

Visual indicators provide an economical way to know at a glance when a filter element needs to be replaced. A variety of styles are available, ranging from gauges to mechanical pointers and pop-up cartridges.

Schroeder pointers use a tricolor disk to indicate the element condition. The pointer will reach the red section just before bypassing occurs.

In the case of a mechanical magnetic cartridge, a highly visible orange disk springs, or “pops up”, at the pre-defined setting. Once activated, the orange signal continues to indicate a bypass or clogged condition, even following equipment shutdown, until it is manually reset. The pop-up indicator is interchangeable with other cartridge style indicators (electrical and electrical visual) available from Schroeder. A high pressure (>6000 psi working pressure) of the pop-up indicator is available and is noted below.



D—Tricolor Pointer Dirt Alarm®
P/N A-LF-283CP-1 for plastic pointer only.
For internal linkage and name plate, contact factory.



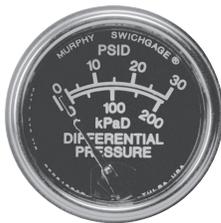
D5—Orange Pop Up Visual Indicator
D5C—Same as D5 but mounted in cap
D5R—Same as D5 but mounted on opposite side of standard location
D9—Stainless Steel version of D5
D9C—Stainless Steel version of D5 mounted in cap



Y—Vacuum Gauge mounted in porting head
P/N LFT-363
YR—Same as Y but mounted on opposite side of standard location P/N LFT-363



Y2—Back mounted 1/8" NPT Tricolor Glycerin-filled Gauge (0-60 psi) P/N LFT-134-2 (0-100 psi) P/N LFT-1081
Y2R—Same as Y2 but mounted on opposite side of standard location P/N LFT-134-2
Y2C—Bottom mounted 1/8" NPT Tricolor Gauge (0-60 psi) located in cap P/N LFT-134-3
Y5—Same as Y2 but located in cap P/N LFT-134-2



LF-4209 (G2213): 0 - 30 psid; **LF-4109** (G2214): 0 - 50 psid; **LF-4711** (G2215): 0 - 70 psid



DPG—Standard Differential Pressure Gauge
P/N LF-10454 or LF-10454V

Photo above for G2213. Other 2 gauges are identical in appearance except for scale.

The thermal lockout feature prevents activation of the indicator below temperatures of 90°F (32°C). This is a welcome feature in mobile applications where fluid temperatures may be well below 90°F at equipment start-up, and will prevent the indicator from showing a premature need to change the element.



D8—Orange Pop Up Visual Indicator with Thermal Lock-out P/N A-LF-3870
D8C—Same as D8 but mounted in cap P/N A-LF-3870
D8R—Same as D8 but mounted on opposite side of standard location P/N A-LF-3870

Visual

Visual with Thermal Lockout

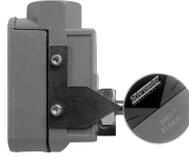
Electrical Visual

In addition to providing an electrical signal to provide a desired action, Schroeder electrical visual indicators also provide a visual indication of when an element needs to be changed. In the case of the MS and MS2 switches, the visual indicator is a color-coded disk, whereas the MS13 and MS14 dirt alarms provide a light.

MS—Cam operated electrical switch P/N LF-376 for switch only.

For cam, color-coded disk, and mounting bracket, order P/N A-LF-831-1#.

For internal linkage, contact factory.



| Code | Type of Contact | Electrical Rating | Connection |
|------|-----------------|------------------------------------------|--------------------|
| MS | SPDT | 15 Amps @ 125/250 vac, 0.5 Amp @ 125 VDC | ½" conduit, female |

Electrical

The electrical indicators (MS Series) provide an electrical signal for activating various electric alarm systems or complete machine shutdown. These cartridge-style indicators are available on most Schroeder pressure, return line, and medium pressure filters and can be used for working pressures up to 5000 psi (345 bar) and cyclic conditions up to 4000 psi (276 bar).

- The design is modular; all electrical indicators consist of an MS10 indicator with the corresponding mating connector added to convert the MS10 to a MS5, MS11 etc.
- The standard micro switch for high current indicators is good for both AC and DC use. A separate micro switch with "gold" contacts is used for low current applications. This means that specification of AC or DC is no longer required (except for MS13 and MS14) in the indicator code or part number.
- Housings of all electrical indicators are made of aluminum.
- The indicator model tag includes the electrical wiring diagram.
- All of our indicators, with the exception of MS16, have a "ground" terminal.
- We are now able to offer the thermal lockout option to high current indicators.
- All indicators can be installed in a filter cap as the wiring harness can be disconnected at the "DIN" connector in order to remove the filter cap.
- All MS indicators have achieved the NEMA4X and IP65 ratings.

Information on these indicators, including drawing, circuit diagram, and photograph is provided on the following pages.

A different set of electrical pressure switches is available for Schroeder tank-mounted filters, along with heavy duty versions.

Schroeder suction filters (ST and models that house the SKB magnetic suction strainer) can be equipped with a vacuum switch.

VS—Vacuum Switch (1/8" NPT, normally open) P/N A-LFT-305

VSR—Same as VS but mounted on opposite side of standard location P/N A-LFT-305

ES—Standard electrical pressure switch (1/8" NPT, normally open) for tank-mounted filters (25 psi bypass) P/N A-LF-927 (40 psi bypass) P/N A-LFT-436

ESC—Electrical pressure switch (MTA & MTB only) P/N A-LF-927

ESR—Same as ES but mounted on opposite side of standard location P/N A-LF-927

ART— P/N A-LFT-436

ES1—Heavy duty electrical pressure switch (1/8" NPT) with conduit connection (25psi bypass) P/N LFT-1010 (cracking over 25 psi) P/N LFT-1106 (43 psi bypass) P/N LFT-1106 (Black = common; Red = N.O.; Blue = N.C.)

ES1R—Same as ES1 but mounted on opposite side of standard location P/N LFT-1010

VS1—Heavy Duty Vacuum Switch (1/8" NPT) P/N LFT-1107, LF Pressure Switch

ES2— Super duty electric switch (1/8" NPT, normally closed) with thermal lockout P/N LF-10908

ES3—Electric pressure switch (1/8" NPT) with DIN connector P/N LF-4499 (Black = common; Red = N.O.; Blue = N.C.)



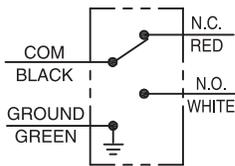
| Code | Type of Contact | Electrical Rating | Connection |
|------|-----------------|------------------------------------------------------------------------|---------------------------------|
| ES | SPST | 8 Amps @ 12 VDC, 1 Amp @ 120 VAC 4 Amps @ 24 VDC, 0.5 Amp @ 240 VAC | Screw Terminal with Rubber Boot |
| ES1 | SPDT | 10 Amps @ 115 VAC 50mA-5A @ 24 VDC | ½" Conduit, Male |

Electrical and Electrical with Thermal Lockout

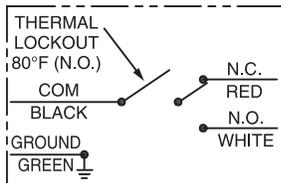


**MS5
MS5LC
MS5T
MS5LCT**

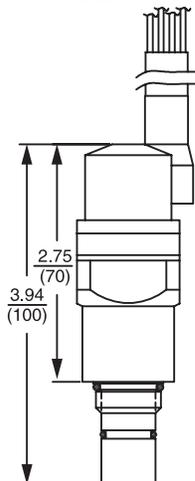
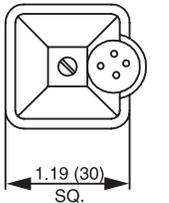
Supplied with 12 inch long 18 gauge 4-conductor cable



MS5/MS5LC

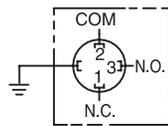


MS5T/MS5LCT

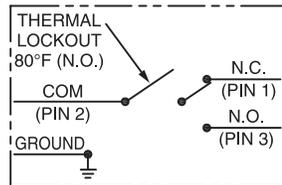


**MS10
MS10LC
MS10T
MS10LCT**

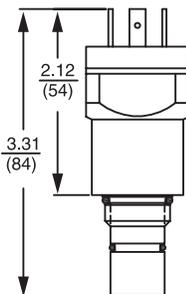
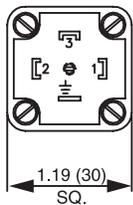
Supplied with DIN connector (male end only) (conforming to DIN 43650)



MS10/MS10LC



MS10T/MS10LCT

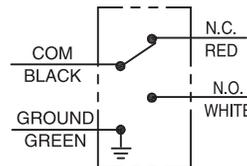


Model Codes of MSHA Version of MS10 are MS10DCM and MS10DCCM (DC only; second C designates cap). For electrical and dimensional drawings, contact factory.

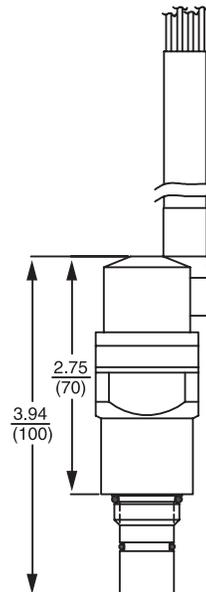
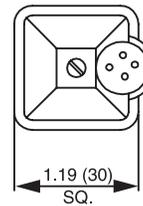


MS11

Supplied with 12 inch long 18 gauge 4-conductor cable



MS11



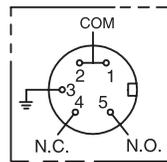
Appendix A Filter Dirt Alarm® Selection: Step 1

Electrical and
Electrical with
Thermal Lockout
(cont'd.)

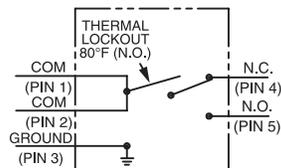


**MS12
MS12LC
MS12T
MS12LCT**

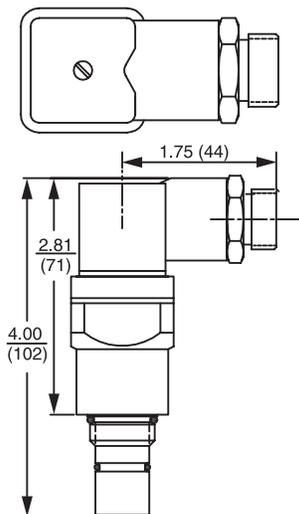
Supplied with 5 pin
Brad Harrison connector
(male end only)



MS12/MS12LC

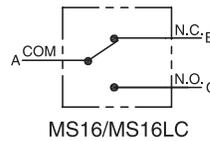


MS12T/MS12LCT

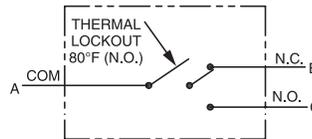


**MS16
MS16LC
MS16T
MS16LCT**

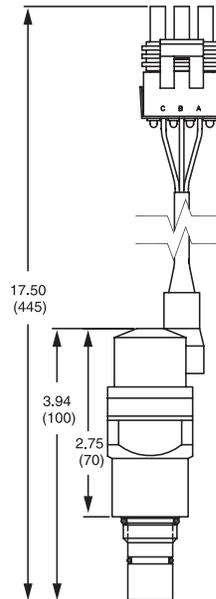
Supplied with a female
(3) contact weather-packed
sealed connector supplied with
DIN connector (male end only)
(conforming to DIN 43650)



MS16/MS16LC

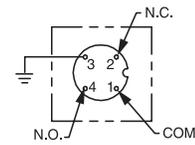


MS16T/MS16LCT

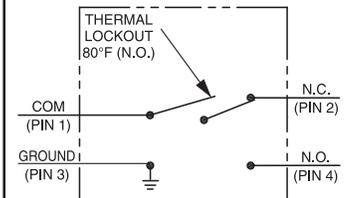


**MS17LC
MS17LCT**

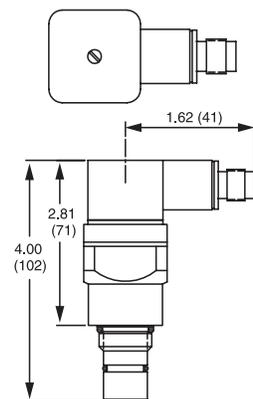
Supplied with a 4 pin
Brad Harrison "micro" connector
(male end only)



MS17LC



MS17LCT



Model Codes of MSHA Version of MS12
are MS12DCM and MS12DCCM (DC only;
second C designates cap). For electrical and
dimensional drawings, contact factory.

Filter Dirt Alarm® Selection: Step 1

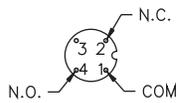
Appendix A



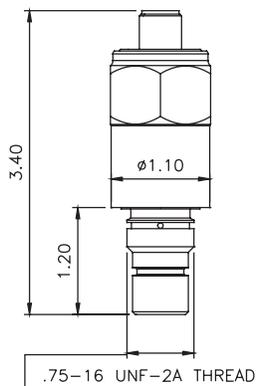
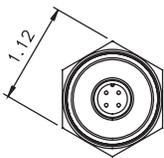
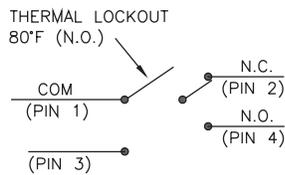
**MS17
MS17T**

Supplied with a 4 pin M12 "micro" connector (male end only) (confirming to IEC 60947-5-2)

NORMAL OPERATING PRESSURE ELECTRICAL SCHEMATIC



WITH THERMAL LOCKOUT



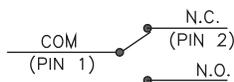
.75-16 UNF-2A THREAD



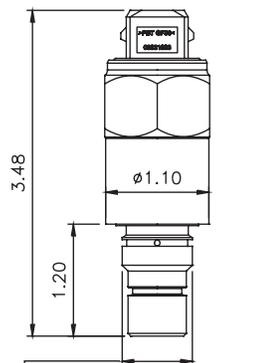
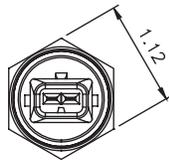
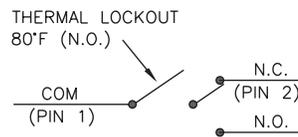
**MS18
MS18LC
MS18T
MS18LCT**

Supplied with a 2 pin amp junior power timer connector (male end only) (must designate N.O. or N.C.)

NORMAL OPERATING PRESSURE ELECTRICAL SCHEMATIC



WITH THERMAL LOCKOUT



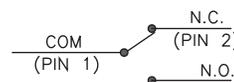
.75-16 UNF-2A THREAD



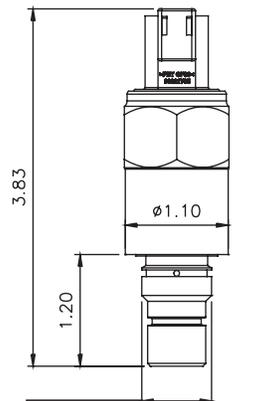
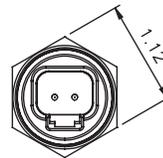
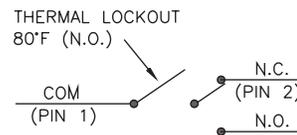
**MS19
MS19LC
MS19T
MS19LCT**

Supplied with a 2 pin deutsch connector (D04-2-P, male end only) (must designate N.O. or N.C.)

NORMAL OPERATING PRESSURE ELECTRICAL SCHEMATIC



WITH THERMAL LOCKOUT



.75-16 UNF-2A THREAD

Electrical and
Electrical with
Thermal Lockout
(cont'd.)

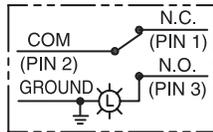
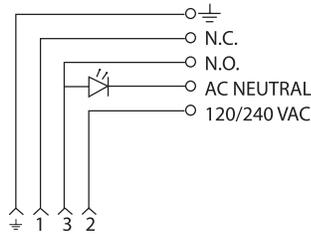
Appendix A Filter Dirt Alarm® Selection: Step 1

Electrical Visual
and
Electrical Visual
with
Thermal Lockout

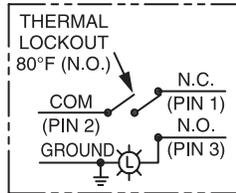


**MS13DC, MS13DCLC
MS13DCT, MS13DCLCT**

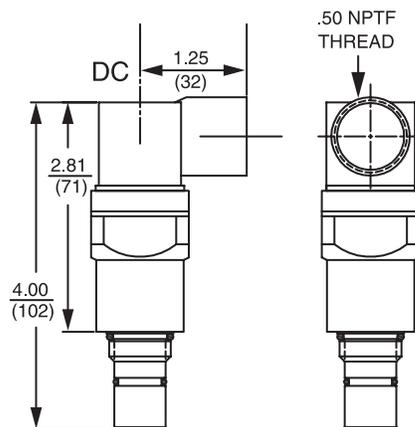
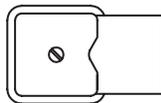
Supplied with
threaded connector
with light



MS13DC / MS13DCLC

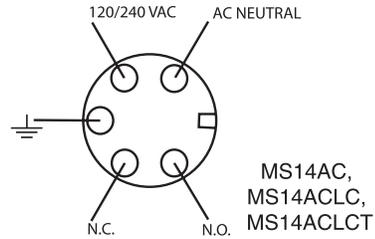


MS13DCT / MS13DCLCT

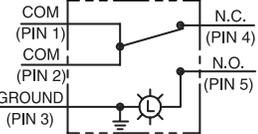
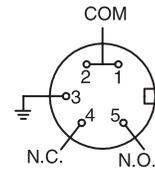


**MS14AC, MS14ACL, MS14ACLCT
MS14DC, MS14DCLC
MS14DCT, MS14DCLCT**

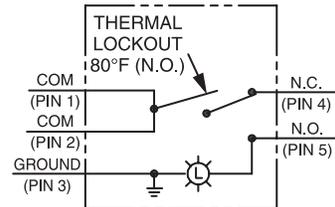
Supplied with
5 pin
Brad Harrison connector
with light
(male end only)



MS14AC,
MS14ACL,
MS14ACLCT



MS14DC / MS14DCLC



MS14DCT / MS14DCLCT

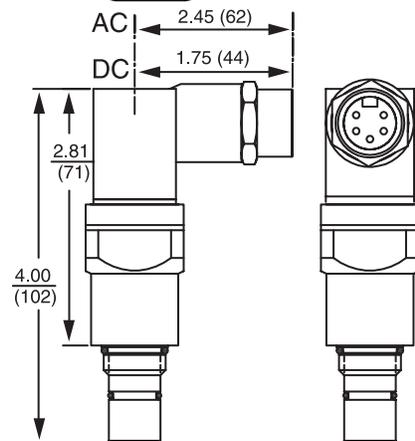
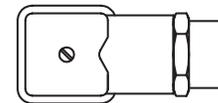


CHART 5 Electrical Ratings: Electrical Cartridge Indicators Without Thermal Lockout

| Voltage | Voltage Volts@ Amps | Current Range (amps) | MS5 | MS5LC | MS10 | MS10LC | MS11 | MS12 | MS12LC | MS13DC | MS13DCLC | MS14DC | MS14DCLC | MS15DC | MS16 | MS16LC | MS17 | MS17LC | MS14AC | MS14ACL | MS18 | MS18LC | MS19 | MS19LC |
|---------|---------------------|----------------------|-----|-------|------|--------|------|------|--------|--------|----------|--------|----------|--------|------|--------|------|--------|--------|---------|------|--------|------|--------|
| AC | 240 @ 3 | 0.02 to 3 | ✓ | | ✓ | | ✓ | ✓ | | | | | | | | | | ✓ | | | | | | |
| AC | 220 @ 0.05 | 0.005 to 0.05 | | ✓ | | ✓ | | | ✓ | | | | | | | | | | | | | ✓ | | ✓ |
| AC | 120 @ 5 | 0.02 to 5 | ✓ | | ✓ | | ✓ | ✓ | | | | | | | | | | | | | | | | |
| AC | 120 @ 0.05 | 0.005 to 0.05 | | ✓ | | ✓ | | | ✓ | | | | | | | | | | | ✓ | | ✓ | | ✓ |
| AC | 24 @ 0.10 | 0.005 to 0.010 | | ✓ | | ✓ | | | ✓ | | | | | | | | | | | ✓ | | ✓ | | |
| AC | 12 @ 0.25 | 0.005 to 0.025 | | ✓ | | ✓ | | | ✓ | | | | | | | | | | | ✓ | | | | |
| AC | 120 @ 4 | 0.05 to 4 | | | | | | | | | | | | | | | | | ✓ | | | | | |
| AC | 115 @ 0.05 | 0.01 to 0.05 | | | | | | | | | | | | | | | ✓ | | | | ✓ | | ✓ | |
| DC | 110 @ 0.3 | 0.02 to 0.3 | ✓ | | ✓ | | ✓ | ✓ | | | | | | | ✓ | | ✓ | | | | ✓ | | ✓ | |
| DC | 110 @ 0.05 | 0.005 to 0.05 | | ✓ | | ✓ | | | ✓ | | | | | | | ✓ | | ✓ | | | | ✓ | | ✓ |
| DC | 24 @ 3 | 0.01 to 3 | | | | | | | | | | | | | | | | | | | ✓ | | ✓ | |
| DC | 24 @ 2 | 0.02 to 2 | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ | | | ✓ | | | | | | | | | |
| DC | 24 @ 1 | 0.01 to 1 | | | | | | | | | | | | | | | ✓ | | | | | | | |
| DC | 24 @ 0.20 | 0.0 to 0.20 | | | | | | | | | | | | ✓ | | | | | | | | | | |
| DC | 24 @ 0.10 | 0.005 to 0.10 | | ✓ | | ✓ | | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | | | ✓ | | ✓ |
| DC | 12 @ 5 | 0.01 to 5 | | | | | | | | | | | | | | | | | | | ✓ | | ✓ | |
| DC | 12 @ 2 | 0.02 to 2 | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ | | | ✓ | | | | | | | | ✓ | |
| DC | 12 @ 1 | 0.01 to 1 | | | | | | | | | | | | | | | ✓ | | | | | | | |
| DC | 12 @ 0.25 | 0.005 to 0.25 | | ✓ | | ✓ | | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | | | ✓ | | ✓ |

CHART 6 Electrical Ratings: Electrical Cartridge Indicators With Thermal Lockout*

| Voltage | Voltage Volts @ Amps | Current Range (amps) | MS5T | MS5LCT | MS10T | MS10LCT | MS12T | MS12LCT | MS13DCT | MS13DCLCT | MS14DCT | MS14DCLCT | MS16T | MS16LCT | MS17 | MS17T | MS17LCT | MS14ACT | MS14ACLCT | MS18 | MS18T | MS18LCT | MS19 | MS19T | MS19LCT |
|---------|----------------------|----------------------|------|--------|-------|---------|-------|---------|---------|-----------|---------|-----------|-------|---------|------|-------|---------|---------|-----------|------|-------|---------|------|-------|---------|
| AC | 120 @ 5 | 0.02 to 5 | ✓ | | ✓ | | ✓ | | | | | | | | | | | | | | | | | | |
| AC | 220 @ 0.05 | 0.005 to 0.05 | | ✓ | | ✓ | | ✓ | | | | | | | | | | | ✓ | | | ✓ | | | ✓ |
| AC | 120 @ 5 | 0.05 to 4 | | | | | | | | | | | | | | | | ✓ | | | | | | | |
| AC | 115 @ 0.05 | 0.01 to 0.05 | | | | | | | | | | | | | ✓ | | | | | | ✓ | | | ✓ | |
| DC | 24 @ 2 | 0.02 to 2 | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | | ✓ | | | | | ✓ | | ✓ | | ✓ |
| DC | 24 @ 0.10 | 0.005 to 0.10 | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | | ✓ | | | | | ✓ | | ✓ | |
| DC | 12 @ 2 | 0.02 to 2 | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | | ✓ | | | | | ✓ | | ✓ | | ✓ |
| DC | 12 @ 0.25 | 0.005 to 0.25 | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | | ✓ | | | | | ✓ | | ✓ | |

*Thermal lockout prevents activation below 80°

Note: All indicators in Charts 4 and 5 above, meet NEMA4X and IP65 specifications.