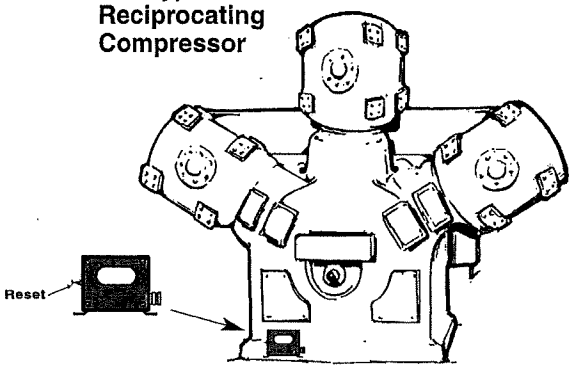
Pumping Unit



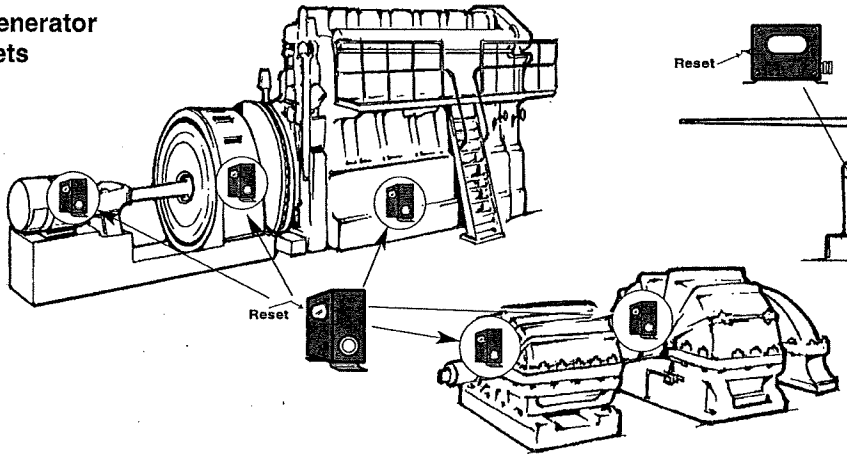
Engine and Vertical Shaft Pump



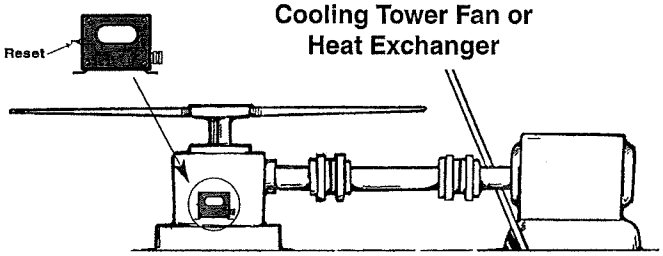
"Y" Type Reciprocating Compressor



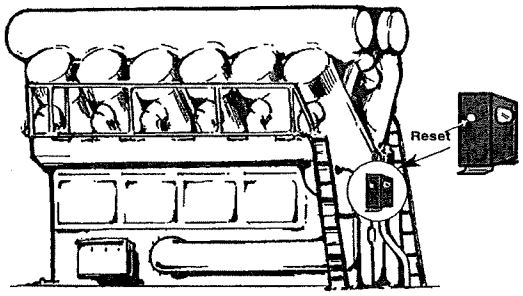
Generator Sets



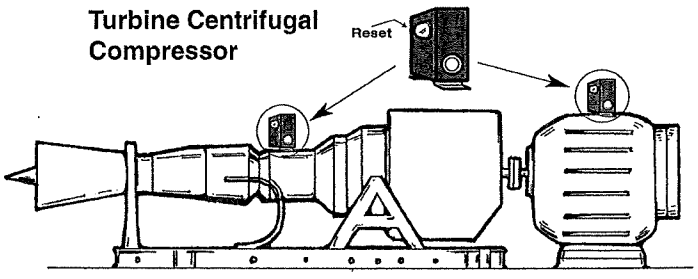
Cooling Tower Fan or Heat Exchanger



Engine Compressor

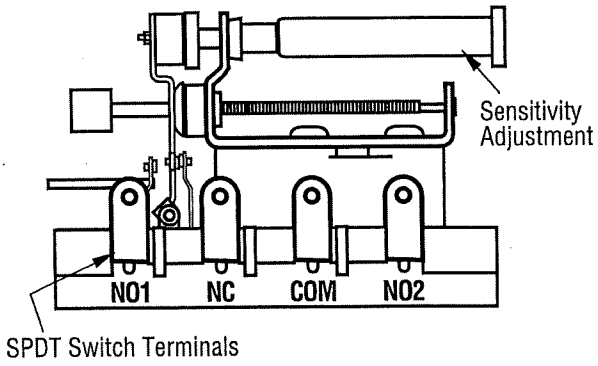


Turbine Centrifugal Compressor

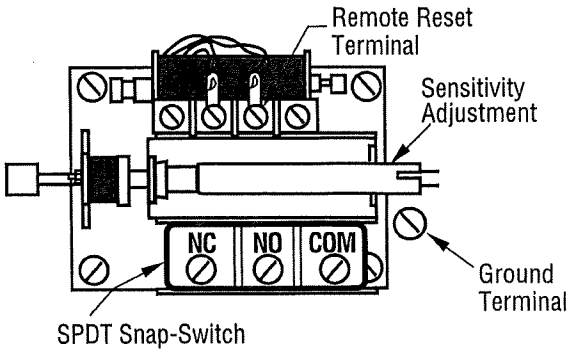


INTERNAL SWITCHES

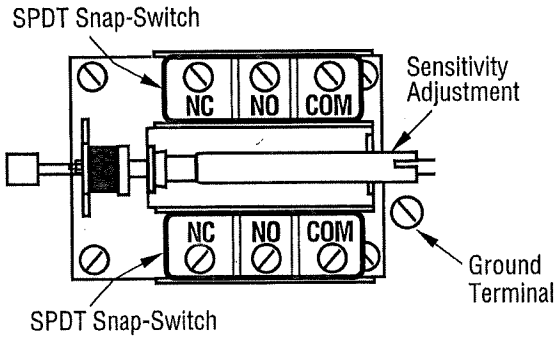
VS2 and VS2C



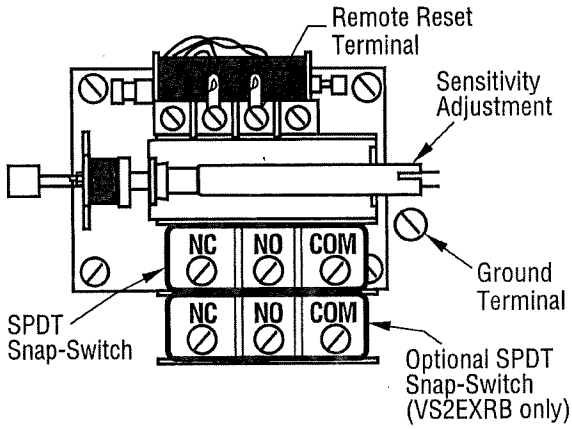
VS2EXR



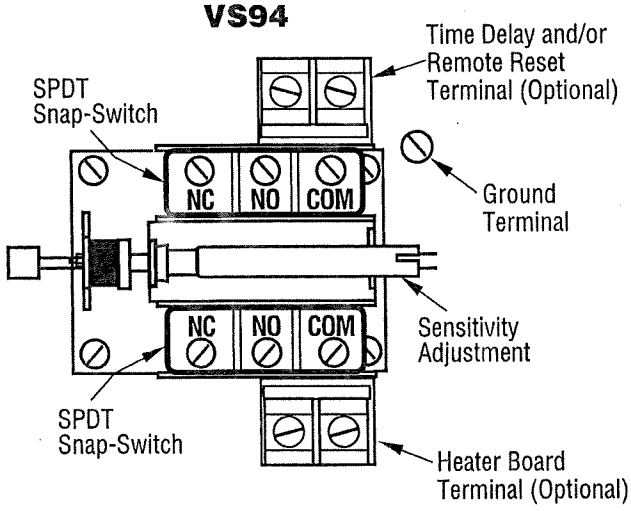
VS2EX



VS2EXB and VS2EXRB



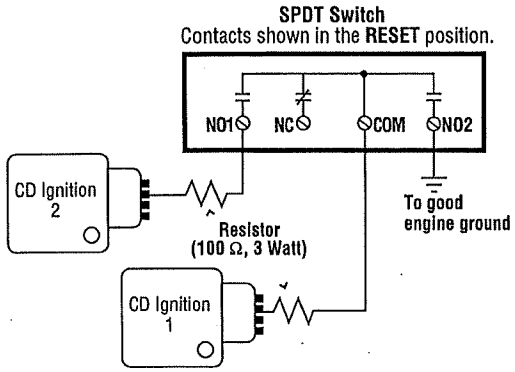
VS94



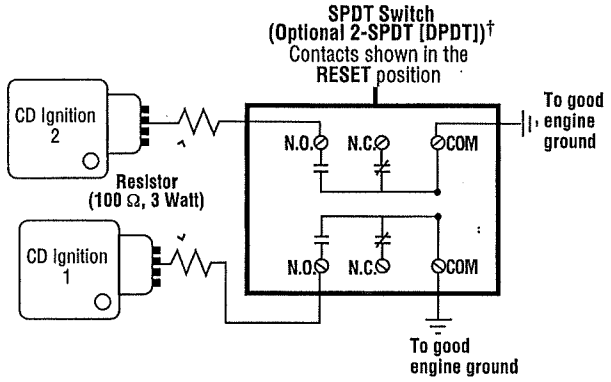
ELECTRICAL

WARNING: REMOVE POWER BEFORE OPENING THE UNIT (ACCESS DOOR). STOP THE MACHINE AND DISCONNECT ALL ELECTRICAL POWER BEFORE BEGINNING THE WIRING OPERATION. IT IS YOUR RESPONSIBILITY TO HAVE A QUALIFIED PERSON INSTALL AND WIRE THE UNIT, AND MAKE SURE IT CONFORMS WITH NEC AND APPLICABLE CODES.

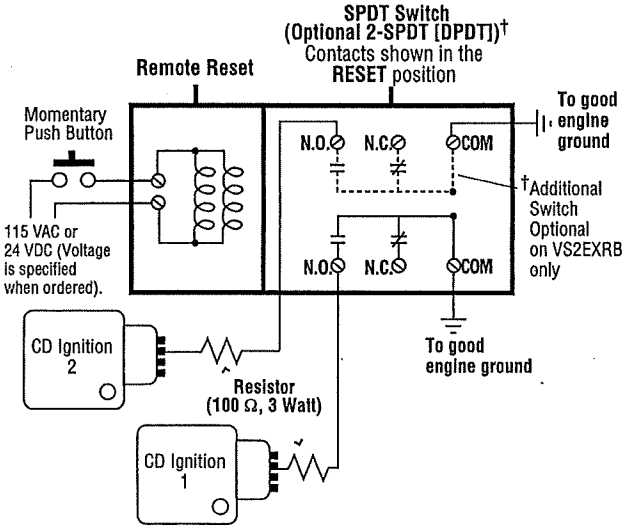
VS2 and VS2C
Typical Wiring Diagram for Single or Dual CD Ignition



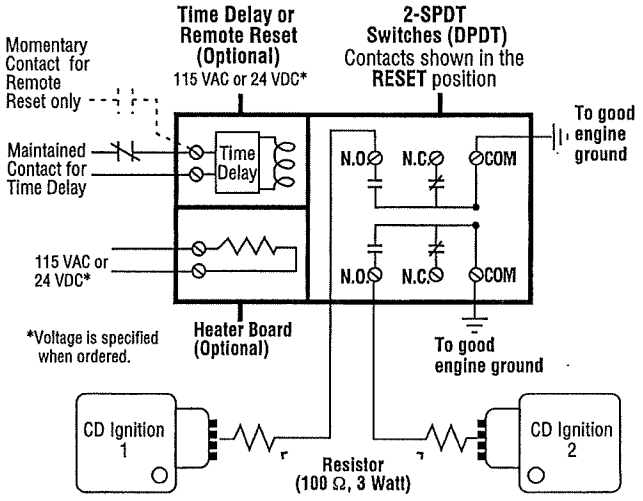
VS2EX
Typical Wiring Diagram for Single or Dual CD Ignitions



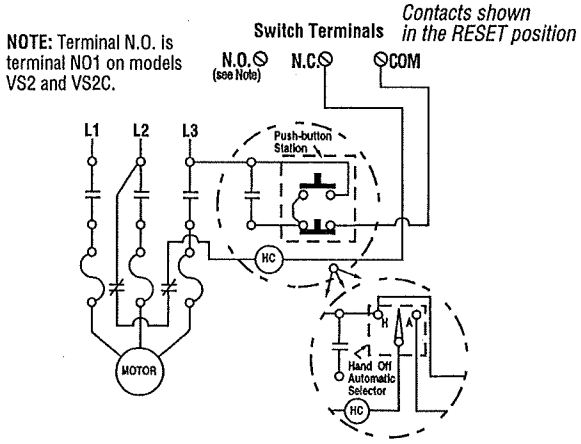
VS2EXR and VS2EXRB
Typical Wiring Diagram for Single or Dual CD Ignitions



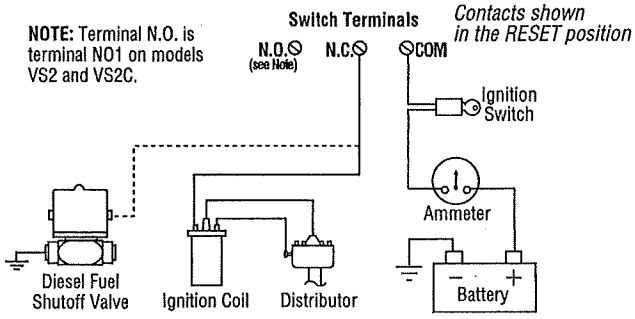
VS94
Typical Wiring Diagram for Single or Dual CD Ignitions



VS2, VS2C, VS2EX, VS2EXR, VS2EXRB and VS94
Typical Wiring Diagram for Electric Motors



VS2, VS2C, VS2EX, VS2EXR, VS2EXRB and VS94
Typical Wiring Diagram for Distributor Ignition or Diesel



SERVICE PARTS

PART NO.	DESCRIPTION
VS2	
20000030	Movement assembly
20000031	Glass and gasket assembly
20000032	Reset push button assembly
VS2C	
20000030	Movement assembly
20000031	Glass and gasket assembly
20000032	Reset push button assembly
20050021	Mounting clamp
20000185	VS2C 5-clamp hardware package assembly.
20050465	2-Conductor electrical cable, 45 feet (13.7 meters)
VS2EX	
20010091	Movement assembly
20050087	Cover
00000309	Cover gasket
20010090	Snap-switch and insulator kit (1 switch per kit) **prior to September 1, 1995.***
20000288	**Snap-switch and insulator kit (1 switch per kit) for models manufactured on September 1, 1995 or later.***
20000289	C-clamp conversion mounting kit
VS2EXR	
20000262	Movement assembly
20050087	Cover
00000309	Cover gasket
20010090	Snap-switch and insulator kit (1 switch per kit) **prior to September 1, 1995.***
20000288	**Snap-switch and insulator kit (1 switch per kit) for models manufactured on September 1, 1995 or later.***
20000049	Reset solenoid assembly (115 VAC)
20000234	Reset solenoid assembly (24 VDC)
20000289	C-clamp conversion mounting kit

PART NO.	DESCRIPTION
VS2EXRB	
20010090	Snap-switch and insulator kit (1 switch per kit) **prior to September 1, 1995.***
20000288	**Snap-switch and insulator kit (1 switch per kit) for models manufactured on September 1, 1995 or later.***
20000057	*Inside* snap-switch and insulator kit (1 switch per kit) for model VS2EXRB-D **prior to September 1, 1995.***
20000058	*Outside* snap-switch and insulator kit (1 switch per kit) for model VS2EXRB-D **prior to September 1, 1995.***
20000287	***Inside* snap-switch and insulator kit (1 switch per kit) for model VS2EXRB-D manufactured on September 1, 1995 or later.***
20000290	***Outside* snap-switch and insulator kit (1 switch per kit) for model VS2EXRB-D manufactured on September 1, 1995 or later.***
20050077	Adjustment shaft
20000262	Movement assembly
20000049	Reset solenoid assembly (115 VAC)
20000234	Reset solenoid assembly (24 VDC)
VS94 Series	
25050506	Dust boot
00000232	Conduit fitting
20010090	Snap-switch and insulator kit (1 switch per assembly) **prior to September 1, 1995.****
20000288	**Snap-switch and insulator kit (1 switch per assembly) for models manufactured on September 1, 1995 or later.*****

* If no date code is found, refer to the old switch. Models with date 0895 and before use old switch. Dated 0995 after, use straight snap-switch arm, no rollers.

** Models dated Q1 thru Q8 (formed snap-switch arm and rollers).

***Models date coded Q9 thru Q12 and R1 thru R12 (straight snap-switch arm, no rollers).

MURPHY

FW Murphy
P.O. Box 470248
Tulsa, Oklahoma 74147 USA
+1 918 317 4100
fax +1 918 317 4266
e-mail sales@fwmurphy.com
www.fwmurphy.com

CONTROL SYSTEMS & SERVICES DIVISION
P.O. Box 1819; Rosenberg, Texas 77471; USA
+1 281 633 4500 **fax** +1 281 633 4588
e-mail sales@fwmurphy.com

MURPHY DE MEXICO, S.A. DE C.V.
Blvd. Antonio Rocha Cordero 300, Fracción del Aguaje
San Luis Potosí, S.L.P.; México 78384
+52 444 8206264 **fax** +52 444 8206336
Villahermosa Office +52 993 3162117
e-mail ventas@murphymex.com.mx
www.murphymex.com.mx

FRANK W. MURPHY, LTD.
Church Rd.; Laverstock, Salisbury SP1 1QZ; U.K.
+44 1722 410055 **fax** +44 1722 410088
e-mail sales@fwmurphy.co.uk
www.fwmurphy.co.uk

MURPHY SWITCH OF CALIFORNIA
41343 12th Street West
Palmdale, California 93551-1442; USA
+1 661 272 4700 **fax** +1 661 947 7570
e-mail sales@murphyswitch.com
www.murphyswitch.com

MACQUARRIE CORPORATION
1620 Hume Highway
Campbellfield, Vic 3061; Australia
+61 3 9358 5555 **fax** +61 3 9358 5558
e-mail murphy@macquarrie.com.au

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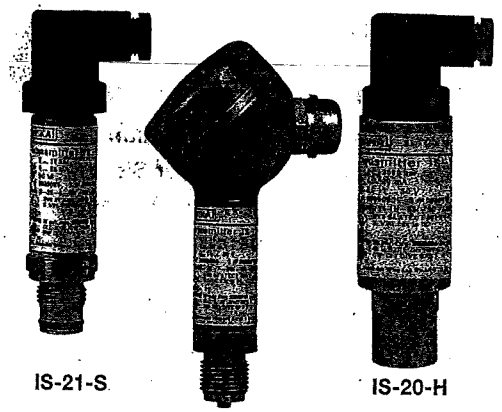
Operating instructions
Betriebsanleitung
Mode d'emploi

IS-20-S, IS-21-S
IS-20-F, IS-21-F
IS-20-H

Pressure transmitter /
Druckmessumformer /
Transmetteur de pression



IS-21-S

IS-20-F

IS-20-H

2132926.02 GB/D/F 01/2006

WIKA Alexander Wiegand GmbH & Co. KG
Alexander-Wiegand-Straße 30
63911 Klingenberg/Germany
Phone (+49) 93 72/132-295
Fax (+49) 93 72/132-706
E-Mail support-tronic@wika.de
www.wika.de

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Contents / Inhalt / Contenu GB D F

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www.wika.de

Es gelten unsere aktuellen Verkaufs- und Lieferbedingungen siehe unter
www.wika.de

Toute commande est assujettie à nos conditions de ventes et de fournitures dans leur dernière version en vigueur, voir sous
www.wika.de

2132926.02. GB/D/F 01/2006

1. Important details for your information

Read these operating instructions before installing and starting the pressure transmitter. Keep the operating instructions in a place that is accessible to all users at any time.
The following installation and operating instructions have been compiled by us with great care but it is not feasible to take all possible applications into consideration. These installation and operation instructions should meet the needs of most pressure measurement applications. If questions remain regarding a specific application, you can obtain further information (data sheets, instructions, etc.) via our Internet address (www.wika.de / www.wika.com) or contact WIKA for additional technical support (see section7 „Starting, Operation"/Further information).
The product data sheet is designated as PE 81.50 / PE 81.51
WIKA pressure transmitters are carefully designed and manufactured using state-of-the-art technology. Every component undergoes strict quality inspection before assembly and each instrument is fully tested prior to shipment.

Use of the product in accordance with the intended use IS-2*-S, IS-2*-F, IS-20-H:
Use the intrinsically safe pressure transmitter for pressure measurement in hazardous areas.

Certificate **ATEX:** Pressure transmitter for operation in hazardous areas in compliance with the respective certificate (see attached EC-type examination certificate BVS 04 ATEX E 068 X).
ATEX Approval ratings: Gases and mist connection to Zone 0, Zone 1, Zone 2. Dust connection to Zone 20, Zone 21, Zone 22 (not for IS-20-H).
Mining Category M1, M2.

Certificate **FM/CSA:** Pressure transmitter for operation in hazardous areas in compliance with the respective certificate (see Control drawing No. 2323880, section 13).
FM / CSA Approval ratings: Intrinsically Safe with entity approval for Class I, II and III Division 1, Groups A, B, C, D, E, F, G and Class I, Zone 0, AEx ia IIC
Dust-ignitionproof for Class II and III, Division 1, Groups E, F, and G.
Non-incendive for Class I Division 2 Groups A, B, C and D
FM standards according to FMRC 3600, 3610, 3611, 3810 (including supplement #1), ISA-S12.0.01, IEC60529 (including amendment #1)
CSA Standard C22.2 No. 0-M1991 / 94-M1991 / 142-M1987 / 157-M1992
UL 50, Eleventh Edition / UL 508, Seventeenth Edition / UL 913, Sixth Edition

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Knowledge required: Install and start the pressure transmitter only if you are familiar with the relevant regulations and directives of your country and if you have the qualification required. You have to be acquainted with the rules and regulations on hazardous areas, measurement and control technology and electric circuits, since this pressure transmitter is „electrical equipment" as defined by EN 50178. Depending on the operating conditions of your application you have to have the corresponding knowledge, e.g. of aggressive media.

2. A quick overview for you

If you want to get a quick overview, read **Chapters 3, 5, 7 and 10.** There you will get some short safety instructions and important information on your product and its starting. **Read these chapters in any case.** Get some more detailed information on this product in Chapters 4 „Function and accessories" and 6 „Packaging". Read Chapter 8 for „Maintenance". In the case of failures please refer to Chapter 9.

3. Abbreviations, signs and symbols

Potential danger of life or of severe injuries

Potential danger of life or of severe injuries due to catapulting parts

Potential danger of burns due to hot surfaces


Notice: important information, malfunction


The product complies with the applicable European directives


Power supply


Load (e.g. display)


The product complies with the requirements of the European directive 94/9/EC (ATEX) on explosion protection

The product was tested and certified by FM Approvals. It complies with the applicable US-American standards on safety (including explosion protection).

The product was tested and certified by CSA International. It complies with the applicable Canadian and US-American standards on safety (including explosion protection).

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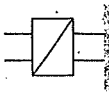

With a line transformer you realise the mandatory galvanic isolation of the voltage- and current supply between hazardous and non-hazardous areas and ensure the safety connection data.

2-wire	Two connection lines are intended for the voltage supply. The supply current is the measurement signal.
UB+/Sig+	Positive supply / measurement connection
OV/Sig-	Negative supply / measurement connection
ATEX	European guideline for explosion protection (Atmosphäre=AT, Explosion=EX)
CSA	Canadian Standard Association
EHEDG	European Hygienic Equipment Design Group
FDA	Food and Drug Administration
FM	Factory Mutual

4. Function and accessories

IS-20:	Standard pressure connection (intrinsically safe).
IS-21:	Pressure connection with flush diaphragm (intrinsically safe) for highly viscous or solids entrained media which might clog the pressure port.
IS-2✳**-S**	Pressure transmitter (intrinsically safe), version with electrical connector or flying leads.
IS-2✳**-F**	Pressure transmitter (intrinsically safe), field case version.
IS-20-**H**	Pressure transmitter (intrinsically safe), highest pressure version.

Function: With the pressure transmitter you measure the pressure of your application, which is trans-formed into an electric signal. This electric signal changes in proportion to the pressure and can be evaluated correspondingly.

Accessories: For details about the accessories, please refer to WIKA's price list, WIKA's product catalog on CD or WIKA's web site www.wika.de. Please refer to our data sheet "Pressure gauge sealing washers AC 09.08" in WIKA's product catalog Pressure and Temperature Measurement or our web site www.wika.de for details about sealing washers.

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5. For your safety

Warning

- Select the appropriate pressure transmitter with regard to scale range, performance and specific measurement conditions prior to installing and starting the instrument.
- Observe the relevant national regulations (e.g. EN 50178, NEC, CEC) and observe the applicable standards and directives for special applications (e.g. with dangerous media such as oxygen, acetylene, flammable gases or liquids and toxic gases or liquids and with refrigeration plants or compressors).

If you do not observe the appropriate regulations, serious injuries and/or damage can occur!

- **Open pressure connections only after the system is without pressure!**
- Please make sure that the pressure transmitter is only used within the overload threshold limit at all times!
- Observe the ambient and working conditions outlined in section 7 „Technical data".
- Ensure that the pressure transmitter is only operated in accordance with the provisions, i.e. as described in the following instructions.
- Do not interfere with or change the pressure transmitter in any other way than described in these operating instructions.
- Remove the pressure transmitter from service and mark it to prevent it from being used again accidentally, if it becomes damaged or unsafe for operation.
- **Take precautions with regard to remaining media in removed pressure transmitter. Remaining media in the pressure port may be hazardous or toxic!**
- Have repairs performed by the manufacturer only.
- Consider the details given in the EC-type examination certificate as well as the respective specifications for explosion hazard use for the country concerned (e.g. IEC 60079, NEC, CEC). If you do not observe these stipulations, serious injuries and/or damage can occur.

Information about material consistency against corrosion and diffusion can be found in our WIKA-Handbook, 'Pressure and Temperature Measurement'.

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Special advice for intrinsic safety

Warning

- Protect the diaphragm against any contact with abrasive substances and against pressure peaks and do not touch it with tools! If you damage the diaphragm, no intrinsic safety can be guaranteed (ATEX, FM, CSA)!
- Ensure that under hazardous dust environment the pressure transmitter is mounted in a shielded section and protect it against shocks.

Measurement of process media with higher temperatures than the media temperature ranges specified in the tables of the EC-type examination certificate under item 15.1.2 is permissible, if special cooling elements are used (not for IS-20-H).

Warning

- Observe the permissible surface temperatures applicable for this range according to the defined temperature classes.
- Observe the maximum temperature value (of the temperature range defined under item 15.1.2 in the EC-type examination certificate) at the hexagon of the tubular case.
- Ensure an unhindered air circulation at the cooling element.
- Protect the pressure transmitter against touching or affix a warning notice.
- Insulate heat sources thermally from the pressure transmitter (e.g. pipes or tanks).
- Protect the cooling element against contamination and dust deposits.

Special wiring advice

Warning

- The bayonet connector is made of light metal in material which is not permissible for group I applications (mining).
- Always connect the case to earth to protect the pressure transmitter against electromagnetic fields and electrostatic charges.
- Connect the shield to ground exclusively in safe (i.e. non-hazardous) areas in accordance with EN 60079-14. Ensure that with flying leads the shield is always connected to ground on the instrument side by the manufacturer.
- Consider both the internal capacitance and inductance.
- Consider that cables for use in zones 1 and 2 must be checked with a test voltage between conductor/earth, conductor/screen, screen/earth of more than 500V (AC).
- Cover flying leads with fine wires by an end splice (cable preparation).

Installation in / connection to zone 0 and zone 20 (zone 20 not with IS-20-H)
(In general Zone 0 is given when the pressure transmitter is surrounded by a mixture of explosive gases more than 1.000 hours per year = continuous hazard).

- For the seperation of the zones the pressure transmitter or the cable gland in the wall must have the ingress protection according to IEC 60 529 namely for zone 0: IP 67 and for zone 20: IP 6X.
- Observe the technical data for the use of the pressure transmitter in connection with aggressive / corrosive media and for the avoidance of mechanical hazards.
- Lay out the circuits according to type Ex ia.

6. Packaging

- Inspect the pressure transmitter for possible damage during transportation. Should there be any obvious damage, inform the transport company and WIKA without delay.
- Keep the packaging, as it offers optimal protection during transportation (e.g. changing installation location, shipment for repair).
- Keep the protection cap of the pressure connection thread and the diaphragm for later storage or transport.

In order to protect the diaphragm, the pressure connection of the instrument IS-21-S, -F is provided with a special protection cap.

- Remove this protection cap only just before installing the pressure transmitter in order to prevent any damage to the diaphragm.
- Mount the protection cap when removing and transporting the instrument.
- Ensure that the pressure connection thread and the connection contacts will not be damaged.

7. Starting, operation

Has everything been supplied?

Check the scope of supply

- Completely assembled pressure transmitters; with flush version IS-21-S..F including pre-assembled sealings and protection cap
- EC-type examination certificate

Required tools: wrench (flats 27), screw driver

Diaphragm test for your safety

It is necessary that before starting the pressure transmitter you test the diaphragm, as this is a **safety-relevant component.**

Warning

- Pay attention to any liquid leaking out, for this points to a diaphragm damage (not necessary for IS-20-H).
- Check the diaphragm visually for any damage.
- Use the pressure transmitter only if the diaphragm is undamaged.
- Use the pressure transmitter only if it is in a faultless condition as far as the safety-relevant features are concerned.

Installation

- Remove the protection cap only just before installation and absolutely avoid any damage to the diaphragm during installation as well.
- Ensure that the cable diameter you select fits to the cable gland of the connector. Ensure that the cable gland of the mounted connector is positioned correctly and that the sealings are available and undamaged. Tighten the threaded connection and check the correct position of the sealings in order to ensure the ingress protection.
- When mounting the instrument, ensure that the sealing faces of the instrument and the measuring point are clean and undamaged.
- Screw in or unscrew the instrument only via the flats using a suitable tool and and the prescribed torque. Do not use the case as working surface for screwing in or unscrewing the instrument.
- When screwing the transmitter in, ensure that the threads are not jammed.

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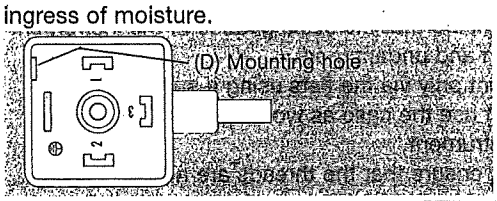
IS-20-F , IS-21-F

IS-20-S, IS-21-S

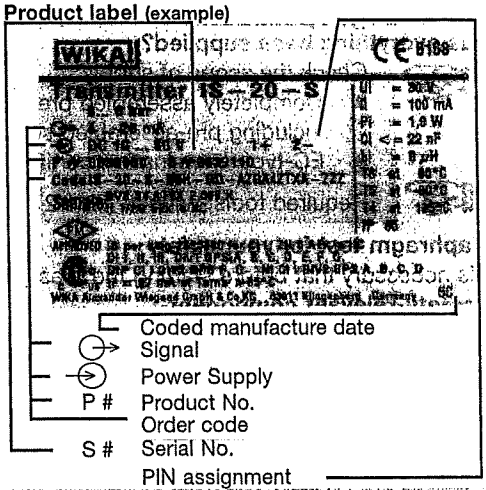
For Model IS-20-S/-F the sealing ring is available as an optional extra. For Model IS-21-S/-F the sealing ring is included in delivery.

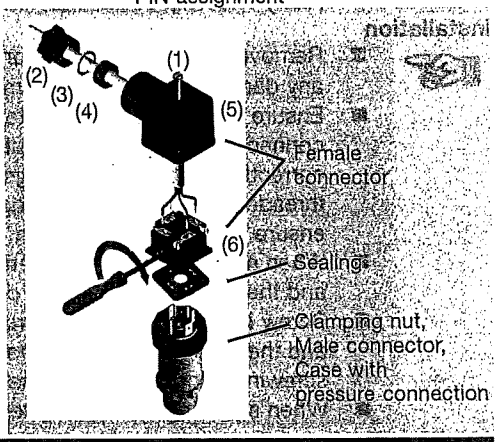
For tapped holes and welding sockets please see Technical Information IN 00.14 for download at www.wika.de -Service

Wiring: Ingress protection per IEC 60529 (The ingress protection classes specified only apply while the pressure transmitter is connected with female connectors that provide the corres-ponding ingress protection). Please make sure that the ends of cables with flying leads do not allow any ingress of moisture.



Product label (example)





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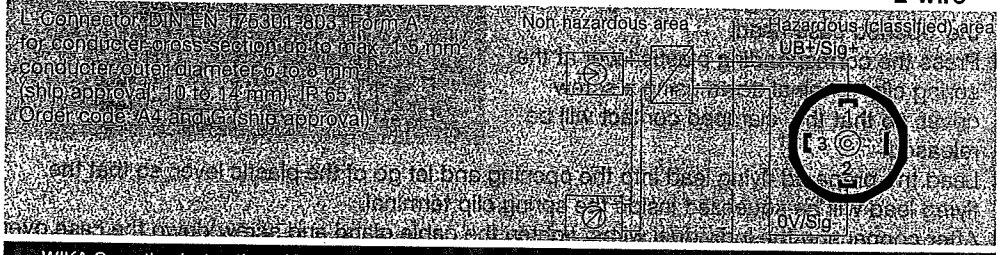
7. Starting, operation

GB

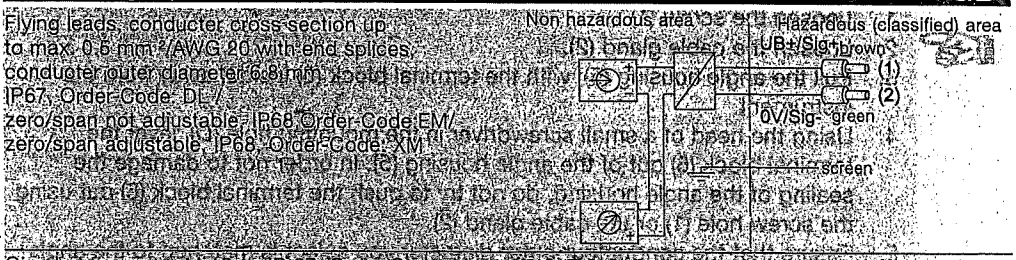
1. Loosen the screw (1).
2. Loosen the cable gland (2).
3. Pull the angle housing (5) with the terminal block (6) inside away from the instrument.
4. Using the head of a small screwdriver in the mounting hole (D), lever the terminal block (6) out of the angle housing (5). In order not to damage the sealing of the angle housing, do not try to push the terminal block (6) out using the screw hole (1) or the cable gland (2).
5. Ensure that the conductor outer diameter you select is matched to the angle housing's cable gland. Slide the cable through the cable gland nut (2), washer (3), gland seal (4) and angle housing (5).
6. Connect the lying leads to the screw terminals on the terminal block (6) in accordance with the pin assignment drawing.
7. Press the terminal block (6) back into the angle housing (5).
8. Tighten the cable gland (2) around the cable. Make sure that the sealing isn't damaged and that the cable gland and seals are assembled correctly in order to ensure ingress protection.
9. Place the flat square gasket over the connection pins on the top of the instrument housing.
10. Slide the terminal block (6) onto the connection pins.
11. Secure the angle housing (5) and terminal block (6) to the instrument with the screw (1).

Model IS-20*S, IS-21-S, IS-20-H **2-wire**

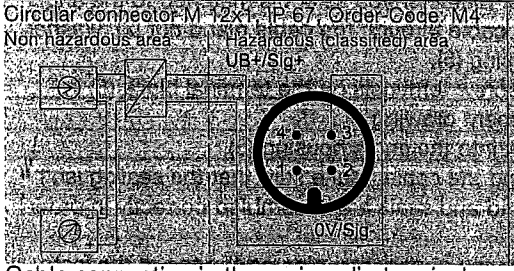


7. Starting, operation GB

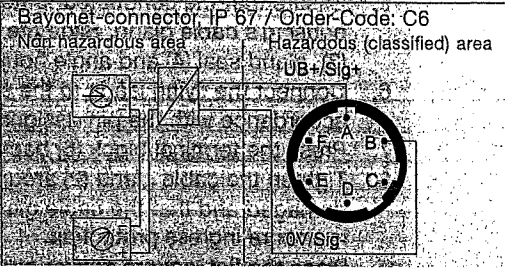
Flying leads, conductor cross-section up to max. 0.5 mm²/AWG 20 with end splices, conductor outer diameter 6.8 mm, IP67, Order-Code: DL / zero/span not adjustable, IP68 Order-Code: EM/ zero/span adjustable, IP68 Order-Code: XM



Circular connector M 12x1, IP 67, Order-Code: M4



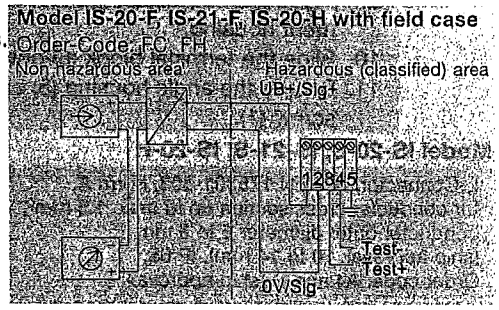
Bayonet-connector, IP 67 / Order-Code: C6



Cable connection in the spring clip terminal

- Cover the stripped wire ends with end splices.
- Unscrew the case cover.
- Loosen the cable gland using an open-end wrench, wrench size 24.
- Lead the cable through the cable gland into the opened case head.
- Press the corresponding plastic lever at the spring clip terminal down using a screw driver, so that the clamped contact will be released.

Model IS-20-F, IS-21-F, IS-20-H with field case
Order-Code: FC, FH



- Lead the prepared flying lead into the opening and let go of the plastic lever, so that the flying lead will be squeezed inside the spring clip terminal.
- After connecting the individual wires, tighten the cable gland and screw down the case over.

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7. Starting, operation GB

Function of the test circuit for 2-wire: By means of the test circuit the current can be metered during normal operation without having to disconnect the instrument. For that purpose you have to connect an ammeter (for applications in hazardous areas; internal resistance < 15 Ohm) to the test +/- terminals.

Specifications — Model IS-20-S, IS-21-S, IS-20-F, IS-21-F, IS-20-H

Specifications without model designation apply for all models.

Pressure ranges *)	IS-2 ✱ -S, IS-2 ✱ -F	bar	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5
Over pressure safety	IS-2 ✱ -S, IS-2 ✱ -F	bar	1	1.5	2	2	4	5	10	10
Burst pressure	IS-2 ✱ -S, IS-2 ✱ -F	bar	2	2	2.4	2.4	4.8	6	12	12
Pressure ranges *)	IS-2 ✱ -S, IS-2 ✱ -F	bar	4	6	10	16	25	40	60	100
Over pressure safety	IS-2 ✱ -S, IS-2 ✱ -F	bar	17	35	35	60	50	80	120	200
Burst pressure	IS-2 ✱ -S, IS-2 ✱ -F	bar	20.5	42	42	96	96	400	550	800
Pressure ranges *)	IS-2 ✱ -S, IS-2 ✱ -F	bar	160	250	400	600	1000 [1]			
Over pressure safety	IS-2 ✱ -S, IS-2 ✱ -F	bar	320	500	800	1200	1500			
Burst pressure	IS-2 ✱ -S, IS-2 ✱ -F	bar	1000	1200	1700 [2]	2400 [2]	3000			
		Pressure ranges for IS-20-H see additional operating instructions 11250418 High pressure								
		{Vacuum, gauge pressure, compound range, absolute pressure are available}								
		*) Only Model IS-20-S, IS-20-F								
		[2] For model IS-21-S, IS-21-F: the value specified in the table applies only when sealing is realised with the sealing ring underneath the hex. Otherwise max. 1600 bar applies.								
Materials										
■ Wetted parts			(other materials see WIKA diaphragm seal program)							
➢ Model IS-20-S, IS-20-F, IS-20-H *)			Stainless steel							
➢ Model IS-21-S, IS-21-F			Stainless steel (Hastelloy C4)							
			O-ring: NBR {FPM/FKM or EPDM}							
■ Case			Stainless steel							
Internal transmission fluid [3]			Synthetic oil {Halocarbon oil for oxygen applications}							
			{Listed by FDA for Food & Beverage}							
		[3] Not for model IS-20-S, IS-20-F with pressure ranges > 25 bar and IS-20-H								

Specifications		Model IS-20-S, IS-21-S, IS-20-F, IS-21-F, IS-20-H	
Power supply U_B	U_B in DC V	10 < U_B < 30 (11 < U_B ≤ 30 with model IS-2 ∗-F and IS-20-H with field case)	
Signal output and maximum load R_A	R_A in Ohm	4 ... 20 mA, 2-wire	
➢ Model IS-2 ∗ -S		$R_A \leq (U_B - 10\ V) / 0.02\ A$ - (length of flying leads in m x0.14Ohm)	
➢ Model IS-2 ∗ -F, IS-20-H with field case		$R_A \leq (U_B - 11\ V) / 0.02\ A$	
Test circuit signal and maximum load		$R_A < 15$ (only model IS-2 ∗-F, IS-20-H with field case)	
Adjustability zero/span	%	± 10 using potentiometers inside the instrument	
Response time (10 ... 90 %)	ms	≤ 1 [4]	
		[4] Response time IS-20-S/-F: ≤ 10 ms at medium temp. below ≤ -30°C for pressure ranges up to 25 bar. Response time IS-21: ≤ 10 ms at medium temp. below < -30 °C (-22°F).	
Dielectric strength		Insulation complies with EN 50020, 6.4.12	
Accuracy	% of span	≤ 0.25 {0.125} [6] (BFSL)	
	% of span	≤ 0.5 {0.25} [5]	
		[5] Accuracy { } for pressure ranges ≥ 0.25 bar, not for IS-20-H	
		Including non-linearity, hysteresis, non-repeatability, zero signal and full scale error (corresponds to error of measurement per IEC 61298-2).	
		[6] Adjusted in vertical mounting position with lower pressure connection	
Non-linearity	% of span	≤ 0.2 (BFSL) according to IEC 61298-2	
1-year stability	% of span	≤ 0.2 (at reference conditions)	
Permissible temperature of			
■ Medium [7] [9]		-20 ... +80 °C [8]	-4 ... +176 °F [8]
		(Extended temperature ranges see chapter 7 „Relation of medium temperature to ambient temperature")	
■ Ambience [7] [9]		-20 ... +80 °C [8]	-4 ... +176 °F [8]
■ Storage [7]		-30 ... +105 °C	-22 ... +221 °F
		[7] Also complies with EN 50178, Tab. 7, Operation (C) 4K4H, Storage (D) 1K4, Transport (E) 2K3	

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Specifications — Model IS-20-S, IS-21-S, IS-20-F, IS-21-F, IS-20-H

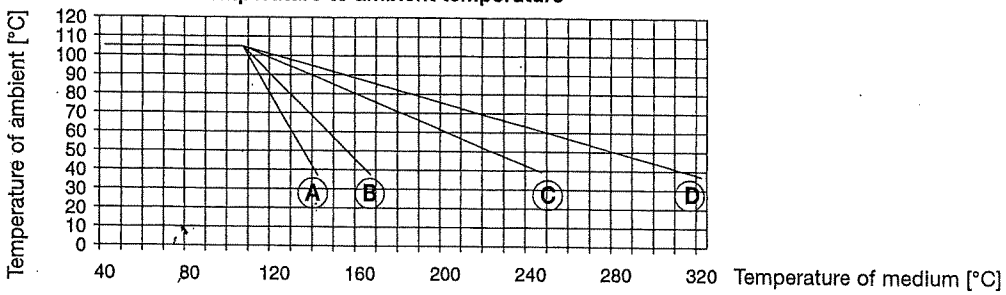
	[6] Other temperature ranges are possible, depending on the electrical connection; see EC-type examination certificate, e.g. -30 ... +105 °C / -22 ... +221 °F	
Compensated temp range		0 ... +80 °C | 32 ... +176 °F
Temperature coefficients within compensated temp range		
■ Mean TC of zero	% of span	≤ 0.2 / 10 K (≤ 0.4 for pressure range ≤ 250 mbar)
■ Mean TC of range	% of span	≤ 0.2 / 10 K
⟨Ex⟩ - protection	ATEX	Category [7) 9)] 1G, 1/2G, 2G, 1D [10)], 1/2D [10)], 2D [10)], M1, M2
Ignition protection type		EEx ia I/II C T4, EEx ia I/II C T5, EEx ia I/II C T6
	[9)] Read the operating conditions and safety-relevant data in the EC-type examination certificate in any case (BVS 04 ATEX E 068 X)	
	[10)] Not for ...	
Ex – protection	FM, CSA	Class I, II and III
Ignition protection type		Instrinsic safe Class I, II, III Division 1, Group A, B, C, D, E, F, G and Class I, Zone 0 AEx ia II C
CE - conformity		89/336/EEC interference emission and immunity see EN 61 326, interference emission limit class A and B
		ATEX EN 50 014 (general part), EN 50 020 (instrinsic safety), (EN 50 284 (Zone 0)), (EN 50 281-1 (dust-Ex)), EN 50 303 (mining industry))
FM, CSA		FM standards according to FMRC 3600, 3610, 3611 (including supplement #1), ISA-S12.0.01, IEC 60 529 (including amendment #1), CSA standard C22.2 No. 0, M1991, 142-M1987, 157-M1992, UL 50, Eleventh Edition / UL 508, Seventeenth Edition / UL 913, Sixth Edition
HF immunity	V/m	10
BURST	KV	2
Shock resistance ➢ Model IS-2∗-S	g	1000 according to IEC 60068-2-27 (mechanical shock)
➢ Model IS-2∗-F	g	600 according to IEC 60068-2-27 (mechanical shock)

Specifications		Model IS-20-S, IS-21-S, IS-20-F, IS-21-F, IS-20-H
Vibration resistance ➢ Model IS-2∗-S	g	20 according to IEC 60068-2-6 (vibration resonance)
➢ Model IS-2∗-F	g	10 according to IEC 60068-2-6 (vibration resonance)
Wiring protection		Protected against reverse polarity and short circuiting on the instrument side
Mass ➢ Model IS-2∗-S	kg	Approx. 0.2
➢ Model IS-2∗-F	kg	Approx. 0.35
➢ Model IS-20-H	kg	Approx. 0.3 (approx. 0.45 with version field case)

*) In an oxygen version model IS-21 is not available. In an oxygen version model IS-20 is only available in gauge pressure ranges ≥ 0.25 bar with media temperatures between -20 ... +60 °C / -4 ... +140 °F and using stainless steel or Elgiloy® wetted parts.
( ) Items in curved brackets are optional extras for additional price.

When designing your plant, take into account that the stated values (e.g. burst pressure, over pressure safety) apply depending on the material, thread and sealing element used.

Relation of medium temperature to ambient temperature



Model	IS-20-H	IS-2∗-S/ -F		
Version	(A)	(B)	(C)	(D)
Cooling in		2	3	5
Constant K	0.34	0.47	0.68	0.76

Calculation of max. temperature of ambience:

$T_{amb} = T_{med} + (T_B - T_{med}) / K$

Calculation of cooling element:

$T_B = T_{med} - (T_{med} - T_{amb}) \times K$

T_B = Operation temperature of transmitter
T_{med} = max. temperature of process medium
T_{amb} = max. temperature of ambience
K = Constant of cooling element

Functional test

Warning

- Open pressure connections only after the system is without pressure!
- Observe the ambient and working conditions outlined in section „Technical data.
- Please make sure that the pressure transmitter is only used within overload threshold limit at all times!

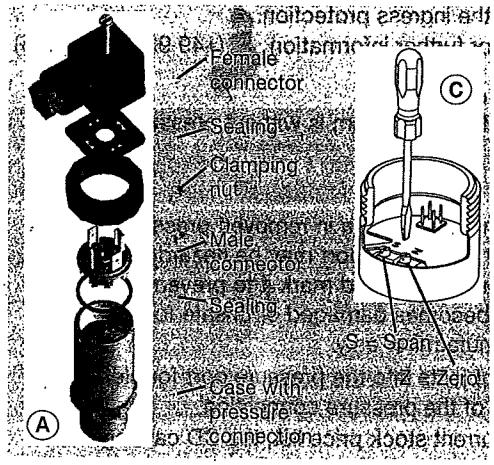
Caution

When touching the pressure transmitter, keep in mind that the surfaces of the instrument components might get hot during operation.

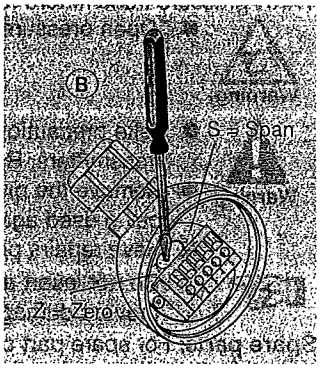
The output signal must be proportional to the pressure. If not, this might point to a damage of the diaphragm. In that case refer to chapter 9 „Troubleshooting".

Adjustment of zero point/span (only for pressure transmitter with clamping nut and field case)

IS-20-S, IS-21-S, IS-20-H:



IS-20-F, IS-21-F, IS-20-H with field case:



IS-2✳-S, IS-2✳-F, IS-20-H with field case:

- Make sure using a pressure standard with adequate accuracy. Pressure standard with adequate accuracy means with an accuracy that is at least 3x more accurate than the accuracy indicated for the instrument.
- Please make sure that no braids get torn or pinched during the assembly / disassembly of the connectors.
- Remove the female connector. Open the pressure transmitter by detaching the clamping nut (see Fig Ⓐ). Carefully remove the male connector from the case.
  Open the pressure transmitter by twisting off the field case cover (see Fig. Ⓑ).
- Adjust the zero point (**Z**) (see Fig. Ⓑ+Ⓒ) by generating the lower limit of the pressure range.
- Adjust the span (**S**) by generating the higher limit of the pressure range.
- Check the zero point.
- If the zero point is incorrect, repeat procedure as required.
- Close the pressure transmitter carefully.Make sure that the sealings are notdamaged and check their correct position in order to ensure the ingress protection.

Recommended recalibration cycle: 1 year For further information (+49 9372/132-295)

8. Maintenance, spare parts

WIKA pressure transmitters require no maintenance!

Warning

- Open pressure connections only after the system is without pressure!

Warning

- Take precautions with regard to remaining media in removed pressure transmitters. Remaining media in the pressure port may be hazardous or toxic!
- Remove the pressure transmitter from service and mark it to prevent it from being used again accidentally, if it becomes damaged or unsafe for operation.
- Have repairs performed by the manufacturer only.

- Do not insert any pointed or hard objects into the pressure port for cleaning to prevent damage to the diaphragm of the pressure connection.

Spare parts: For spare part details refer to our current stock price list, the CD catalog or contact our sales department.

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9. Trouble shooting

Problem	Possible cause	Remedy
No output	Power supply failure	Check power supply
	Open wiring	Check continuity
	Wiring reversed	Correct polarity
	No pressure on port blocked	Check pressure port
	transmitter failure due to wrong	
	Supply voltage or power surge	Replace transmitter
Output steady as pressure changes	Pressure port blocked	Check pressure port
	Transmitter over-pressurized	Replace transmitter
	Transmitter failure due to wrong	
	Supply voltage or power surge	Replace transmitter
Full span output low	Supply voltage too low	Check supply voltage
	Load impedance too high or too low	Adjust load or supply voltage
	Transmitter over-pressurized	Recalibrate Transmitter
		Replace Transmitter
Zero signal too low or too high	Transmitter over-pressurized	Recalibrate Transmitter
		Replace Transmitter
Non-linear output	Transmitter over-pressurized	Replace Transmitter

*) For transmitters with non accessible adjustment potentiometers, or instruments that cannot be recalibrated using the zero and span potentiometers, adjusting the controller or display device can usually compensate for small changes or drifts in the output signal. Test the system for proper operation after adjustments are made. An excessive change in the output signal that cannot be corrected by calibration indicates possible transmitter damage. This may cause the output to be non-linear, requiring transmitter replacement.

If the problem persists, contact our sales department.

USA, Canada

If the problem continues, contact WIKA or an authorized agent for assistance. If the pressure transmitter must be returned obtain an RMA (return material authorization) number and shipping instructions from the place of purchase. Be sure to include detailed information about the problem. Pressure transmitters received by WIKA without a valid RMA number will not be accepted.

10. Storage, disposal

Warning

When storing or disposing of the pressure transmitter, take precautions with regard to remaining media in removed pressure transmitters. Remaining media in the pressure port may be hazardous or toxic!

Storage

Mount the protection cap when storing the pressure transmitter in order to prevent any damage to the diaphragm.

Disposal

Dispose of instrument components and packaging materials in accordance with the respective waste treatment and disposal regulations of the region or country to which the instrument is supplied.

11. EC declaration of conformity

WIKA

EC Declaration of Conformity

Document No.: 6005601
We declare under our sole responsibility, that the CE marked products

Model: IS-20-S, IS-21-S
IS-20-F, IS-21-F
IS-20-H

Description:
Intrinsically safe pressure transmitter
according to the valid datasheet:
PE 81.50, PE 81.51
fulfills the essential requirements of the directive(s)
- 89/336/EEC (EMC)
- 94/9/EC (ATEX)

The devices have been tested according to the norm:
EMC: EN 61326:2002
ATEX: EN 50014:1997+A1+A2
ATEX: EN 50020: 2002
ATEX: EN 50284:1999
ATEX: EN 50303:2000
ATEX: EN 50281-1-1:1998+A1

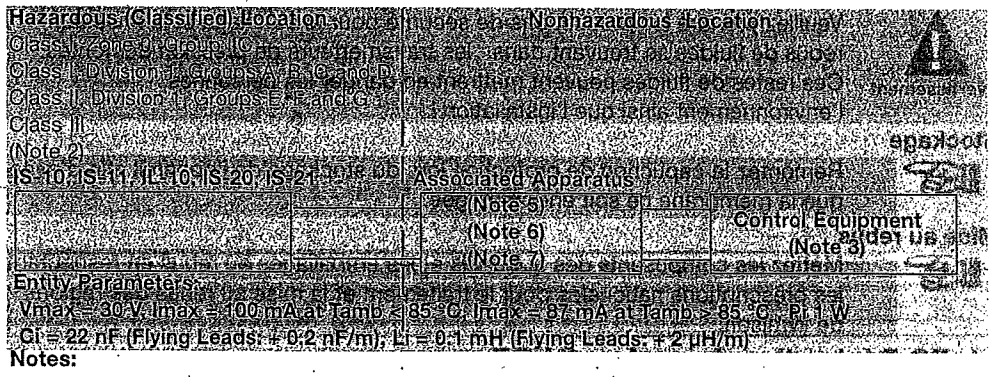
WIKA Alexander Wiegand GmbH & Co. KG
Klingenberg, 23.09.2004

Company division TRONIC
i. V. Stefan Richter
Quality management TRONIC
i. A. Thomas Gerling

WIKA reserves the right to alter these technical specifications.

12. Control Drawing (FM, CSA)

Control drawing S-No. 2323880.03



Notes:

1. The Instrinsic Safety Entity concept allows the interconnection of two FM Approved Intrinsically safe devices with entity parameters not specifically examined in combination as a system when:
   Uo or Voc or Vt ≤ Vmax, Io or Isc or It ≤ Imax, Ca or
   Co ≥ Ci + Ccable, La or Lo ≥ Li + Lcable, Po ≤ Pi.
2. Dust-tight conduit seal must be used when installed in Class II and Class III environments.
3. Control equipment connected to the Associated Apparatus must not use or generate more than 250 Vrms or Vdc.
4. Installation should be in accordance with ANSI/ISA RP 12.6 „Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code® (ANSI/NFPA70) Sections 504 and 505.
5. The configuration of Associated Apparatus must be Factory Mutual Approved under Entity Concept (instrinsically power supply or zener barrier).
6. Associated Apparatus manufacturer's installation drawing must be followed when installing this equipment.
7. The IS-10, IS-11, IL-10, IS-20 and IS-21 Series are Approved for Class 1, Zone 0, applications. If connecting AEx [ib] Associated Apparatus or AEx ib I.S. Apparatus to the IS-10, IS-11, IL-10, IS-20, IS-21 Series the I.S. circuit is only suitable for Class I, Zone 1, or Class I, Zone 2, and is not suitable for Class I, Zone 0 or Class 1, Division 1 Hazardous (Classified) Locations.
8. No revision to drawing without prior Factory Mutual Research Approval.

2132926.02 GB/D/F 01/2006

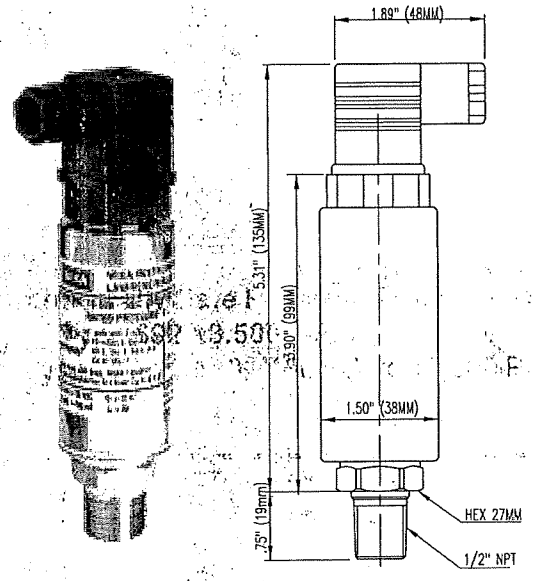
Intrinsically Safe Pressure Transmitters
Type 892.13.500 - Vacuum to 300 PSI
Type 892.23.510 - 400 PSI to 15,000 PSI

Tronic

- FM and Ex approved for Class I Division I locations when used with an approved barrier
- 4-20 mA 2-wire output signal
- Highly resistant to pressure spikes and vibration
- Stainless steel case and wetted parts
- Can be assembled to chemical seals

Intrinsically safe pressure transmitters are engineered for applications requiring class I, Division I protection in hazardous environments. Each unit undergoes extensive quality control testing and calibration to achieve an accuracy ≤ 0.25% full scale. The printed circuit boards use state-of-the-art surface mount technology and are potted in epoxy casting resin for protection against mechanical shock, vibration, and moisture. Each unit is temperature compensated to assure accuracy and long term stability when exposed to severe ambient temperature variations.

The compact design provides an economical, rugged transmitter suitable for many applications in hydraulics and pneumatics, vacuum, test equipment, liquid level measurement, press control, compressor control, pump protection and numerous other processing and control operations.



STANDARD RANGES

RANGE	MAXIMUM*	BURST**	RANGE	MAXIMUM*	BURST**
Type 892.13.500			Type 892.23.510		
30"-0 HgVac	70 PSI	70 PSI	0-400 PSI	1100 PSI	3600 PSI
30"-0-30 PSI	250 PSI	250 PSI	0-500 PSI(A)	1100 PSI	5800 PSI
30"-0-60 PSI	500 PSI	500 PSI	0-600 PSI	1100 PSI	5800 PSI
30"-0-100 PSI	500 PSI	500 PSI	0-750 PSI	1100 PSI	5800 PSI
30"-0-160 PSI	500 PSI	500 PSI	0-1000 PSI	1750 PSI	8000 PSI
30"-0-200 PSI	1100 PSI	1100 PSI	0-1500 PSI	2900 PSI	11,600 PSI
0-50 INWC	30 PSI	30 PSI	0-2000 PSI	4600 PSI	14,500 PSI
0-100 INWC	30 PSI	30 PSI	0-3000 PSI	4600 PSI	14,500 PSI
0-5 PSI	30 PSI	30 PSI	0-5000 PSI	11,600 PSI	25,000 PSI
0-10 PSI	60 PSI	60 PSI	0-8000 PSI	17,400 PSI	35,000 PSI
0-15 PSI(A)	70 PSI	70 PSI	0-10,000 PSI	17,400 PSI	35,000 PSI
0-25 PSI(A)	145 PSI	145 PSI	0-15,000 PSI	21,750 PSI	43,500 PSI
0-30 PSI	145 PSI	145 PSI			
0-50 PSI(A)	250 PSI	250 PSI			
0-60 PSI	250 PSI	250 PSI			
0-100 PSI(A)	500 PSI	500 PSI			
0-160 PSI	500 PSI	500 PSI			
0-200 PSI	500 PSI	500 PSI			
0-250 PSI(A)	1100 PSI	1100 PSI			
0-300 PSI	1100 PSI	1100 PSI			

Notes:
* Maximum pressure, causing no permanent changes in specifications but may lead to adjustable zero and span shifts.
** Burst pressure, leading to destruction of the transmitter and possible loss of media.
(A) Standard ranges available with absolute pressure reference.

Specifications

Input
10-28 VDC

Output & load limitations
4-20mA 2-wire $R_{(max)} = (V_S - 10V)/0.02\ A$

Accuracy

Linearity (B.F.S.L.):	≤ 0.25% of span {0.125%}[1]
Hysteresis:	≤ 0.1% of span
Repeatability:	≤ 0.05% of span
1 yr. stability:	≤ 0.2% of span
Response time:	≤ 1 ms

(10-90% full scale)
Zero & span adjustments: approx +/- 10.0% full scale

Temperature

Effective temperature compensation	+32 °F to 176 °F
Media	-22 °F to 212 °F
Ambient	-4 °F to 176 °F
Storage	-40 °F to 212 °F

Temperature error (reference temperature 70 °F)

On zero (% of span/18 °F)	≤ 0.2
On span (% of span/18 °F)	≤ 0.2

Process connection
1/2" NPTM {other connections available}

Electrical connection
DIN 43650 solderless screw terminal
with 1/2" female conduit(IP 65 / NEMA 5)

Material

Wetted parts	316 stainless steel
Body material	304 stainless steel

Transmitting liquid
Silicone oil to 300 PSI, none in ranges ≥ 400 PSI
{Fluorocarbon oil for oxygen service}

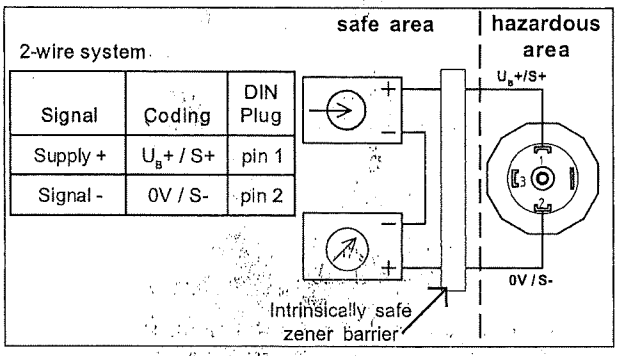
Electrical protection
Protected against reverse polarity

Vibration protection
Internal electronics 100% potted in epoxy casting resin

CE Conformity
Interference emissions per EN 50 081-1 and -2
Interference immunity per EN 50 082-2

Notes: Items in curved brackets { } are available on special order.
[1]Improved accuracy available with pressure ranges ≥ 100 NWC

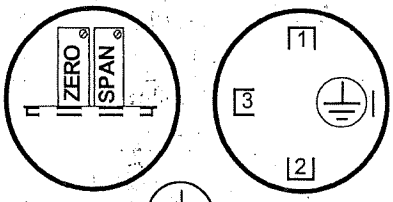
Wiring



Calibration

All WIKA transmitters are calibrated at the factory. In the event calibration is required as a maintenance procedure, please use the following steps:

1. Remove cap
2. Set zero pot
3. Test zero
4. Set span pot
5. Test span
6. Replace cap



Use pin 4 or blue wire for shield

Approval authority

CENELEC/BASEEFA/BVS (European)

FACTORY MUTUAL intrinsically safe with entity approval for:
Class I, Division1, Groups A, B, C, D
Class II, Division 1, Groups E, F, G
Class III, Division 1
hazardous location per WIKA dwg. 1[illegible]4312
nonincendive for Class I, Div 2, Groups A, B, C, D

V max = 28 V Ci = 20 nF
I max = 660 mA Li = 0 uH

Codes compliance
EN 50014/50020 relating to intrinsically safe products
FM-3610 intrinsic standard

Conformity specifications

	E Ex ia II C T5	E Ex ia II C T6
Power supply	10...28 VDC	10...28 VDC
Short circuit Rating	660mA	660mA
Power Rating	(1.75W)	(1.75W)
Operating Temperature	-5°/150 °F(-5 °/165 °F)	-5°/120 °F(-5 °/140 °F)

NOTE: Power supply may be by means of common zener barriers or equivalent certified devices if the transmitters are operated within above temperature limits. The temperatures in parentheses are applicable if the output of the power supply is limited to the power rating values given in parentheses.

THE MEASURE OF
Total Performance™

Ordering Information:
State computer part number (if available) / type number / size / range / connection size and location / options required.

8/2000

WIKA Instrument Corporation
1000 Wiegand Boulevard
Lawrenceville, Georgia 30043-5868
Tel: 770-513-8200 Fax: 770-338-5118
http://www.wika.com e-mail: info@wika.com

INSTALLATION AND MAINTENANCE INSTRUCTIONS

3 way solenoid operated valves normally closed, normally open and universal operation

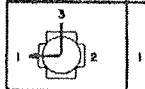
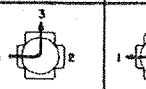
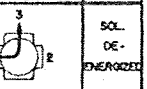
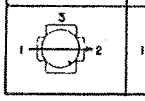
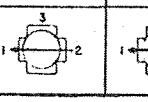
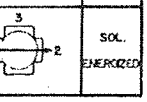
ASCO
Bulletin
8320
Form no. V32001

DESCRIPTION
Bulletin 8320 valves are 3 way solenoid operated valves with all connections located in the body. Valves are brass or stainless steel with 1/8 or 1/4 inch NPT process connections.

Standard valves have an epoxy encapsulated solenoid coil for Type 1,2,3,3S, and 4 combination general purpose and watertight installations. Valves with "EP" prefixes in the catalogue number have encapsulated solenoids suitable for Type 3,3S,4,6, and 7(A,B,C,&D) explosion proof Class I, Group A,B,C,&D and Type 9(E,F,&G)-Dust-Ignition Proof Class II Groups E,F,&G.

OPERATION
Normally Closed: Applies pressure when solenoid is energized; exhausts pressure when solenoid is de-energized. When the solenoid is energized flow is from connection "2" to connection "1". Connection "3" is closed. When solenoid is de-energized flow is from connection "1" to connection "3". Connection "2" is closed.
Normally Open: Applies pressure when solenoid is de-energized; exhausts pressure when solenoid is energized. When the solenoid is energized flow is from connection "1" to connection "2". Connection "3" is closed. When solenoid is de-energized flow is from connection "3" to connection "1". Connection "2" is closed.
Universal: For normally closed or normally open operation, selection or diversion of pressure can be applied to connection "1", "2" or "3".
NOTE: To change from normally closed to normally open or universal operation, consult factory.

FLOW DIAGRAMS

NORMALLY OPEN PRESS. AT 3	NORMALLY CLOSED PRESS. AT 2	UNIVERSAL-PRESS. AT ANY ORIFICE	FORM
			SOL. DE-ENERGIZED
			SOL. ENERGIZED

TEMPERATURE LIMITATIONS
For maximum valve ambient and fluid temperatures, refer to chart below. Check catalogue number prefixes and watt ratings to determine maximum temperatures.

TEMPERATURE LIMITATIONS 8320Q, CATA. 32C

WATT RATING	CATALOGUE PREFIX	MAX. AMBIENT TEMP. F.	MAX. FLUID TEMP F.	
			1/8 NPT	1/4 NPT
10.1 & 17.1	NONE,FB,KF,KP, SC,SD,SF,SP	125	180	200
10.1 & 17.1	HB,HT,KB,KH,SS, ST,SU	140	160	200
11.6 & 22.6	NONE,KB,KF,KP, SC,SD,SF,SP	104	120	150
11.6 & 22.6	HP,HT,KB,KH,SS, ST,SU,SV	104	120	150

* MINIMUM AMBIENT TEMPERATURE - 40 F.

INSTALLATION
Check nameplate for correct catalogue number, pressure, fluid and electrical service.

Positioning
This valve is designed to perform properly when mounted in any position. For optimum performance and life, the solenoid should be mounted vertical and upright.

Mounting
Valves may be pipe mounted, direct mounted with self tapping screws in the case of forged brass bodies, or mounted with optional factory supplied mounting brackets.

Piping
Connect pipe or tubing to valve according to markings on the valve body. Refer to flow diagrams above. Apply pipe compound or teflon tape sparingly to male pipe threads only. When tightening connections do not use the valve body or solenoid as a lever. Locate wrenches as close as possible to the connection point.
IMPORTANT: For protection of the solenoid valve, install a strainer or filter suitable for the service involved in the inlet side as close to the valve as possible. Periodic cleaning is required depending on service conditions.

Wiring
Wiring must comply with local and national codes. Solenoids are provided with 1/2" conduit hubs or other optional connection methods as illustrated in Fig.2,3. The solenoid may be rotated to facilitate electrical connection.
NOTE: Alternating current and direct current solenoids are built differently. To convert one to the other it is necessary to change the complete solenoid assembly including core tube, bonnet, and core assembly.

MAINTENANCE
NOTE: It is not necessary to remove the valve from the pipeline for repairs.
WARNING: Turn off electrical power supply and de-pressurize valve before making repairs.

Cleaning
All solenoid valves should be cleaned periodically. The time between cleanings will vary depending on the fluid and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive noise, or leakage will indicate that cleaning is required. Clean valve strainer or filter when cleaning the valve.

Preventive Maintenance
1. Keep the fluid flowing through the valve as free from dirt and foreign material as possible.
2.While in service, the valve should be operated at least once a month to insure proper opening and closing.
3.Depending on the fluid and service conditions, periodic inspection of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. Replace worn or damaged parts with an ASCO rebuild Kit.

Causes of Improper Operation
1. Faulty Control Circuits: Check the electrical system by energizing the solenoid. A metallic "click" signifies that the solenoid is operating. Absence of the "click" indicates loss of power supply. Check for loose or blown fuses, open circuited or grounded coil, broken lead wires or splice connections.
2. Burned-Out Coil: Check for open-circuited coil. Replace coils as necessary. Check supply voltage; it must be the same as specified on coil.
3. Low voltage: Check voltage across the coil lead. Voltage must be at least 85% of coil rating.
4. Incorrect Pressure: Check valve pressure. Pressure to valve must be within range specified on nameplate.
5. Excessive Leakage: Disassemble valve and clean all parts. Replace worn or damaged parts with an ASCO Rebuild Kit.

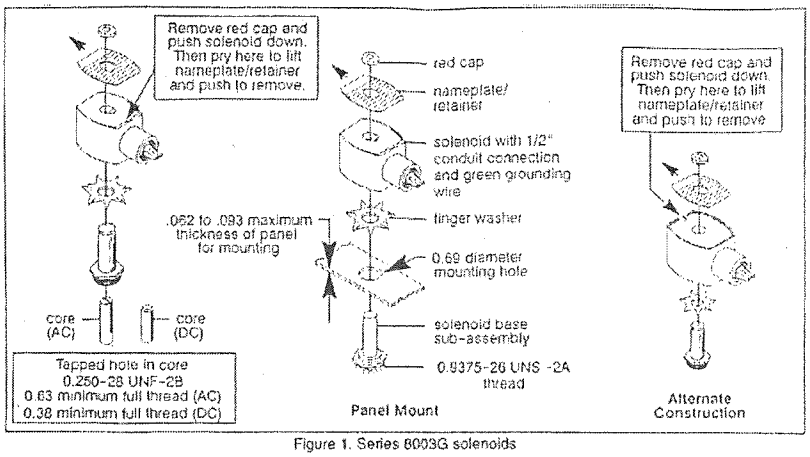


Figure 1. Series 8003G solenoids

Torque Chart

Part Name	Torque Value in Inch-Pounds	Torque Value in Newton-Meters
terminal block screws	10 ± 2	1,1 ± 0,2
socket head screw	15 - 20	1,7 - 2,3
center screw	5 ± 1	0,6 ± 0,1

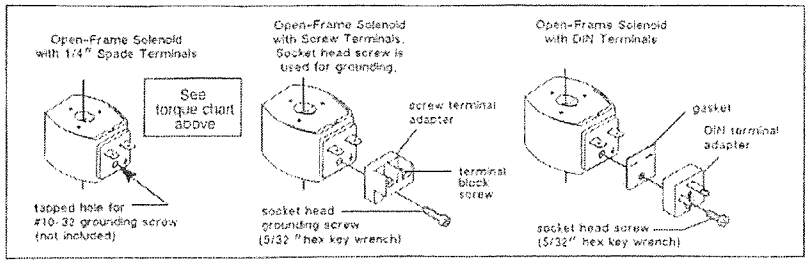


Figure 2. Open-frame solenoids

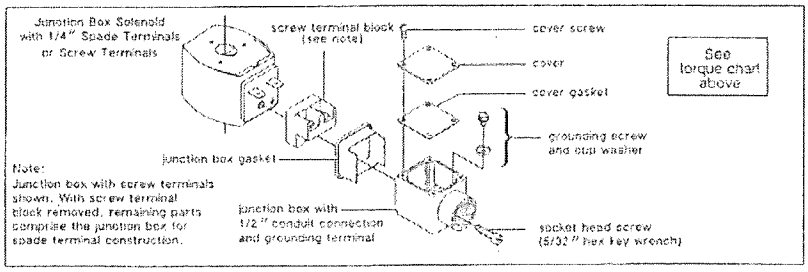


Figure 3. Junction box (optional feature)

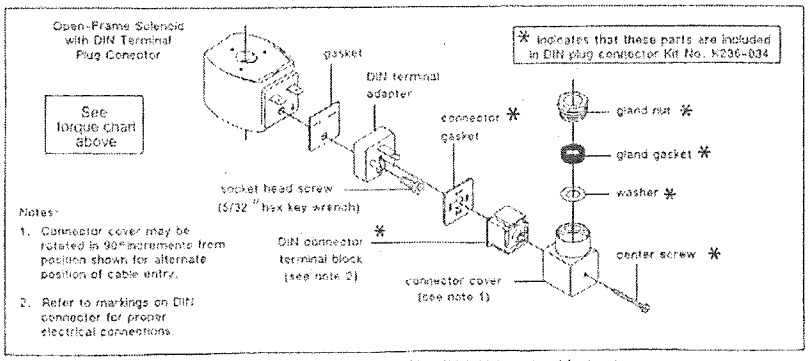


Figure 4. DIN plug connector kit No. K230-034 (optional feature)

COIL REPLACEMENT (REF. FIG. 1)

Turn off electrical power, disconnect coil lead wires and proceed as follows:

1. Remove red cap, and nameplate.
2. Slip coil off solenoid base sub-assembly
3. Reassemble in reverse order of disassembly.

VALVE DISASSEMBLY AND REASSEMBLY (REF. FIG. 1)

Turn off electrical power supply and de-pressure valve.

1. Remove retaining cap and slip entire solenoid off solenoid base sub-assembly.
2. Unscrew bonnet or solenoid base sub-assembly. Remove core assembly, core spring and body gasket.
3. Remove end cap, body gasket, disc spring, disc holder, disc or disc holder assembly.
4. All parts are now accessible for cleaning or replacement. Replace worn or damaged parts with a complete Spare Parts Kit for best results.
5. Reassemble in reverse order of disassembly paying careful attention to exploded view provided.

ORDERING INFORMATION FOR SPARE PARTS KITS
When Ordering Spare Parts Kits or Coils Specify Valve Catalog Number, Serial Number and Voltage.

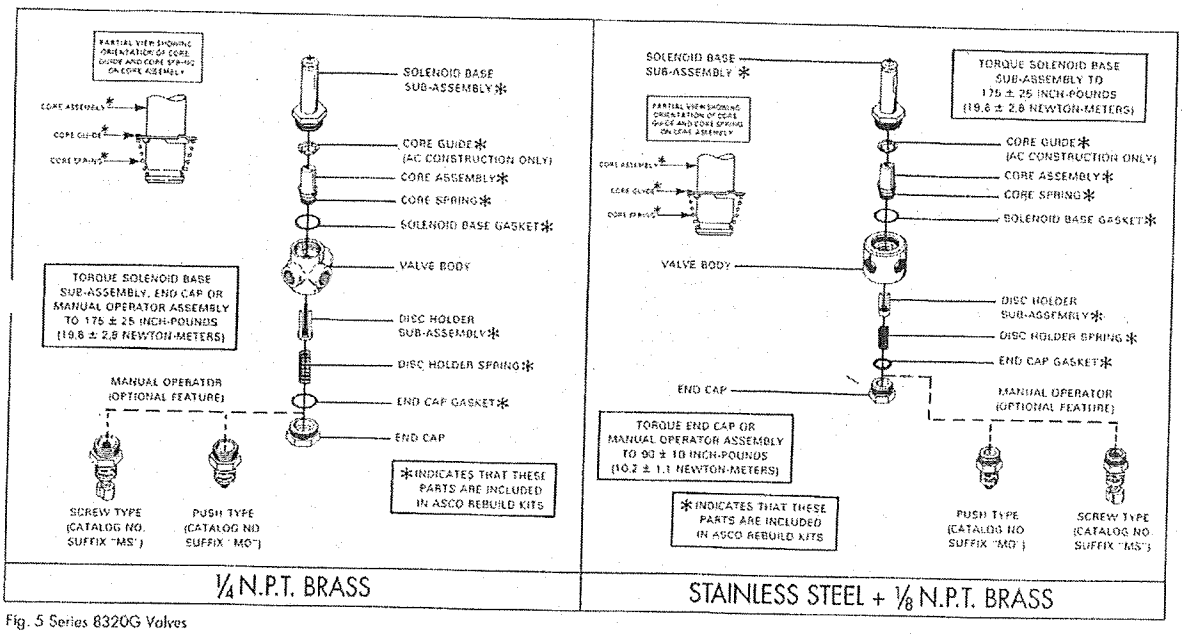


Fig. 5 Series 8320G Valves

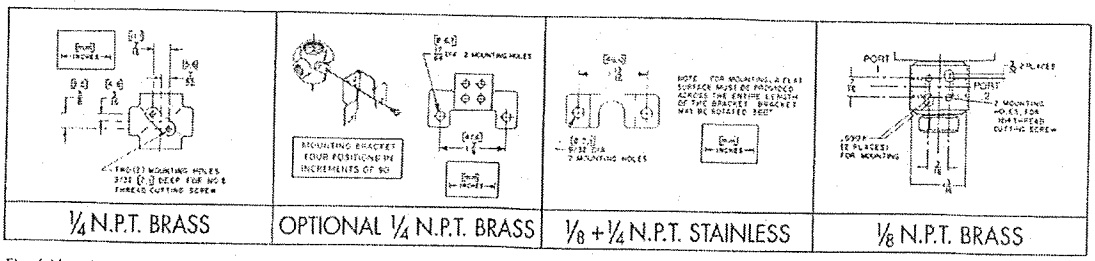


Fig. 6 Mounting

INSTRUCTIONS DE MONTAGE ET D'ENTRETIEN

DESCRIPTION

Les instructions suivantes sont inclues pour vous donnez des informations générales pour l'installation de nos pièces de rechange. Ces instructions sont très générales et couvre plusieurs type de soupapes, telle que soupapes a commande par solenoïde, a commande par pilote externe, etc.. Pour information plus exacte au sujet d'une soupape particulière, voir les pages d'instructions qui sont inclues avec la soupape en question.

FONCTIONEMENT

Référez au dessin d'assemblage.

INSTALLATION

Vérifiez la plaque d'indentification pour vous assurez que le numéro de catalogue, le voltage, la pression et le service sont tels que requis.

MISE EN PLACE

Référez au dessins d'assemblage.

TUYOTAGE

Couplez les conduits à la soupape selon les indications données sur le chassis de la soupape. Appliquez la pâte pour conduits généreusement sur les pas de vis du conduit mâle seulement: si on l'applique sur le pas de vis de la soupape même, il y à danger que la pâte pénètre dans la soupape et cause des difficultés de fonctionnement.

- important - Pour meilleur operation, il est recommandé qu'un filtre approprié au service soit installé au plus près de la soupape que possible, et que ce filtre soit nettoyé périodiquement.

- avertisement - Evitez de trop serrer les tuyaux. Appliquez les clefs le plus près possible du point de raccordement du tuyau et du corps de la soupape. N'utilisez pas le soupape comme lévier.

PRESSION DIFFERENTIELLE DE FONCTIONEMENT (Minimum)

Pour toutes soupapes qui exigent une pression différentielle minimum, il est critique que les lignes de pression et d'échapement ne soient pas réduites. La pression minimum tel qu'indiqué sur la plaque d'identification doit être maintenue.

CABLAGE

Le cablage doit être conforme aux règlements des Codes Electriques soit Nationaux, soit de l'endroit ou l'installation est effectuée.

ENTRETIEN

- ATTENTION - Débranchez l'alimentation électrique (ou pression auxiliaire) ainsi que la pression avant d'effectuer aucune réparation.

NETTOYAGE

Un nettoyage périodique de toutes les soupapes et accessoires est recommandé. L'intervalle entre nettoyage variera selon les conditions de service.

ENTRETIEN PREVENTIF

1. Assurez vous que la matière circulant dans la soupape est aussi propre que possible.
2. Pendant son service, opérez la soupape au moins une fois par mois pour assurer l'opération normale de la soupape.
3. L'inspection périodique (selon les conditions de service) des parties internes de la soupape est recommendée afin d'observez si il y à endomagement ou usure excessive. Nettoyez la soupape au complet et installez les nouvelles pièces de rechange.

FONCTIONEMENT FAUTIF

1. **Defaut du circuit de contrôle:** Vérifiez le systeme électrique en mettant le solénoïde sous tension. Un déclic métallique signifie que le solénoïde fonctionne normalement. L'absence d'un déclic métallique indique une perte d'alimentation du courant. Vérifiez la présence de fusibles fondus, d'une bobine avec un circuit ouvert ou mise à terre, d'un fil ou d'une éprisure brisée.
2. **Basse tension:** Vérfiez le niveau de tension. La tension doit être au moins a 85% du niveau indiqué sur la plaque d'identification.
3. **Pression inexate:** Vérifiez que la pression et le service conforme à celle indiqué sur la plaque d'identification de la soupape.
4. **Fuite de pression:** Démontez la soupape et nettoyez toutes les pièces. Installez les pièces de rechange si nécessaire. Vérifiez qu'il n'y à pas d'objets étrangers qui bloquent ou causent la fuite de pression.

   - important - Certaines soupapes, à cause de leurs sieges non-élastiques sont allouées une fuite de pression minime. Consultez le bureau de vente Asco.

ENSEMBLES DE PIECES DE RECHANGE

Pour commander les ensembles de pièces de rechange et les bobines pour les soupapes ASCO, spécifiez le numéro de catalogue, le voltage, la pression et le service en question.

- a noter - Les pièces indiquées avec (*) sur le dessin d'assemblage sont inclues dans l'ensemble de pièces de rechange.