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4-1/2 in. (114 mm) dial Temperature MURPHYGAGE® and SWITCHGAGE®

**Model Series: SPLG, SPLC, SPLBP, 45TE and 45TEBP
Options: -OS and -ES**

Installation Instructions



*Selected configurations are CSA approved. Consult factory for details

**Products covered by this literature comply with EMC Council directive 89/336/EEC regarding electromagnetic compatibility as noted. Does not cover "BP" models.

**00-02-0167
Revised 2012-06-05
Section 10**

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Please read the following information before installing.

BEFORE BEGINNING INSTALLATION OF THIS MURPHY PRODUCT:

- A visual inspection of this product for damage during shipping is recommended before installation.
- It is your responsibility to ensure that qualified mechanical and electrical technicians install this product.
- Disconnect all electrical power to the machine.
- Make sure machine cannot operate during installation.
- Follow all safety warnings of the machine manufacturer.
- Read and follow all installation instructions.
- Please contact FW MURPHY immediately if you have any questions.

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General Information

SPLC and SPLFC SWICHGAGE® instruments have high and low limit contacts to monitor, alarm or shutdown. The SPLC has a flanged case. SPLFC has a flush mount case intended for installation within a panel. A method to override the low limit contact for startup is provided on most models (see Operation Test Instructions on page 3).

45TE and 45TEF Series are versions of the SPL Series with 2-snap acting SPDT switches instead of the pointer type contacts. The 45TE Series does not include low contact lockout.

SPLBP and 45TEBP models are designed to start and stop electric motor driven equipment. The pilot duty contacts are connected to a latching control relay for automatic ON/OFF control, either directly or through a motor starter.

Options -OS and -ES

The -OS (oil sealed case) and the -ES (environment sealed case) options for corrosive environment feature flush mount case design to be installed within a panel.

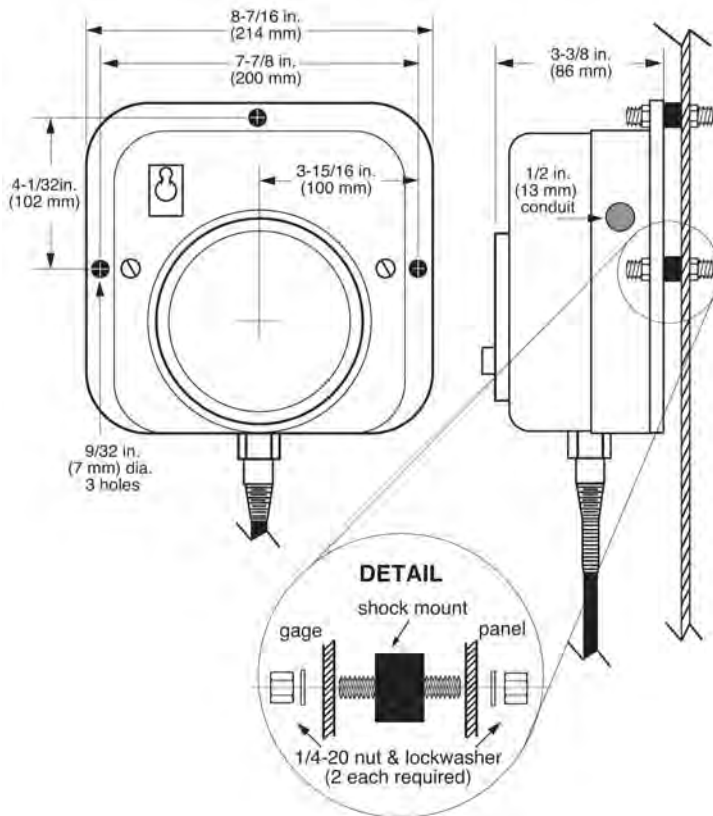
Precautions

- Do NOT exceed rated temperature range.
- Use shock mounts as necessary to protect from vibration.
- Cutting or sharp bending the capillary will cause permanent damage to the SWICHGAGE® and will void the warranty.
- Excess capillary should be carefully coiled and secured away from damage.
- Do not route capillary along exhaust manifold.
- Avoid routing capillary at level higher than gage mounting.

Case Mounting

Wall Mount

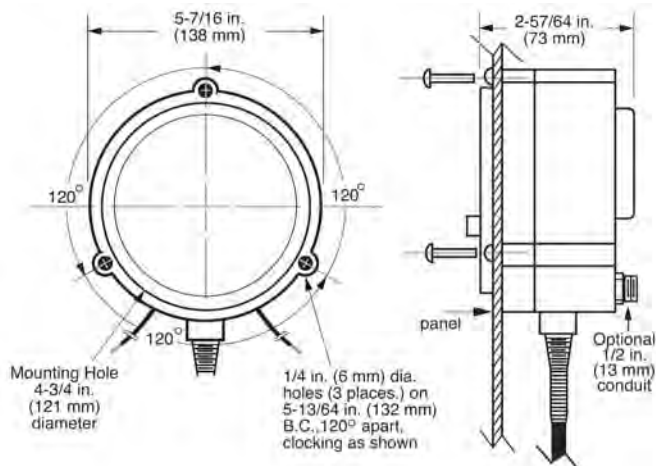
Flanged case design intended for wall mount. Shown with shock mounts (optional).



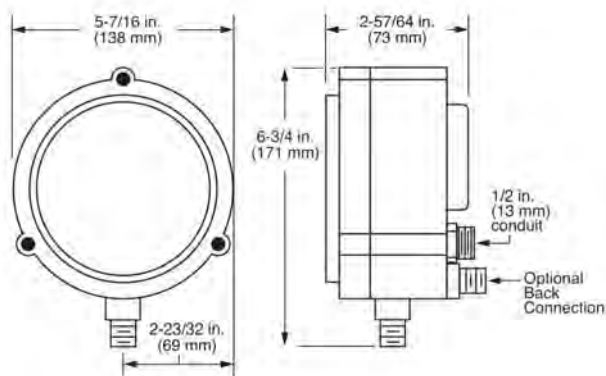
Case Mounting—continued

Flush Mount

A round case design to be mounted within a panel from 1/32 in. (1 mm) to 1/8 in. (3 mm) thick.

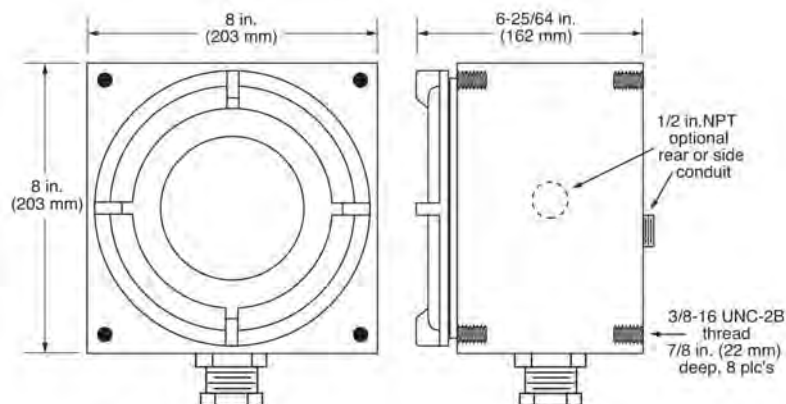


Options -OS, -ES (flush mount case)

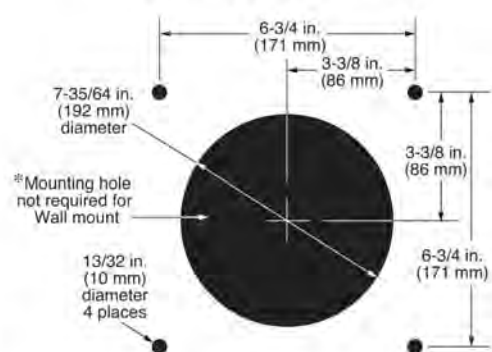


Explosion-proof Case Mount

Explosion-proof case can be mounted from face or rear.



Flush mount/Wall mount



Sensing Bulb–Thermowell Installation



Precautions

Cutting or sharp bending the capillary will cause permanent damage to the SWICHGAGE® and will void the warranty. Excess capillary should be carefully coiled and secured away from damage. Do not route capillary along exhaust manifold. Avoid routing capillary at a level higher than gage mounting.

Installing Sensing Bulb

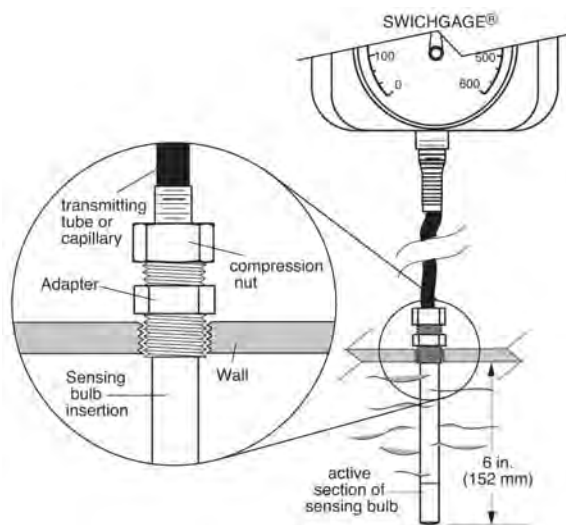
1. Install the 1/2 NPT adapter into the application.
2. Slip compression nut and ferrule onto bulb.
3. Insert the sensing bulb directly through the adapter and fully immerse it into the process without interference. Be sure to leave enough of the bulb to allow the compression nut and ferrule to be tightened.
4. Keep the bulbs active section in the middle of the process flow.
5. Tighten the compression nut and ferrule. This will keep the bulb in place and obtain a full seal.

Installing Thermowell

Thermowell is recommended for high pressure applications or corrosive environments. It also allows temperature sensor to be changed or adjusted without opening connection to process.

1. First screw the thermowell into the process (pipe line).
2. Pass the sensing bulb through the nut and ferrule.
3. Fully insert the sensing bulb into the thermowell housing and secure it with the compression nut.

NOTE: The use of temperature transmitter grease or silicon grease on the tip of the sensing bulb is recommended to facilitate heat transfer to sensing bulb junction.



Limit Contacts / Indication Pointer Adjustments

Limit Contact Adjustments

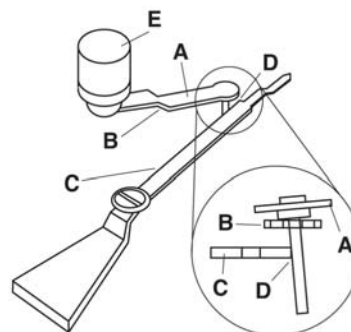
Facing the dial, left side knob is “Low limit” contact. Right side is “High limit” contact.

NOTE: the 45TE Series features a stacked limit indicator knob with both limit adjustments included. The bottom half knob adjusts the “Low” limit indicator, the top half is to adjust the “High” limit indicator.

To set limit contact, turn the knob to the desired point on the scale.

Limit Contact Wiping Feature (SPL)

The force of pointer causes the flexible contact arm (A) to “tilt” resulting in a wiping action (D). This clears away film or corrosion formed on the contact surfaces.

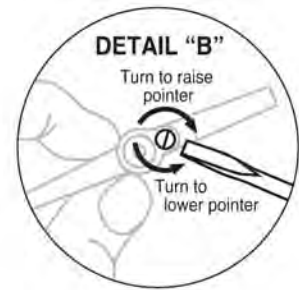
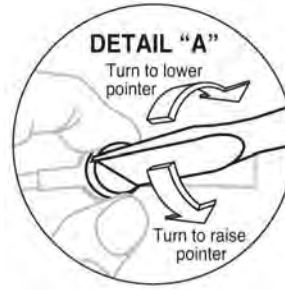


Limit Contacts / Indication Pointer Adjustments—continued

Indication Pointer Adjustments

To reset to zero or to a known value proceed as follows:

1. Turn off power. Remove the snap ring and the lens/contact assembly (or open hinged cover).
2. Hold the pointer hub with thumb and forefinger then turn screw to desired point. Avoid touching the gold flashed, silver contact areas. See **DETAIL “A”**. For the **45TE Series** see **DETAIL “B”**.
3. Replace lens contact assembly and snap ring (or close hinged cover), and turn on power.



NOTE: Span adjustments and recalibration must be performed by an authorized mechanic or return the unit to Frank W. Murphy Mfr.

Operation Test Instructions

SPLC and SPLFC Series

1. Perform operation test after the unit is installed and wired appropriately (see Typical Electrical Diagrams on page 4).
2. When temperature is applied to the sensing bulb the pointer will travel in a clockwise direction. (Adjust contacts to desired set points.)
3. Place the toggle switch (SPLC Series only) in the “start” position or otherwise override low contact. After the indication pointer rises past the low limit contact, return the toggle switch to the “run” position.
4. To test the limit contacts, turn the limit contact to be tested until it touches the pointer. That will trip the control circuit.
5. Reset the shutdown or alarm circuit device.

45TE Series

1. Perform steps 1 and 2 in the SPLC Operation Test Instructions.
2. To test the switches, turn the limit indicator until it touches the pointer, then continue to rotate until the snap-switch operates*.
3. Reset the shutdown or alarm circuit device.

* The trip point indicator will stop the pointer movement slightly before the snap-switch operates. As temperature continues to increase or decrease, the trip point setting is reached.

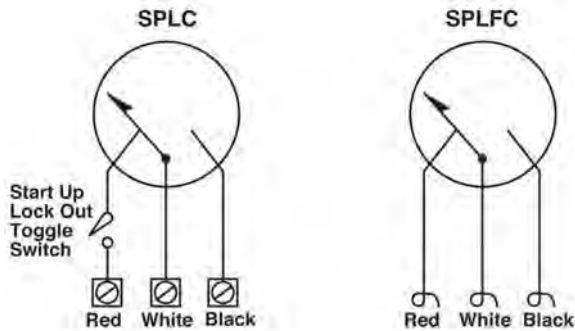
Typical Electrical Diagrams



WARNING: Perform the wiring operation with the power source “OFF”. Make sure the voltage and current requirements are within the SWICHGAGE® ratings. Before wiring determine voltage and polarity for the application. Use the appropriate wire size. All connections should be made using a spade (forked) or ring terminals. For pigtail connections use wire nuts. Conduit is recommended to protect wires from damage.

SPLC and SPLFC

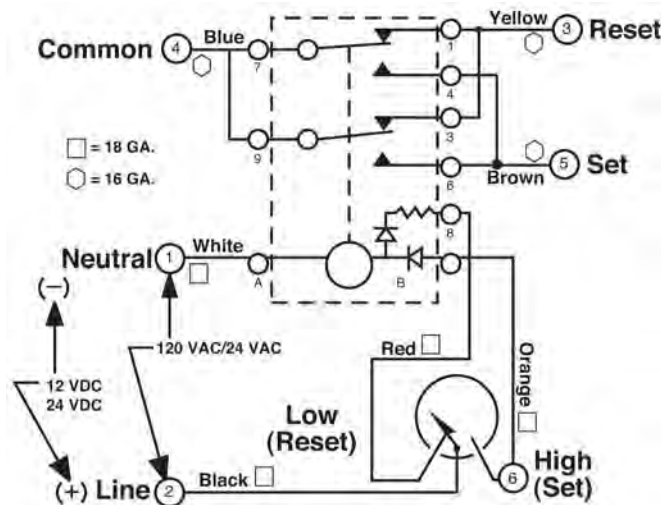
Contact Ratings: 1 SPDT, Center off; 2A, 30VDC, 1A, 125VAC pilot duty.



NOTE: Diagrams above show the pointer in the at rest (shelf) position.

SPLBP

Contact Ratings: SPDT dry relay contacts; 10 A, 125 VAC

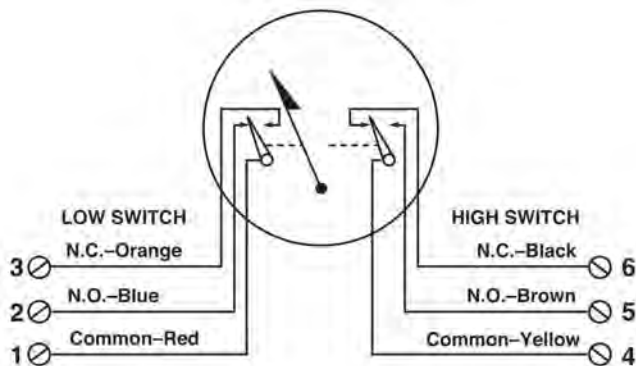


NOTE: Diagram above shows the pointer in the at rest (shelf) position.

Typical Electrical Diagrams—continued

45TE and 45TEF

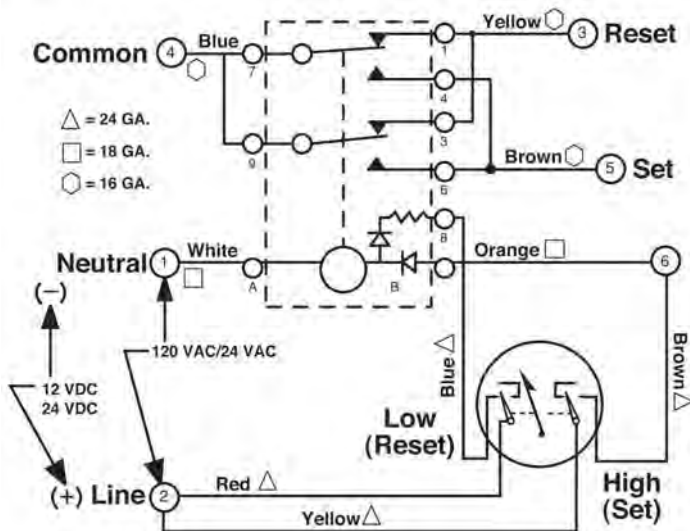
Contact Ratings: 2-SPDT snap-switches (One for high and low temperature); 2 A inductive, 250 VAC each switch



NOTE: Diagram above show the pointer in the at rest (shelf) position.

45TEBP

Contact Ratings: SPDT dry relay contacts; 10 A, 125 VAC.



NOTE: Diagram above shows the pointer in the at rest (shelf) position.

Specifications

Dial: White on black, dual scale, °F and °C standard, 4-1/2 in. (114 mm) diameter.

Case: Die cast aluminum, surface or panel mount.

Capillary: PVC armored copper tube, 5 ft. (1.5 m) long standard.

Sensing Bulb: Copper bulb std.: 1/2 in. (13 mm) OD; Length 7 in. (178 mm). Pressure rating: 600 psi (4.1 MPa) [41 bar]. Connection: 1/2 NPTM compression fitting.

NOTE: Use of thermowell is highly recommended.

Switch Reset Deadband: Approximately 10% FS.

Snap-Acting Switches: See wiring information (page 4).

Dry Relay Contact ("BP" Models): 10 A @ 28 VDC or 10 A @ 120 VAC.

Wire Connections (Surface Mount): 1/2 NPTF conduit/terminal block.

Wire Connections (Panel Mount): Wire leads, 18 AWG (1.0 mm²) x 9 in. (229 mm) long.

Wire Connections (-ES, -OS, -CC): 1/2 NPTM conduit and wire leads, 24 AWG (0.22 mm²) x 33 in. (838 mm) long.

Overrange: Do not exceed 10% FS above full range.

Item Weight: 8 lbs (3.6 kg) approx. Explosion-proof models: 22 lb. (10 kg) approx.

Item Dimensions: 16 x 11 x 5-1/2 in. (406 x 279 x 140 mm) approximately. Explosion-proof: 12 x 12 x 9 in. (305 x 305 x 229 mm) approximately.

Accuracy

Temperature Range	First 1/3	Middle 1/3	Upper 1/3
15 to 250°F (9 to 121°C)	± 8°F (± 4°C)	± 2°F (± 1°C)	± 2°F (± 1°C)
130 to 350°F (54 to 177°C)	± 8°F (± 4°C)	± 2°F (± 1°C)	± 3°F (± 1.5°C)
260 to 450°F (127 to 232°C)	± 8°F (± 4°C)	± 2°F (± 1°C)	± 3°F (± 1.5°C)

5311 South 122nd East Avenue
Tulsa, Oklahoma 74146 USA
Phone: +1 918 317 4100 Fax: +1 918 317 4266
E-mail: sales@fwmurphy.com
Website: www.fwmurphy.com

5757 Farinon Drive
San Antonio, Texas 78249 USA
Phone: +1 210 495 9772 Fax: +1 210 495 9791
E-mail: info@econtrols.com
Website: www.econtrols.com

105 Randon Dyer Road
Rosenberg, Texas 77471 USA
Phone: +1 281 633 4500 Fax: +1 281 633 4588
E-mail: css-solutions@fwmurphy.com
Website: www.fwmurphy.com

Church Road, Laverstock
Salisbury, SP1 1QZ, UK
Phone: +44 1722 410055 Fax: +44 1722 410088
E-mail: sales@fwmurphy.co.uk
Website: www.fwmurphy.co.uk

Hangzhou Economic & Technological Development Area
Hangzhou, Zhejiang, 310018, China
Phone: +86 571 8788 6060 Fax: +86 571 8684 8878
E-mail: apsales@fwmurphy.com
Website: www.fwmurphy.com/company_ch



USA: 800-800-2000 ext. 2323
 UK: 011 0001 2000 ext. 2323
 Canada: 800 800 2000 ext. 2323
 Remained Fixed



www.fwmurphy.com

Apdo. Postal 2-06, Admon "Lomas"
Cord. Arakan 606-16, Lomas 4° Secc.
78211 San Luis Potosí, S.L.P. - Mexico
Phone: +1 918 317 2500
E-mail: lasales@fwmurphy.com
Website: www.fwmurphy.com

230, Regus, Connaught Place Centre
Bund Garden Road, Pune 411001
Maharashtra State, India
Phone: +91 915 813 7633
E-mail: indiasales@fwmurphy.com
Website: www.fwmurphy.com