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STRUMENTI MECCANICI



La strumentazione meccanica pur essendo stata ampiamente sostituita da quella elettrica e, più recentemente, da quella elettronica, rappresenta, ancor oggi, la soluzione ideale per alcune applicazioni dove viene preferita per la sua semplicità d'installazione, la sua robustezza, l'assenza di alimentazione elettrica, l'affidabilità e la precisione.

Da quando Frank W. Murphy inventò, nell'ormai lontano 1939, il primo strumento meccanico con contatto per rispondere all'allora diffusa richiesta di una semplice ed affidabile protezione motore, la società da lui fondata ha continuato a proporre un'ampia gamma di strumenti meccanici apprezzati e largamente utilizzati in tutto il mondo.

Termometri meccanici SWICHGAGE®

Serie 20 e 25



2 and 2-1/2 in. (51 and 64 mm) Dial

- Combination Indicating Gage and Limit Switch
- Critical/High Temperature Limit Switch Is Visible and Adjustable (Most Models)
- Switch Can Activate Alarms and/or Shut Down Equipment
- Contact Grounds Through Case



Description

The 20 Series (2 inch/51 mm dial) and the 25 Series (2-1/2 inch/64 mm dial) SWICHGAGE® models are diaphragm-actuated, temperature-indicating gages, with built-in electrical switches for tripping alarms and/or shutdown devices.

Ranges are available from 32-120°F (0-45°C) thru 300-440°F (160-220°C).

The gage mechanism is enclosed in a steel case coated to resist corrosion. A polycarbonate, break-resistant lens and a polished, stainless steel bezel help protect this rugged, built-to-last instrument.

These vapor actuated gages feature a sealed capillary tube and a sensing bulb. When subjected to heat, the liquid in the sensing bulb changes to vapor creating pressure against the diaphragm mechanism. The diaphragm translates this vapor pressure into a mechanical gage reading.

For series 20T and 25T, the gage pointer acts as a temperature indicator and as one switch pole which completes a circuit when it touches the adjustable limit contact. Contact(s) are grounded through the SWICHGAGE® case. They have self-cleaning motion to enhance electrical continuity.

Models 20TE and 25TE have internal snap-acting SPDT switches.

Gage-only models, without contacts (MURPHYGAGE®) are also available.

Applications

Industrial engines and equipment in Oil Field, Marine, Irrigation, Construction and Trucking industries. Monitoring Engine Coolant, Crankcase Oil, Transmission Oil.

Specifications

Dial: White on black; U.S.A. standard scale is dual scale °F/°C; others available (see How to Order).

Case: Plated steel; mounting clamp included (except for direct mounting models).

Bezel: Polished stainless steel, standard; others are available (see How to Order).

Pointer: Tempered nickel silver.

Lens: Polycarbonate, high-impact.

Sensing Element: Beryllium copper diaphragm.

Capillary: PVC armored copper; 4 ft. (1.2 m)* Galvanized and stainless steel armor optional.

Sensing Bulb: Copper*

Gage Accuracy: See accuracy chart, on page 2.

Maximum Temperature: See Temperature Ranges and Factory Settings table on page 2.

Adjustable Limit Contact (20T and 25T):

SPST contact; pilot duty only, 2 A @ 30 VAC/VDC; Ground path through encasement. Normally Closed (NC) when the high limit is met. Normally Open (NO) when pointer is in normal operating range. Contacts are gold flashed silver.

Limit Contact Adjustment: *by a 1/16 in. hex wrench thru 100% of the scale.*

Limit Contact Wire Leads: 18 AWG (1.0 mm²) x 12 in. (305 mm).

Snap-Switch Rating (20TE and 25TE):

SPDT, 3 A @ 30 VDC inductive; 4 A @ 125 VAC inductive.

Snap-Switch Wire Leads: 20 AWG (0.75 mm²) x 12 in. (305 mm).

Unit Weight: 20 Series: 12.7 oz. (0.39 kg).

25 Series Models: 13.8 oz. (0.43 kg).

Unit Dimensions: 20 Series: 4-3/4 x 4-3/4 x 2-3/4 in.

(121 x 121 x 70 mm). 25 Series Models: 4-3/4 x 4-3/4 x 3 in. (121 x 121 x 76 mm).

Base Models

Coolant or Oil Temperature

20T and 25T Series SWICHGAGE®

For these models the gage pointer makes with an adjustable contact to complete a pilot-duty circuit.

20TL and 25TL SWICHGAGE®

For use on Ford Worldwide engines. Supplied with special sensing bulb.

20TO SWICHGAGE®

Same as 20T with a special dial for Oil Temperature.

20TE and 25TE SWICHGAGE®

20TE (was 20ESR) and 25TE (was 25ESR). Models with internal SPDT snap-switches, instead of the single pole/pointer contact(s). When the switch closes on rising temperature, it becomes Set. As temperature decreases the switch Resets.

20TABS and 25TABS SWICHGAGE®

Same as 20/25T with internal SPDT snap-switch for pre-alarm.

Cylinder Head Temperature

20TH and 25TH SWICHGAGE®

20TH (was 20TL8133) and 25TH (was 25TL8133). For use on Air Cooled engines.

Direct Mount Models

20TD SWICHGAGE®

Same as 20T. Available ranges: 220°F (104°C) or 250°F (121°C). Includes 1/4 x 4 in. (6 x 102 mm) sensing bulb.

20SD SWICHGAGE®

Same as 20T. Available ranges: 220°F (104°C) or 250°F (121°C). Includes 11/32 x 1-1/2 in. (9 x 38 mm) sensing bulb.

Gage-Only Models

20TG and 25TG MURPHYGAGE®

Gages without contact(s).

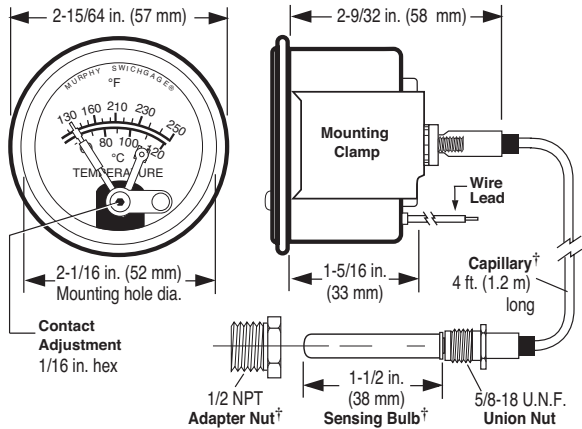
* For optional capillary lengths, engine adaptors, sensing bulbs and range combinations, see Murphy bulletin T-8428B.

** Products cover by this bulletin comply with EMC Council directive 89/336/EEC regarding electromagnetic compatibility as noted.

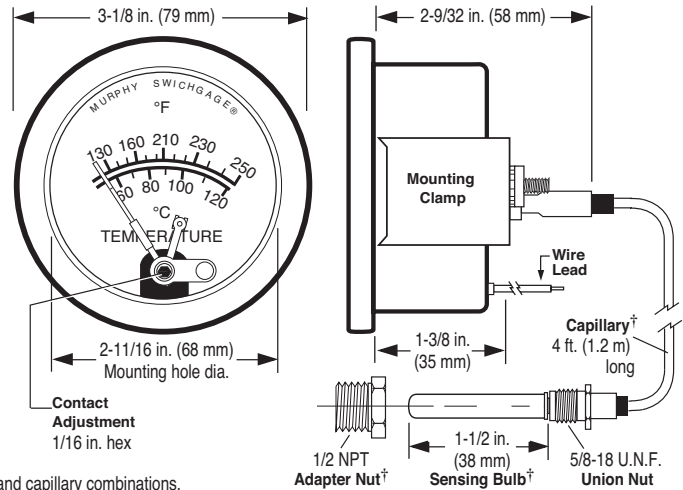


Dimensions

20 Series Models (typical)



25 Series Models (typical)



†Standard combinations. See Murphy bulletin T-8428B for optional sensing bulb, engine adaptors and capillary combinations.

Temperature Ranges and Factory Settings

NOTES

- Values in () are mathematical conversions from °F to °C—they do not reflect actual second scale range. U.S.A. standard scale is °F/°C.
- For models 20TE and 25TE; the switch trip point cannot be set at either the low or high extreme of the scale. The trip point must allow for the reset differential.
- For adjustable switch models, the trip point is adjustable **only** over the upper half of the scale.

Ranges Available		Max. Temp.	Std. Settings*		Hi/Lo Settings		20TABS and 25TABS Settings			
Dual Scale Dial °Fahrenheit (°Celsius)	Single Scale °Celsius only		°F (°C)	°F (°C)	°C only	Low °F (°C)	High °F (°C)	Alarm**		Shutdown
							°F (°C)	°C only	°F (°C)	°C only
32 – 120 (0 – 49)	—	185 (85)	110 (43)	—	32 (0)	110 (43)	100 (38)	—	110 (43)	—
32 – 160 (0 – 71)	0 – 70	215 (102)	150 (66)	66	32 (0)	150 (66)	140 (60)	60	150 (66)	66
130 – 220 (54 – 104)	45 – 100	260 (127)	210 (99)	85	160 (71)	210 (99)	200 (93)	80	210 (99)	85
130 – 250 (54 – 121)	50 – 120	310 (154)	210 (99)	97	160 (71)	210 (99)	200 (93)	95	210 (99)	100
140 – 300 (60 – 149)	60 – 140	340 (172)	275 (135)	130	200 (93)	275 (135)	265 (129)	125	275 (135)	130
160 – 320 (71 – 160)	70 – 160	370 (192)	300 (149)	150	200 (93)	300 (149)	290 (143)	145	300 (149)	150
180 – 350 (82 – 177)	—	400 (209)	330 (166)	—	240 (116)	330 (166)	320 (160)	—	330 (166)	—
300 – 440 (149 – 227)	—	500 (260)	400 (204)	—	300 (149)	400 (204)	390 (199)	—	400 (204)	—

* Standard setting for 20T, 25T, 20TE and 25TE models.

** SPDT snap-switch is the alarm switch.

Temperature Accuracy Chart

Temperature Range	Lower 1/3 of Scale	Middle 1/3 of Scale	Upper 1/3 of Scale
32 to 120°F (0 to 49°C)	± 12°F (± 6°C)	± 5°F (± 2.4°C)	± 6°F (± 3°C)
32 to 160°F (0 to 71°C)	± 20°F (± 10°C)	± 8°F (± 4.4°C)	± 7°F (± 4°C)
130 to 220°F (54 to 104°C)	± 6°F (± 3°C)	± 3°F (± 1.6°C)	± 4°F (± 2°C)
130 to 250°F (54 to 121°C)	± 9°F (± 5°C)	± 5°F (± 2.4°C)	± 4°F (± 2°C)
140 to 300°F (60 to 149°C)	± 10°F (± 5.2°C)	± 6°F (± 3°C)	± 5°F (± 2.4°C)
160 to 320°F (71 to 160°C)	± 10°F (± 5.2°C)	± 5°F (± 2.4°C)	± 5°F (± 2.4°C)
180 to 350°F (82 to 177°C)	± 12°F (± 6°C)	± 5°F (± 2.4°C)	± 5°F (± 2.4°C)
300 to 440°F (149 to 227°C)	± 9°F (± 5°C)	± 5°F (± 2.4°C)	± 4°F (± 2°C)

Maximum Temperature

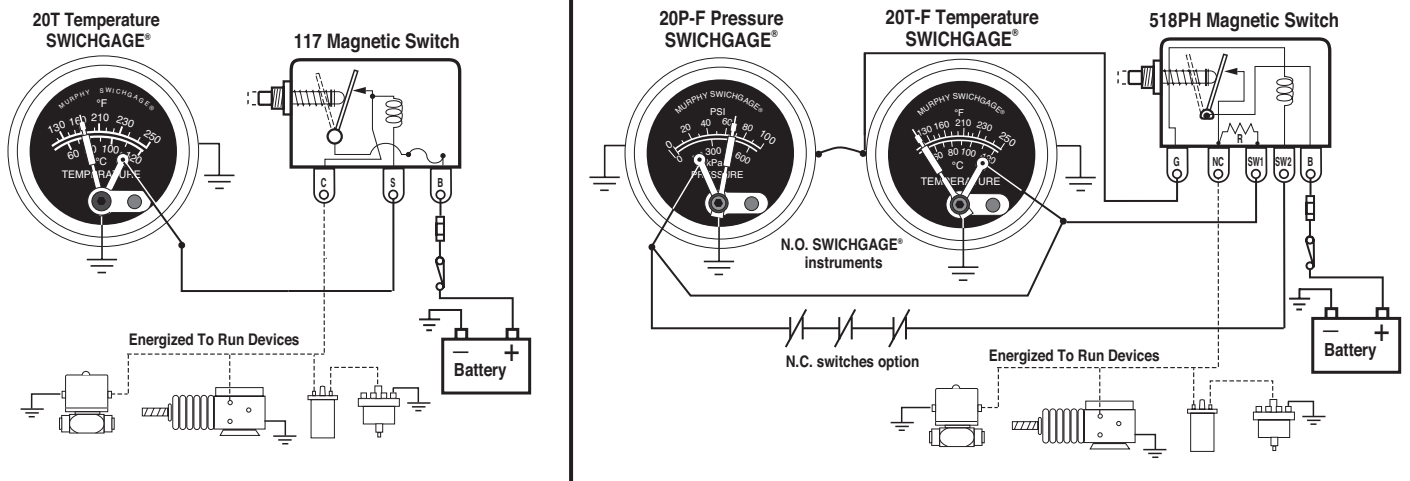
MAXIMUM AMBIENT TEMPERATURE: -40° (-40°) thru 150° (66°)

RANGE	MAXIMUM PROCESS TEMPERATURE
≤250° (120°)	120% OF FULL SCALE
300° (140°)	350° (198°)
≥320° (160°)	120% OF FULL SCALE

Magnetic Switch

INDUCTIVE AND HIGH CURRENT LOADS REQUIRE THE USE OF A MAGNETIC SWITCH. The SWICHGAGE® contacts are for light-duty electrical switching to operate alarms or control devices. Murphy manufactures the Magnetic Switch for protection of the light-duty SWICHGAGE® limit contacts.

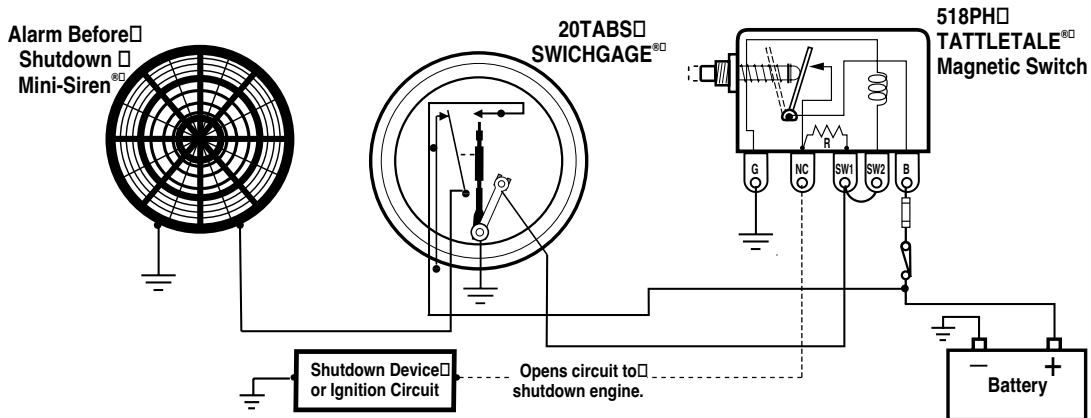
TATTLETALE® Magnetic Switches show the cause of shutdown for applications that include: capacitor discharge or magneto ignitions, battery systems and electric motor driven equipment. Typical wiring diagrams are shown below.



Pre-Alarm Using 20/25TABS

The 20TABS and 25TABS feature a standard limit contact for high temperature equipment shutdown. It also has an internal SPDT snap-switch to signal an alarm before shutting down. When the low side of the snap-switch trips (preset point), on rising temperature, the switch completes a circuit to activate an alarm. If the temperature continues to increase, the face-adjustable pointer contact will

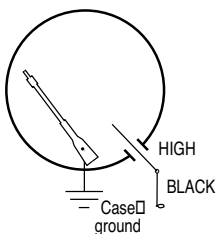
make and the shutdown circuit will be completed (see the typical diagram below for reference). The front contact shutdown limit setting (which is adjustable) and the snap-switch are preset at the factory. Refer to "Temperature Ranges and Factory Settings" table on opposite page for settings. For alternative alarm before shutdown, see Magnetic Switch model 760A or 761APH.



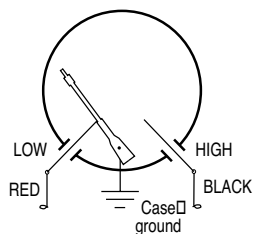
Typical Internal Wiring Diagrams

Pointer shown in the shelf position. Pointer type contact rating: pilot duty 2 A @ 30 VAC/VDC.
Snap-acting switch rating: 3 A @ 30 VDC inductive. 4 A @ 125 VAC inductive.

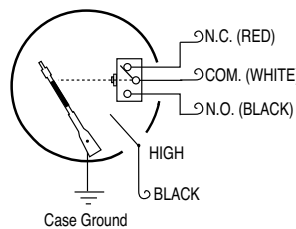
Pointer Type Contact



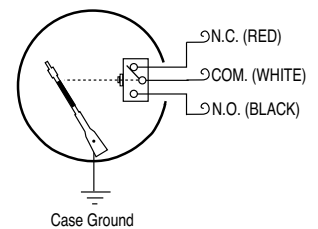
"HL" Hi-Lo Option



ABS Models



TE Models



How to Order

To order, use the diagram below. List options in ascending alphabetical order (A-Z). Example: **20T-IP1-250-4**.

Base Model		
20T	20TH	25TL
20TL	20TD	25TE
20TO	20SD	25TABS
20TE	20TG	25TH
20TABS	25T	25TG
20TB		

Options[†]
A = AGF (Argon filled)
B1 = Black bezel
B2 = Bezel 05051857 (was "HP")
B3 = Bezel 05051836 (was "HBB")
EX = EX proof (explosion proofed)
EL = EX less case (explosion proofed less case)
F = "FS" contact (includes "ES" as appropriate)
HL = High and low contacts
I = Illumination (for options, see chart below)
IP1 = Light pipe illumination, 12 VDC
IP2 = Light pipe illumination, 24 VDC
K = Knob adjusting face contact
OS = Oil sealed (Silicone Oil)
UA = Temperature bulb style A (10050166)*
UB = Temperature bulb style B (10010061)*
UC = Temperature bulb style C (10010060)*
UD = Temperature bulb style D (10000286)*
UE = Temperature bulb style E (10010084)*
UF = Temperature bulb style F (10000577)*
UG = Temperature bulb style G (10000578)*
UH = Temperature bulb style H (10002466)*
UK = Temperature bulb style K (10054886)*

[†] Options not available on all models or configurations.
^{*} Specify optional bulb ONLY when not included as standard for temperature **Base Model**, scale/range or capillary length.

Illumination Options		
	IP1 / IP2	I
20 Series	x	x¹
25 Series	N/A	N/A

¹Can be used with standard Clamp Lite Assembly (12 V= 05702176; 24 V= 05702177).

Adapter Nuts^{†††}	
1/8 = 1/8-27 NPT	Metric M10 = 10 mm x 1.5 M12 = 12 mm x 1.5 M14 = 14 mm x 1.5 M16 = 16 mm x 1.5 M18 = 18 mm x 1.5 M20 = 20 mm x 1.5 M22 = 22 mm x 1.5 M24 = 24 mm x 1.5
1/4 = 1/4-18 NPT	
3/8 = 3/8-18 NPT	
3/8B = 3/8-19 BSPT	
3/8K = 3/8 NPSF	
- = 1/2-14 NPT ^{††††}	
1/2B = 1/2-BSPT	
1/2K = 1/2 NPSF	
5/8 = 5/8-18 UNF	
3/4 = 3/4-14 NPT	
3/4U = 3/4-16 UNF	
7/8 = 7/8-9 UNC	

^{†††}Specific adapter nut must match the sensing bulb.
^{††††}Standard.

Temperature Capillary Armor Type and Length
Capillary Armor Type Blank = PVC armor, copper capillary S = Stainless steel armor, copper capillary
Capillary Length (specify after capillary type; example: "S4") 4 = 4 ft. (1.2 m) Specify other length = Available in 2 ft. increments thru 20 ft.; 5 ft. increments above 20 ft. (0.5 metres increments from 1.5–10 metres; 2 metre increments thru 34 metres. Specify "M" following length, i.e. 1.5M.)

Range^{††}		
Dual scale (°F/°C)	°F	°C
120	32-120	0-49
160	32-160	0-71
220	130-220	54-104
250	130-250	60-121
300	140-300	60-149
320	160-320	71-160
350	180-350	82-177
440	300-440	149-227

Single scale (°C)
70C = 0-70°C
100C = 45-100°C
120C = 50-120°C
140C = 60-140°C
160C = 70-160°C

^{††}Consult factory for availability of dials other than °F/°C. Select scale so your normal operating temperature is in the upper half of the scale.



Termometri meccanici SWICHGAGE®

Serie A20 e A25



A20T Series shown

2 and 2-1/2 in. (51 and 64 mm) Dial

- Corrosion Resistant Polycarbonate Case
- Indicating Gage and Limit Switch
- Switch Can Activate Alarms and/or Shut Down Equipment
- Critical/High Temperature Limit Switch Is Visible and Adjustable (Most Models)
- Contact(s) Isolated From Ground

Description

The A20 Series (2 inch/51 mm dial) and the A25 Series (2-1/2 inch/64 mm dial) SWICHGAGE® models are diaphragm-actuated, temperature-indicating gages, with built-in electrical switches for tripping alarms and/or shutdown devices.

Ranges are available from 32-120°F (0-45°C) thru 300-440°F (160-220°C).

All models of these rugged, built-to-last instruments are fully sealed from the environment by the unique combination of a polycarbonate case and lens, a polished stainless steel bezel, and O-ring seals.

These vapor/pressure actuated gages feature a sealed capillary tube and a sensing bulb. When subjected to heat, the liquid in the sensing bulb changes to vapor creating pressure against a diaphragm mechanism. The diaphragm translates this vapor pressure into a mechanical gage reading.

For series A20T and A25T, the gage pointer acts as a temperature indicator and as one switch pole which completes a circuit when it touches the adjustable limit contact. Contact(s) are isolated from ground. They have self-cleaning motion to enhance electrical continuity.

Models A20TE and A25TE have internal snap-acting SPDT switches.

Gage-only models, without contacts (MURPHYGAGE®) are also available.

Applications

Applications for A20 and A25 Series temperature SWICHGAGE® instruments include: engines and equipment in Oil Field, Marine, Irrigation, Construction and Trucking industries. Monitoring Engine Coolant temperature, Crankcase Oil, Transmission Oil.

Specifications

Dial: White on black; U.S.A. standard scale is dual scale °F/°C; others available.

Case: Glass filled/Polycarbonate, corrosion-resistant; steel mounting clamp included. **Bezel:** Polished stainless steel, standard; others are available.

Pointer: Tempered nickel silver; red tip.

Lens: Polycarbonate, high-impact.

Sensing Element: Beryllium copper diaphragm.

Capillary: PVC armored copper; 4 ft. (1.2 m)* Galvanized and stainless steel armor optional.

Sensing Bulb: Copper*

Gage Accuracy: See accuracy chart, on page 2.

Maximum Temperature: See Temperature Ranges and Factory Settings table on page 2.

Adjustable Limit Contact (A20T and A25T): SPST contact; pilot-duty only, 2 A @ 30 VAC/VDC; isolated from case ground. Normally Closed when the high limit is met. Normally Open when pointer is in normal operating range. Contacts are gold flashed silver.

Limit Contact Adjustment: *by a 1/16 in. hex wrench thru 100% of the scale.*

Wiring: A20T: *Number 4 screw terminals;*
A25T: *Number 6 screw terminals.*

Snap-Switch Rating (A20TE and A25TE): SPDT, 3 A @ 30 VDC inductive; 4 A @ 125 VAC inductive.

Wiring: A20TE: *Number 4 screw terminals;*
A25TE: *Number 6 screw terminals.*

Unit Weight: A20 Series: *11.9 oz. (0.370 kg).*
A25 Series Models: *13.3 oz. (0.413 kg).*

Unit Dimensions: A20 Series: *4-3/4 x 4-3/4 x 3 in. (121 x 121 x 76 mm).* A25 Series Models: *4-3/4 x 4-3/4 x 2-3/4 in. (121 x 121 x 70 mm).*

Base Models

Coolant or Oil Temperature

A20T and A25T Series SWICHGAGE®

For these models the gage pointer makes with an adjustable contact to complete a pilot-duty circuit.

A20TL and A25TL SWICHGAGE®

For use on Ford Worldwide engines. Supplied with special sensing bulb.

A20TE and A25TE SWICHGAGE®

A20TE (*was A20ESR*) and A25TE (*was A25ESR*). Models with internal SPDT snap-switches, instead of the single pole/pointer contact(s). When the switch closes on rising temperature, it becomes Set. As temperature decreases the switch Resets.

Model A25TE is CSA listed for non-hazardous areas. Model A25TE-EX is CSA listed for Class I, Division 1, Groups C & D hazardous areas.



A20TABS and A25TABS SWICHGAGE®

Same as 20 and 25T with internal SPDT snap-switch for pre-alarm.

Cylinder Head Temperature

A20TH and A25TH SWICHGAGE®

A20TH (*was A20TL8133*) and A25TH (*was A25TL8133*). For use on Air Cooled engines.

Gage-Only Models

A20TG and A25TG MURPHYGAGE®

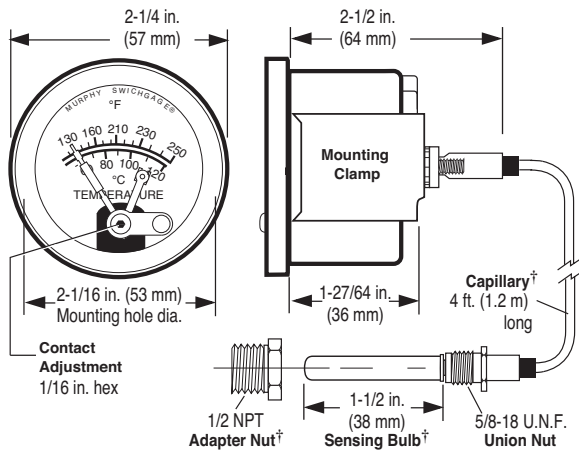
Gage without contact(s).

* For optional capillary lengths, engine adapters, sensing bulbs and range combinations, see Murphy bulletin T-8428B.

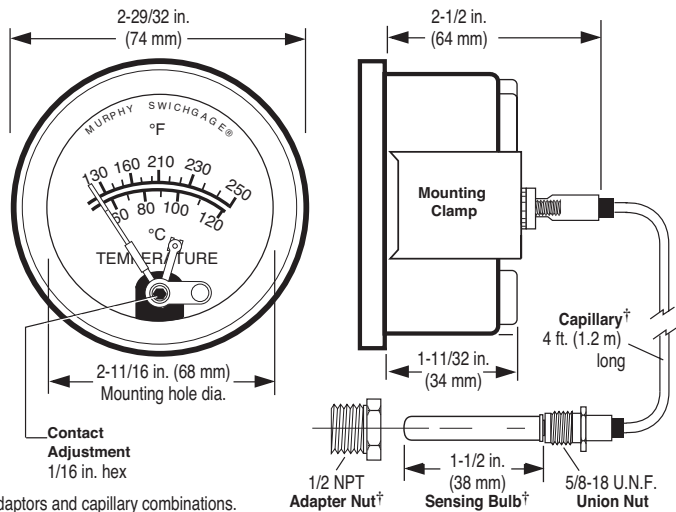
** Products covered by this bulletin comply with EMC Council directive 89/336/EEC regarding electromagnetic compatibility except as noted.

Dimensions

A20 Series Models (typical)



A25 Series Models (typical)



†Standard combinations. See Murphy bulletin T-8428B for optional sensing bulb, engine adaptors and capillary combinations.

Temperature Ranges and Factory Settings

NOTES

- Values in () are mathematical conversions from °F to °C—they do not reflect actual second scale range. U.S.A. standard scale is °F/°C.
- For models A20TE and A25TE; the switch trip point cannot be set at either the low or high extreme of the scale. The trip point must allow for the reset differential.
- For adjustable switch models, the trip point is adjustable **only** over the upper half of the scale.

Ranges Available		Max. Temp.	Std. Settings*		Hi/Lo Settings		20TABS and 25TABS Settings			
Dual Scale Dial °Fahrenheit (°Celsius)	Single Scale °Celsius only		°F (°C)	°F (°C) °C only	Low °F (°C)	High °F (°C)	Alarm**		Shutdown	
							°F (°C)	°C only	°F (°C)	°C only
32 – 120 (0 – 49)	—	185 (85)	110 (43) —	—	32 (0)	110 (43)	100 (38)	—	110 (43)	—
32 – 160 (0 – 71)	0 – 70	215 (102)	150 (66) 66	66	32 (0)	150 (66)	140 (60)	60	150 (66)	66
130 – 220 (54 – 104)	45 – 100	260 (127)	210 (99) 85	85	160 (71)	210 (99)	200 (93)	80	210 (99)	85
130 – 250 (54 – 121)	50 – 120	310 (154)	210 (99) 97	97	160 (71)	210 (99)	200 (93)	95	210 (99)	100
140 – 300 (60 – 149)	60 – 140	340 (173)	275 (135) 130	130	200 (93)	275 (135)	265 (129)	125	275 (135)	130
160 – 320 (71 – 160)	70 – 160	370 (192)	300 (149) 150	150	200 (93)	300 (149)	290 (143)	145	300 (149)	150
180 – 350 (82 – 177)	—	400 (209)	330 (166) —	—	240 (116)	330 (166)	320 (160)	—	330 (166)	—
300 – 440 (149 – 227)	—	500 (260)	400 (204) —	—	300 (149)	400 (204)	390 (199)	—	400 (204)	—

* Standard setting for A20T, A25T, A20TE and A25TE models.

** SPDT snap-switch is the alarm switch.

Temperature Accuracy Chart

Temperature Range	Lower 1/3 of Scale	Middle 1/3 of Scale	Upper 1/3 of Scale
32 to 120°F (0 to 49°C)	± 12°F (± 6°C)	± 5°F (± 2.4°C)	± 6°F (± 3°C)
32 to 160°F (0 to 71°C)	± 20°F (± 10°C)	± 8°F (± 4.4°C)	± 7°F (± 4°C)
130 to 220°F (54 to 104°C)	± 6°F (± 3°C)	± 3°F (± 1.6°C)	± 4°F (± 2°C)
130 to 250°F (54 to 121°C)	± 9°F (± 5°C)	± 5°F (± 2.4°C)	± 4°F (± 2°C)
140 to 300°F (60 to 149°C)	± 10°F (± 5.2°C)	± 6°F (± 3°C)	± 5°F (± 2.4°C)
160 to 320°F (71 to 160°C)	± 10°F (± 5.2°C)	± 5°F (± 2.4°C)	± 5°F (± 2.4°C)
180 to 350°F (82 to 177°C)	± 12°F (± 6°C)	± 5°F (± 2.4°C)	± 5°F (± 2.4°C)
300 to 440°F (149 to 227°C)	± 9°F (± 5°C)	± 5°F (± 2.4°C)	± 4°F (± 2°C)

Maximum Temperature

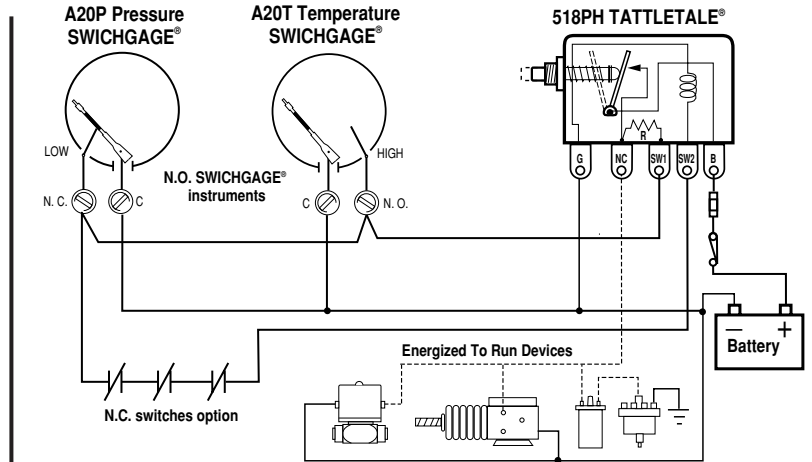
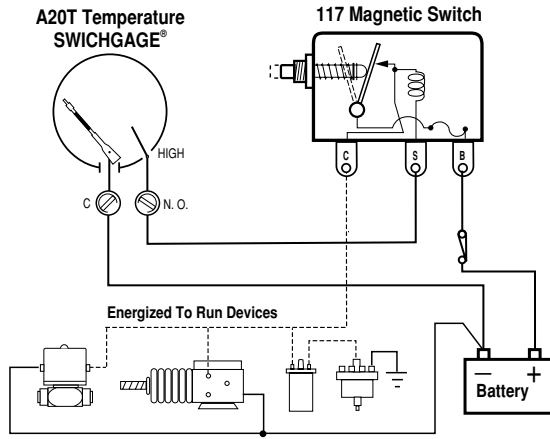
MAXIMUM AMBIENT TEMPERATURE: -40° (-40°) thru 150° (66°)

RANGE	MAXIMUM PROCESS TEMPERATURE
≤250° (120°)	120% OF FULL SCALE
300° (140°)	350° (198°)
≥320° (160°)	120% OF FULL SCALE

Magnetic Switch

INDUCTIVE AND HIGH CURRENT LOADS REQUIRE THE USE OF A MAGNETIC SWITCH. The SWICHGAGE® contacts are for light-duty electrical switching to operate alarms or control devices. Murphy manufactures the Magnetic Switch for protection of the pilot-duty SWICHGAGE® limit contacts.

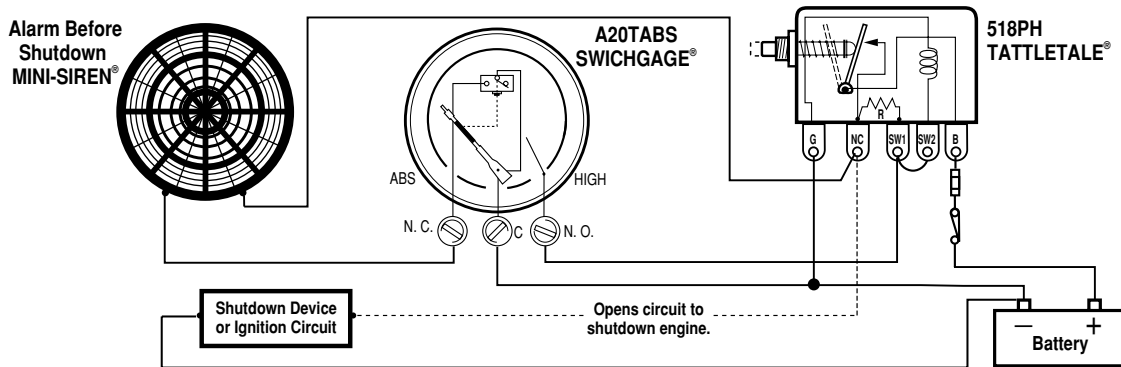
TATTLETALE® Magnetic Switches show the cause of shutdown for applications that include: capacitor discharge or magneto ignitions, battery systems and electric motor driven equipment. Typical wiring diagrams are shown below.



Pre-Alarm Using A20/A25TABS

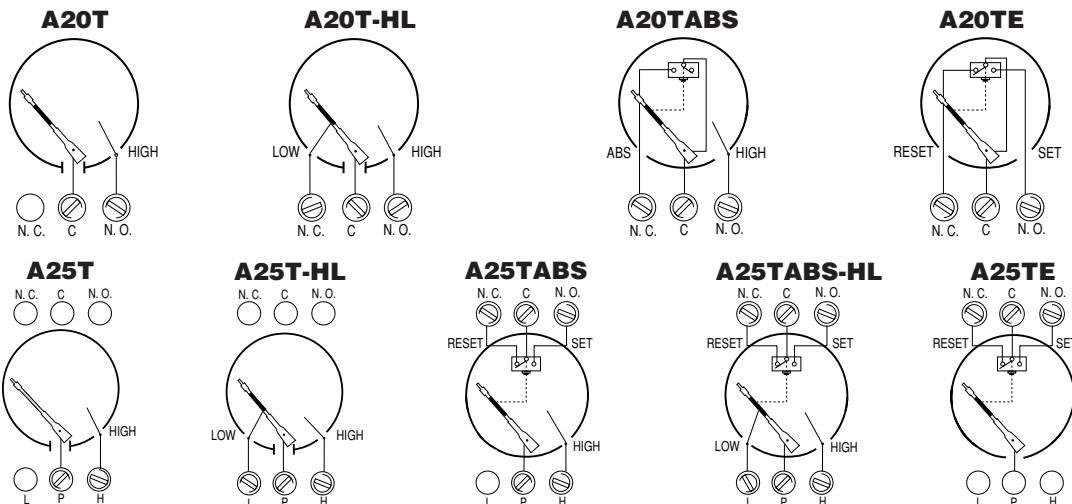
The A20TABS and A25TABS features a standard limit contact for equipment shutdown on high temperature. It also has an internal SPDT snap-switch to signal an alarm before shutting down. When the snap-switch trips (preset point), on rising temperature, the switch completes a circuit to activate an alarm. If the temperature continues to increase, the face-adjustable pointer contact will make

and the shutdown circuit will be completed (see the typical diagram below for reference). The front contact shutdown limit setting (which is adjustable) and the snap-switch are preset at the factory. Refer to "Temperature Ranges and Factory Settings" table on opposite page for settings. For alternative alarm before shutdown, see Magnetic Switch model 760A or 761APH.



Typical Internal Wiring Diagrams

Pointer shown in the shelf position. Pointer type contact rating: pilot-duty 2 A @ 30 VAC/VDC resistive. Snap-acting switch rating: 3 A @ 30 VDC inductive. 4 A @ 125 VAC inductive.



How to Order

To order, use the diagram below. List options in ascending alphabetical order (A-Z). Example: **A20T-B1-250-4**.

Base Model	
A20T	A20TG
A20TL	A25T
A20TO	A25TL
A20TE	A25TE
A20TABS	A25TABS
A20TB	A25TH
A20TH	A25TG

Options[†]
B1 = Black bezel
EX = Explosion-proof (CSA Listed for Class I, Div. 1, Groups C & D)*
EL = Explosion-proof less case
HL = High and low contacts
K = Knob adjusting face contact
OS = Oil sealed (Silicone Oil)
UA = Temperature bulb style "A" (10-05-0166)
UB = Temperature bulb style "B" (10-01-0061)
UC = Temperature bulb style "C" (10-01-0060)
UD = Temperature bulb style "D" (10-00-0286)
UE = Temperature bulb style "E" (10-01-0084)
UF = Temperature bulb style "F" (10-00-0577)
UG = Temperature bulb style "G" (10-00-0578)
UH = Temperature bulb style "H" (10-00-2466)
UJ = Temperature bulb style J (10051153)
UK = Temperature bulb style K (10054886)
[†] Options not available on all models or configurations.
*A25TE-EX only is CSA listed for hazardous locations.
**This option is not covered by the CE mark.

Adapter Nuts^{†††}		
1/8 = 1/8-27 NPT	Metric M10 = 10 mm x 1.5 M12 = 12 mm x 1.5 M14 = 14 mm x 1.5 M16 = 16 mm x 1.5 M18 = 18 mm x 1.5 M20 = 20 mm x 1.5 M22 = 22 mm x 1.5 M24 = 24 mm x 1.5	
1/4 = 1/4-18 NPT		
3/8 = 3/8-18 NPT		
3/8B = 3/8-19 BSPT		
3/8K = 3/8 NPSF		
- = 1/2-14 NPT ^{††††}		
1/2B = 1/2-BSPT		
1/2K = 1/2 NPSF		
5/8 = 5/8-18 UNF		
3/4 = 3/4-14 NPT		
3/4U = 3/4-16 UNF		
7/8 = 7/8-9 UNC		
^{†††} Specific adapter nut must match the sensing bulb. ^{††††} Standard.		

Temperature Capillary Armor Type and Length
Capillary Armor Type Blank = PVC armor, copper capillary S = Stainless steel armor, copper capillary
Capillary Length (specify after capillary type; example: "S4") 4 = 4 ft. (1.2 m) Specify other length = Available in 2 ft. increments thru 20 ft.; 5 ft. increments above 20 ft. (0.5 m. increments from 1.5-10 m.; 2 m. increments thru 34 m. Specify "M" following length, i.e. 1.5M.)

Range^{††}		
Dual scale (°F/°C)	°F	°C
120 = 32-120	0-49	Single scale (°C) 70C = 0-70°C 100C = 45-100°C 120C = 50-120°C 140C = 60-140°C 160C = 70-160°C
160 = 32-160	0-71	
220 = 130-220	54-104	
250 = 130-250	60-121	
300 = 140-300	60-149	
320 = 160-320	71-160	
350 = 180-350	82-177	
440 = 300-440	149-227	
^{††} Consult factory for availability of dials other than °F/°C. Select scale so your normal operating temperature is in the upper half of the scale.		

Illumination – Order Separately

A20 Series: Clamp Lite Assembly; 12 V= 05702176; 24 V= 05702177

A25 Series: N/A.



Manometri SWICHGAGE Serie 20 e 25



2 and 2-1/2 in. (51 and 64 mm) Dial

- Combination Indicating Gage and Limit Switch
- Critical Pressure Limit Switch Is Visible and Adjustable (Most Models)
- Switch Can Activate Alarms and/or Shutdown Equipment
- Exceeds SAE Standards

Description

The 20 Series (2 inch/51 mm dial) and the 25 Series (2-1/2 inch/64 mm dial) SWICHGAGE® models are diaphragm-actuated, pressure-indicating gages, with built-in electrical switches. These switches are used for tripping alarms and/or shutdown devices.

Ranges are available from 0-15 psi (103 kPa) [1.0 bar] thru 0-400 psi (2.8 MPa) [28 bar].

The gage mechanism is enclosed in a steel case coated to resist corrosion. A polycarbonate, break-resistant lens and a polished, stainless steel bezel help protect this rugged, built-to-last instrument. Accuracy and protection from moderate overpressure is assured by a unique, unitized diaphragm chamber. A built-in pulsation dampener helps eliminate pointer flutter and is removable for cleaning.

For models 20P and 25P, the gage pointer acts as a pressure indicator and as one switch pole which completes a circuit when it touches the adjustable limit contact. Contacts are grounded through the SWICHGAGE® case and have self-cleaning motion to ensure electrical continuity.

Models 20PE and 25PE have internal snap-acting SPDT switches.

Gage-only models, without the switches (MURPHYGAGE®) are also available.

Applications

The SWICHGAGE® was specifically designed to protect engines/equipment in Oil Field, Marine, Irrigation, Construction and Trucking applications to monitor Engine Lube Pressure, Water Pump Pressure, Hydraulic Pressure, Air Pressure, etc.

Specifications

Dial: White on black, dual scale; U.S.A. standard scale is psi/kPa; U.K. standard scale is psi/bar; others available (see How to Order).

Case: Plated steel; mounting clamp included (except for direct mount models).

Bezel: Polished stainless steel, standard; others are available (see How to Order).

Lens: Polycarbonate, high-impact.

Oil: Silicon Oil.

Temperature Range:

Ambient: -40°F (-40°C) thru 150°F (66°C).

Process: -40°F (-40°C) thru 250°F (121°C).

Process Connection: 1/8-27 NPTM brass.

Sensing Element: Beryllium copper diaphragm.

Gage Accuracy (% of Full Scale):

RANGE	LOWER 1/4	MIDDLE 1/2	UPPER 1/4
≤300 psi (20 Bar)	±3%	±2%	±3%
400 psi (28 Bar)	±3%	±3%	±5%

Maximum Pressure: See Pressure Ranges and Factory Settings table on page 2.

Adjustable Limit Contact (20P and 25P):

SPST contact; pilot-duty only, 2 A @ 30 VAC/DC;

Normally Close (NC) when the low limit is met.

Normally Open (NO) when pointer is in normal operating range. Contacts are gold flashed silver.

Limit Contact Adjustment: *by a 1/16 in. hex wrench thru 100% of the scale.*

Limit Contact Wire Leads: 18 AWG (1.0 mm²) x 12 in. (305 mm).

Snap-Switch Rating (20PE and 25PE):

SPDT, 3 A @ 30 VDC inductive; 4 A @ 125 VAC inductive.

Snap-Switch Wire Leads: 20 AWG (0.75 mm²) x 12 in. (305 mm).

Unit Weight: 20 Series: 8 oz. (0.23 kg).

25 Series Models: 11 oz. (0.31 kg).

Unit Dimensions: 20 Series: 3 x 3 x 3 in. (76 x 76 x 76 mm). 25 Series Models: 4-3/4 x 4-3/4 x 2-3/4 in. (121 x 121 x 70 mm).

Base Models

20P and 25P Series SWICHGAGE®

The gage pointer makes with an adjustable contact to complete a pilot-duty circuit.

20PE and 25PE SWICHGAGE®

20PE (was 20EO) and 25PE (was 25EO).

Features internal snap-acting SPDT switches, instead of the single pole/pointer contacts. When the switch closes on falling pressure, it becomes Set, as pressure rises the switch Resets.

20PABS and 25PABS SWICHGAGE®

Same as 20P and 25P with internal SPDT snap-switch for pre-alarm.

20P7 and 25P7 Lockout SWICHGAGE®

Same as 20P and 25P Series. They also include a front, semi-automatic lockout for startup override. This built-in device holds the pointer away from the contact on startup. When pressure exceeds the set point, the lockout is automatically disengaged (see page 3 for details).

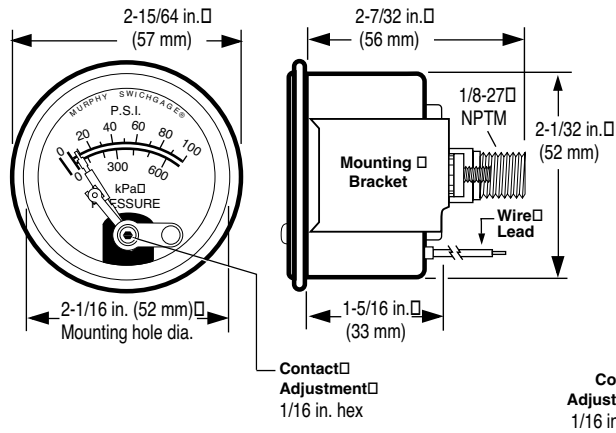
20PG and 25PG MURPHYGAGE®

Gage without contact(s).

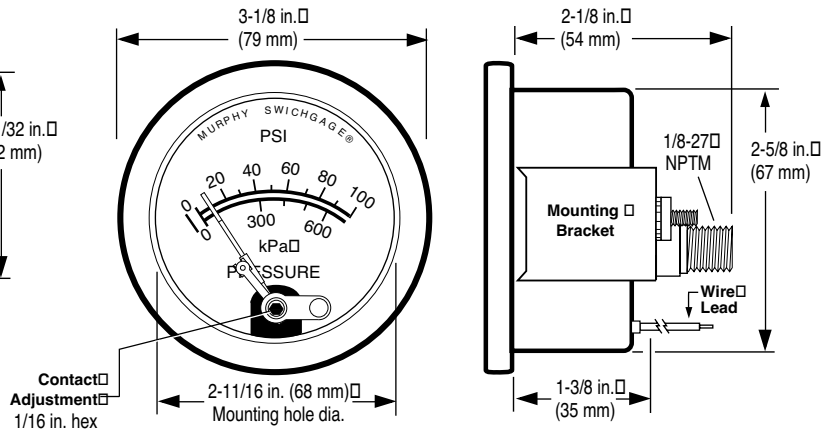
**Products covered by this bulletin comply with EMC Council directive 89/336/EEC regarding electromagnetic compatibility except as noted.

Dimensions

20 Series Models



25 Series Models



Pressure Ranges and Factory Settings

NOTES

- Values in () are mathematical conversions from psi to kPa/MPa—they do not reflect actual second scale range. U.S.A. standard scale is psi/kPa; U.K. standard scale is psi/bar—exact set-point shown. Consult factory for other scales.
- For models 20PE and 25PE; the switch trip point cannot be set at either the low or high extreme of the scale. The trip point must allow for the reset differential.
- For adjustable switch models, the trip point is adjustable **only** over the lower half of the scale.

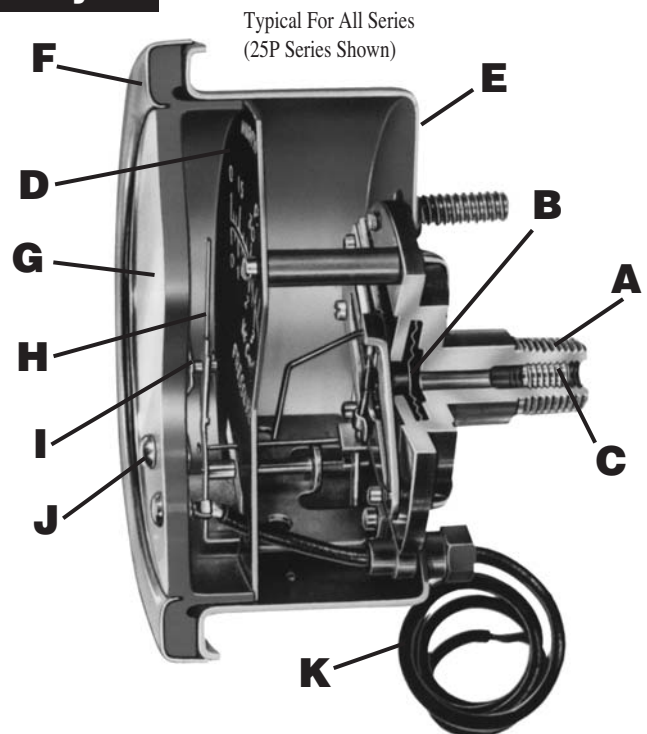
Ranges Available psi (kPa) [bar]	Maximum Pressure	Standard Settings			High Settings*			20PABS and 25PABS Settings										
		psi (kPa) [bar]	psi (kPa) [bar]	psi (kPa) [bar]	psi (kPa) [bar]	psi (kPa) [bar]	Low			Alarm†								
0-15 (103) [1.0]	2 x scale	3 (21) [0.2]	12 (83) [0.8]	3 (21) [0.2]	6 (41) [0.3]	7 (48) [0.4]	10 (69) [0.8]	15 (103) [1.0]	18 (124) [1.5]	20 (138) [1.0]	23 (159) [1.5]	30 (207) [1.5]	33 (228) [2.0]	50 (345) [3.0]	53 (365) [4.0]	75 (517) [5.0]	78 (538) [5.0]	150 (1MPa) [10]
0-30 (207) [2.0]	2 x scale	7 (48) [0.4]	24 (165) [1.6]	7 (48) [0.4]	10 (69) [0.8]	10 (69) [0.8]	13 (90) [1.0]	15 (103) [1.0]	18 (124) [1.5]	20 (138) [1.0]	23 (159) [1.5]	30 (207) [1.5]	33 (228) [2.0]	50 (345) [3.0]	53 (365) [4.0]	75 (517) [5.0]	78 (538) [5.0]	150 (1MPa) [10]
0-50 (345) [3.5]	2 x scale	10 (69) [0.8]	40 (276) [2.8]	10 (69) [0.8]	13 (90) [1.0]	10 (69) [0.8]	13 (90) [1.0]	15 (103) [1.0]	18 (124) [1.5]	20 (138) [1.0]	23 (159) [1.5]	30 (207) [1.5]	33 (228) [2.0]	50 (345) [3.0]	53 (365) [4.0]	75 (517) [5.0]	78 (538) [5.0]	150 (1MPa) [10]
0-75 (517) [5.0]	2 x scale	15 (103) [1.0]	60 (414) [4.0]	15 (103) [1.0]	18 (124) [1.5]	15 (103) [1.0]	18 (124) [1.5]	15 (103) [1.0]	18 (124) [1.5]	20 (138) [1.0]	23 (159) [1.5]	30 (207) [1.5]	33 (228) [2.0]	50 (345) [3.0]	53 (365) [4.0]	75 (517) [5.0]	78 (538) [5.0]	150 (1MPa) [10]
0-100 (690) [7.0]	2 x scale	20 (138) [1.5]	80 (552) [5.5]	20 (138) [1.5]	23 (159) [1.5]	20 (138) [1.5]	23 (159) [1.5]	20 (138) [1.5]	23 (159) [1.5]	20 (138) [1.0]	23 (159) [1.5]	30 (207) [1.5]	33 (228) [2.0]	50 (345) [3.0]	53 (365) [4.0]	75 (517) [5.0]	78 (538) [5.0]	150 (1MPa) [10]
0-150 (1.0MPa) [10]	2 x scale	30 (207) [2.0]	120 (827) [8.0]	30 (207) [2.0]	33 (228) [2.0]	30 (207) [2.0]	33 (228) [2.0]	30 (207) [2.0]	33 (228) [2.0]	30 (207) [1.5]	33 (228) [2.0]	50 (345) [3.0]	53 (365) [4.0]	75 (517) [5.0]	78 (538) [5.0]	150 (1MPa) [10]	150 (1MPa) [10]	150 (1MPa) [10]
0-200 (1.4MPa) [14]	2 x scale	50 (345) [3.0]	150 (1MPa) [10]	50 (345) [3.0]	53 (365) [4.0]	50 (345) [3.0]	53 (365) [4.0]	50 (345) [3.0]	53 (365) [4.0]	50 (345) [3.0]	53 (365) [4.0]	75 (517) [5.0]	78 (538) [5.0]	150 (1MPa) [10]	150 (1MPa) [10]	150 (1MPa) [10]	150 (1MPa) [10]	150 (1MPa) [10]
0-300 (2.1MPa) [20]	1-2/3 x scale	75 (517) [5.0]	225 (1.6MPa) [15]	75 (517) [5.0]	78 (538) [5.0]	75 (517) [5.0]	78 (538) [5.0]	75 (517) [5.0]	78 (538) [5.0]	75 (517) [5.0]	78 (538) [5.0]	150 (1MPa) [10]	150 (1MPa) [10]	150 (1MPa) [10]	150 (1MPa) [10]	150 (1MPa) [10]	150 (1MPa) [10]	150 (1MPa) [10]
0-400 (2.8MPa) [28]	1-1/4 x scale	150 (1.0MPa) [7.0]	300 (2.1MPa) [20]	150 (1.0MPa) [7.0]	150 (1MPa) [10]	150 (1.0MPa) [7.0]	150 (1MPa) [10]	150 (1.0MPa) [7.0]	150 (1MPa) [10]	150 (1.0MPa) [7.0]	150 (1MPa) [10]	150 (1MPa) [10]	150 (1MPa) [10]	150 (1MPa) [10]	150 (1MPa) [10]	150 (1MPa) [10]	150 (1MPa) [10]	150 (1MPa) [10]

*Low settings for Hi/Lo option same as standard settings. Hi/Lo option available for 20P and 25P models only.

†SPDT Snap-switch is the alarm switch.

The Inside Story

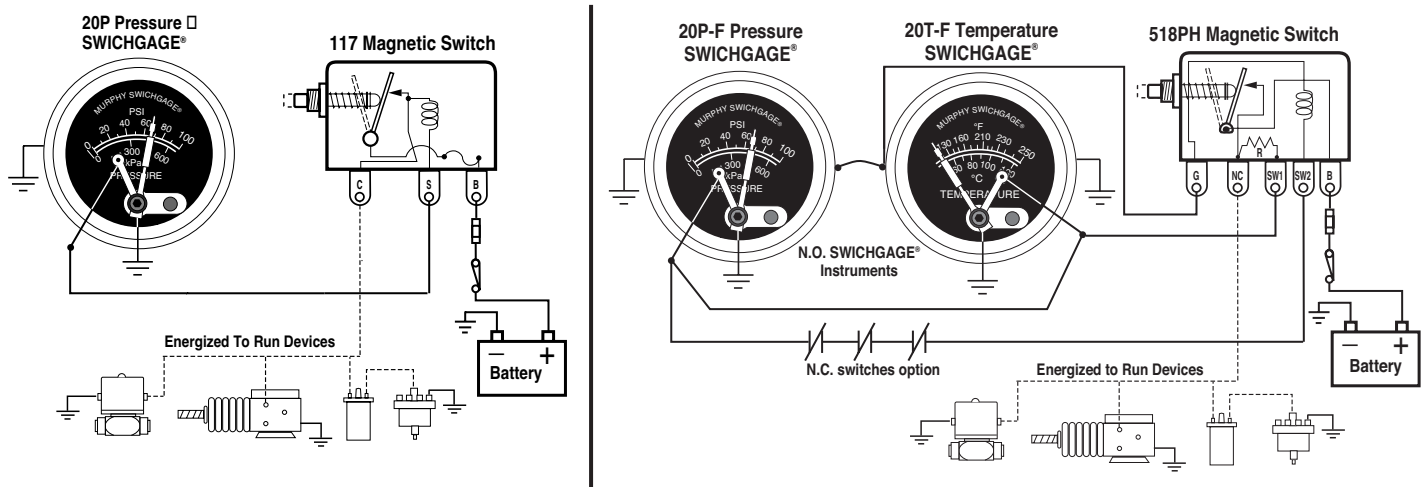
- A. Process Connection and Port:** Machined from brass bar stock. Together with the diaphragm forms the diaphragm chamber.
- B. Diaphragm:** Beryllium copper; material is die formed and heat treated to very close physical and metallurgical specifications.
- C. Pulsation Dampener:** Designed to minimize undesirable pointer chatter. It is removable for cleaning.
- D. Dial:** White letters on a black background, dual scale (psi & kPa) standard; others available on request (see How to Order on page 4).
- E. Case:** Steel with zinc and iridite; mounting clamp included (except for direct mount models).
- F. Bezel:** Polished stainless steel standard, black bezel also available.
- G. Lens:** Made of polycarbonate glass, high-impact treated.
- H. Pointer:** Tempered nickel silver for continuity and corrosion resistance. It is mounted on a machined brass post.
- I. Limit Contact:** SPST contact; N.C. when low limit is met. N.O. when pointer operates above limit.
- J. Limit Contact Adjustment:** by 1/16 in. hex type wrench thru 100% of the scale. Easy adjustment knob available.
- K. Wire Leads:** 12 in. (305 mm) long, 18 AWG (1.0 mm²) for face-adjustable contacts. 20 AWG (0.75 mm²) for Snap-switches models.



Magnetic Switch

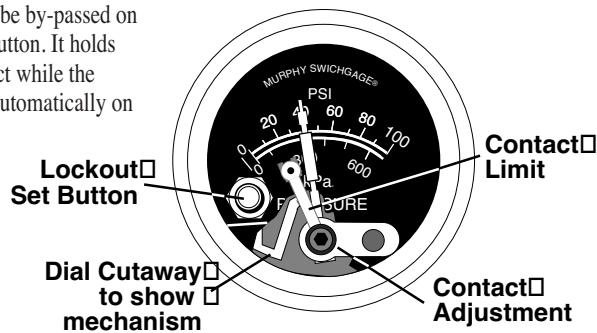
INDUCTIVE AND HIGH CURRENT LOADS REQUIRE THE USE OF A MAGNETIC SWITCH. The SWICHGAGE® contacts are for light-duty electrical switching to operate alarms or control devices. Murphy manufactures the Magnetic Switch for protection of the light-duty SWICHGAGE® limit contacts.

TATTLETALE® Magnetic Switches show the cause of shutdown for applications that include: capacitor discharge or magneto ignitions, battery systems and electric motor driven equipment. Typical wiring diagrams are shown below.



Start-Up Lockout

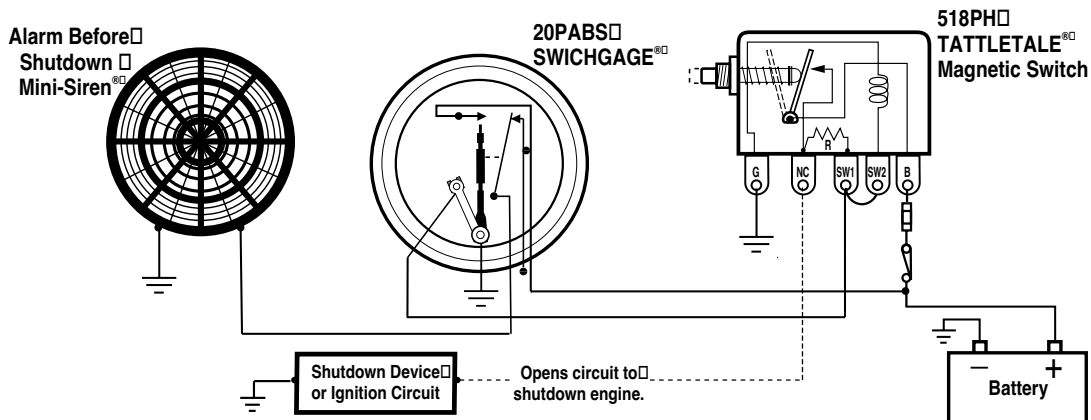
The SWICHGAGE® low limit contact can be by-passed on start-up by pushing this optional lockout button. It holds the pointer away from the shutdown contact while the engine starts. The lockout will disengage automatically on rising pressure.



Pre-Alarm Using 20/25PABS

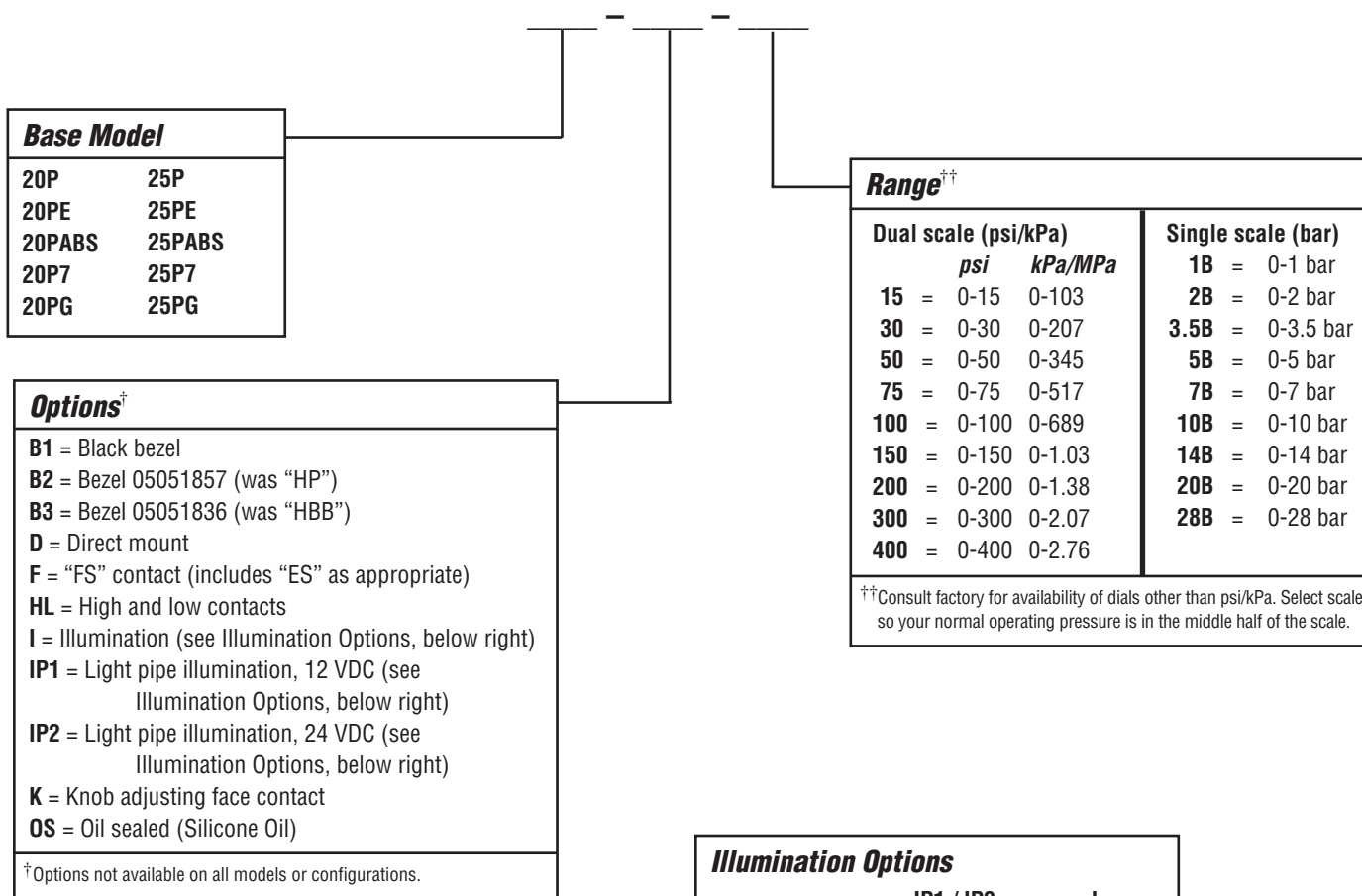
The 20PABS and 25PABS features a standard limit contact for low pressure equipment shutdown. It also has an internal SPDT snap-switch to signal an alarm before shutting down. When the low side of the snap-switch trips (preset point), on falling pressure, the switch completes a circuit to activate an alarm. If the pressure continues to fall, the face-adjustable pointer contact will make and

the shutdown circuit will be completed (see the typical diagram below for reference). The front contact shutdown limit setting (which is adjustable) and the snap-switch are preset at the factory. Refer to "Pressure Ranges and Factory Settings" table on opposite page for settings. For alternative alarm before shutdown, see Magnetic Switch model 760A or 761APH.



How to Order

To order, use the diagram below. List options in ascending alphabetical order (A-Z). Example: **20P-IP1-100**.



Illumination Options		
	IP1 / IP2	I
20 Series	x	x¹
25 Series	N/A	N/A

¹Can be used with standard Clamp Lite Assembly (12 V= 05702176; 24 V= 05702177).



Manometri SWICHGAGE® serie A20 e A25



2 and 2-1/2 in. (51 and 64 mm) Dial

- Corrosion Resistant Polycarbonate Case
- Indicating Gage and Limit Switch
- Switch Can Activate Alarms and/or Shut Down Equipment
- Critical Pressure Limit Switch Is Visible and Adjustable (Most Models)
- Contact(s) Isolated From Ground

Description

The A20 Series (2 inch/51 mm dial) and the A25 Series (2-1/2 inch/64 mm dial) SWICHGAGE® models are diaphragm-actuated, pressure-indicating gages, with built-in electrical switches for tripping alarms and/or shutdown devices.

Ranges are available from 0-15 psi (103 kPa) [1.0 bar] thru 0-400 psi (2.8 MPa) [28 bar].

All models of these rugged, built-to-last instruments are face sealed from the environment by the unique combination of a polycarbonate case and lens, a polished stainless steel bezel and O-ring seals. Ranges above 30 psi (207 kPa) [2 bar] are totally sealed from the external environment (except PE Series).

Accuracy and protection from moderate overpressure is assured by a unique, unitized diaphragm chamber. A built-in pulsation dampener helps eliminate pointer flutter and is removable for cleaning.

For series A20P and A25P, the gage pointer acts as a pressure indicator and as one switch pole which completes a circuit when it touches the adjustable limit contact. Contacts have self-cleaning motion to ensure electrical continuity.

Models A20PE and A25PE have internal snap-acting SPDT switches for three wire control; can be wired to make or to break a circuit.

Gage-only models, without switches (MURPHY-GAGE®) are also available.

Applications

A20/A25 Series applications include: engines/equipment in Oil Field, Marine, Irrigation, Construction and Trucking Engines for Lube Oil Pressure, Water Pump Pressure, Hydraulic Pressure, Air Pressure, etc.

Specifications

Dial: White on black, dual scale; U.S.A. standard scale is psi/kPa; U.K. standard scale is psi/bar (see How to Order).

Case: Polycarbonate/glass filled, corrosion-resistant; steel mounting clamp included.

Bezel: Polished stainless steel, standard; others are available (see How to Order).

Pointer: Tempered nickel silver; Red tip.

Lens: Polycarbonate, high-impact.

Oil: Silicon Oil.

Temperature Range:

Ambient: -40°F (-40°C) thru 150°F (66°C).

Process: -40°F (-40°C) thru 250°F (121°C).

Process Connection: 1/8-27 NPTM brass.

Sensing Element: Beryllium copper diaphragm.

Gage Accuracy (% of Full Scale):

RANGE	LOWER 1/4	MIDDLE 1/2	UPPER 1/4
≤300 psi (20 Bar)	±3%	±2%	±3%
400 psi (28 Bar)	±3%	±3%	±5%

Maximum Pressure: See Pressure Ranges and Factory Settings table on page 2.

Adjustable Limit Contact (A20P and A25P):

SPST contact; pilot-duty only, 2 A @ 30 VAC/DC;

Closed when the low limit is met. Open when pointer is in normal operating range.

Contacts are gold flashed silver.

Limit Contact Adjustment: *by a 1/16 in. hex wrench thru 100% of the scale.*

Wiring: A20P: Number 4 screw terminals;

A25P: Number 6 screw terminals.

Snap-Switch Rating (A20PE and A25PE):

SPDT, 3 A @ 30 VDC inductive; 4 A @ 125 VAC inductive.

Wiring: A20PE: Number 4 screw terminals;

A25PE: Number 6 screw terminals.

Unit Weight: A20 Series: 8 oz. (0.23 kg).

A25 Series Models: 11 oz. (0.31 kg).

Unit Dimensions: A20 Series: 3 x 3 x 3 in. (76 x 76 x 76 mm). A25 Series Models: 4-3/4 x 4-3/4 x 2-3/4 in. (121 x 121 x 70 mm).

Base Models

A20P and A25P Series SWICHGAGE®

The gage pointer makes with an adjustable contact to complete a pilot-duty circuit.

A20PE and A25PE SWICHGAGE®

A20PE (was A20EO) and A25PE (was A25PEO).

Features internal snap-acting SPDT switches, instead of the single pole/pointer contacts. When the switch closes on falling pressure, it becomes Set, as pressure rises the switch Resets (refer to wiring diagram on page 3).

Model A25PE is CSA listed for non-hazardous areas.

Model A25PE-EX is CSA listed for Class I, Division 1, Groups C and D hazardous areas.

A20PABS and A25PABS SWICHGAGE®

Sames as A20P and A25P with internal SPDT snap-switch for pre-alarm.

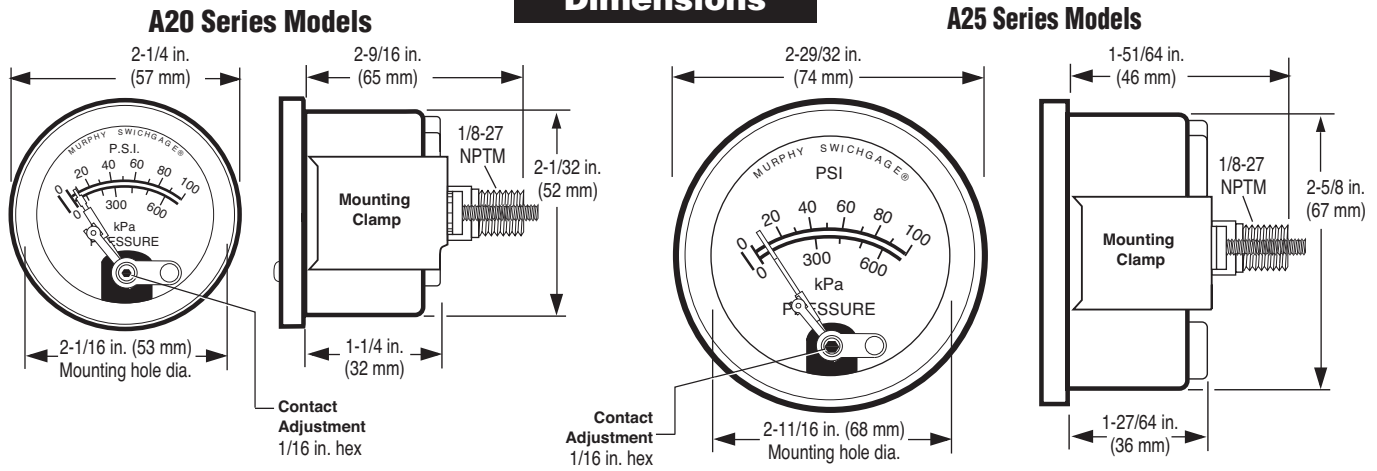
A20PG and A25PG MURPHYGAGE®

Gage without contact(s).



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

Dimensions



Pressure Ranges and Factory Settings

NOTES

- Values in () are mathematical conversions from psi to kPa/MPa—they do not reflect actual second scale range. U.S.A. standard scale is psi/kPa; U.K. standard scale is psi/bar-exact set-point shown. Consult factory for other scales.
- For models A20PE and A25PE; the switch trip point cannot be set at either the low or high extreme of the scale. The trip point must allow for the reset differential.
- For adjustable switch models, the trip point is adjustable **only** over the lower half of the scale.

Ranges Available			Maximum Pressure	Standard Settings			High Settings*			A20PABS and A25PABS Settings					
psi	(kPa)	[bar]		psi	(kPa)	[bar]	psi	(kPa)	[bar]	Low			Alarm†		
0-15	(103)	[1.0]	30 psi (207)	3	(21)	[0.2]	12	(83)	[0.8]	3	(21)	[0.2]	6	(41)	[0.3]
0-30	(207)	[2.0]	60 psi (413)	7	(48)	[0.4]	24	(165)	[1.6]	7	(48)	[0.4]	10	(69)	[0.6]
0-50	(345)	[3.5]	100 psi (690)	10	(69)	[0.8]	40	(276)	[2.8]	10	(69)	[0.8]	13	(90)	[1.0]
0-75	(517)	[5.0]	150 psi (1.0MPa)	15	(103)	[1.0]	60	(414)	[4.0]	15	(103)	[1.0]	18	(124)	[1.5]
0-100	(690)	[7.0]	200 psi (1.4MPa)	20	(138)	[1.5]	80	(552)	[5.5]	20	(138)	[1.0]	23	(159)	[1.5]
0-150	(1.0MPa)	[10]	300 psi (2.1 MPa)	30	(207)	[2.0]	120	(827)	[8.0]	30	(207)	[1.5]	33	(228)	[2.0]
0-200	(1.4 MPa)	[14]	400 psi (2.8 MPa)	50	(345)	[3.0]	150	(1 MPa)	[10]	50	(345)	[3.0]	53	(365)	[4.0]
0-300	(2.1 MPa)	[20]	500 psi (3.4 MPa)	75	(517)	[5.0]	225	(1.6MPa)	[15]	75	(517)	[5.0]	78	(538)	[5.0]
0-400	(2.8 MPa)	[28]	500 psi (3.4 MPa)	150	(1.0 MPa)	[7.0]	300	(2.1MPa)	[20]	75	(517)	[5.0]	150	(1MPa)	[10]

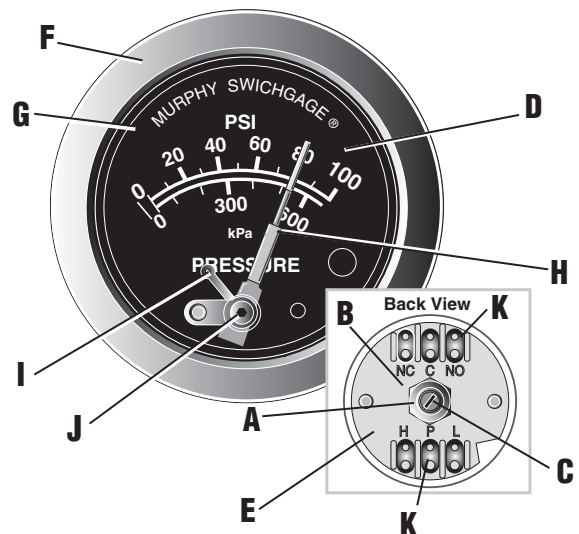
**Low settings for Hi/Lo option same as standard settings. Hi/Lo option available for A20P and A25P models only.

†SPDT Snap-switch is the alarm switch.

Features

- Process Connection and Port:** Machined from brass bar stock. Together with the diaphragm forms the diaphragm chamber.
- Diaphragm (not shown):** Beryllium copper die formed and heat treated to very close physical and metallurgical specifications.
- Pulsation Dampener:** Designed to minimize undesirable pointer chatter. It is removable for cleaning.
- Dial:** White letters on a black background, dual scale; others available on request—see How to Order.
- Case:** Polycarbonate/glass filled, corrosion resistant; mounting clamp included.
- Bezel:** Polished stainless steel standard, black bezel also available.
- Lens:** Made of high-impact resistant treated polycarbonate.
- Pointer:** Tempered nickel silver for continuity and corrosion resistance—mounted on a machined brass post. Red tip.
- Limit Contact:** SPST contact; N.C. when low limit is met. N.O. when pointer operates above limit.
- Limit Contact Adjustment:** by 1/16 in. hex type wrench thru 100% of the scale. Easy adjustment knob available.
- Electrical Connections:** Number 4 screw terminals for A20 Series; and number 6 screw terminals for A25 Series models.

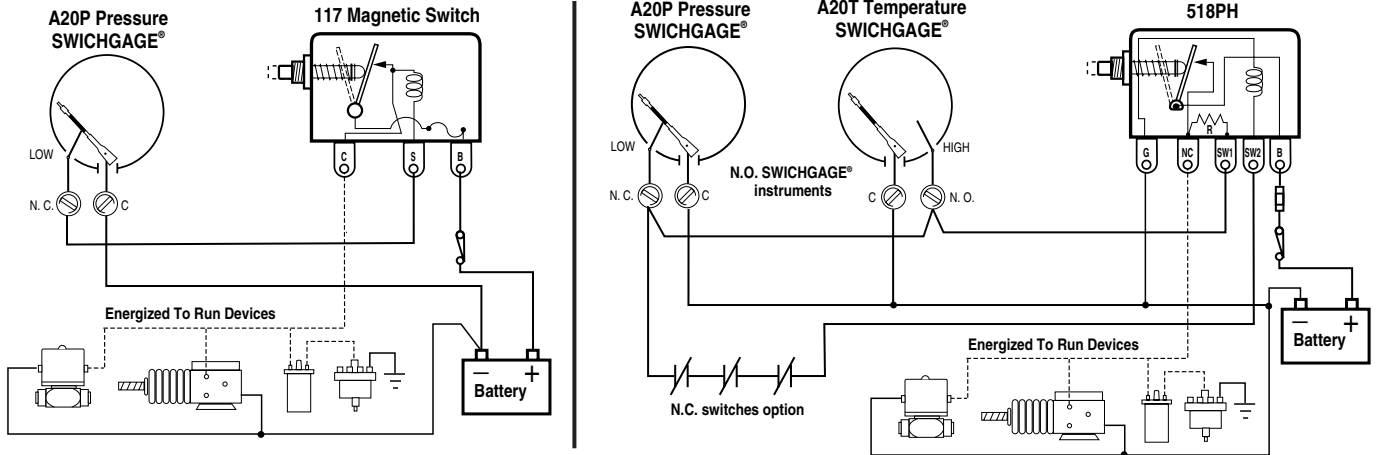
Typical For All Series (A25P Series Shown)



Magnetic Switch

INDUCTIVE AND HIGH CURRENT LOADS REQUIRE THE USE OF A MAGNETIC SWITCH. The SWICHGAGE® contacts are for light-duty electrical switching to operate alarms or control devices. Murphy manufactures the Magnetic Switch for protection of the pilot-duty SWICHGAGE® limit contacts.

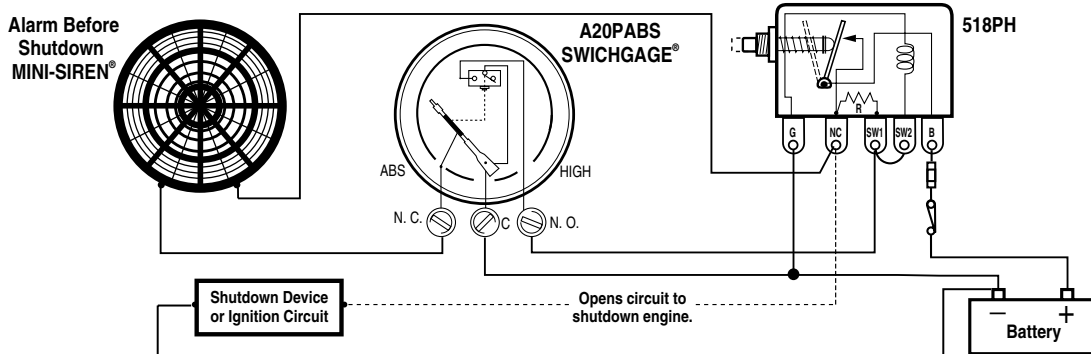
TATTLETALE® Magnetic Switches show the cause of shutdown for applications that include: capacitor discharge or magneto ignitions, battery systems and electric motor driven equipment. Typical wiring diagrams are shown below.



Pre-Alarm Using A20/A25PABS

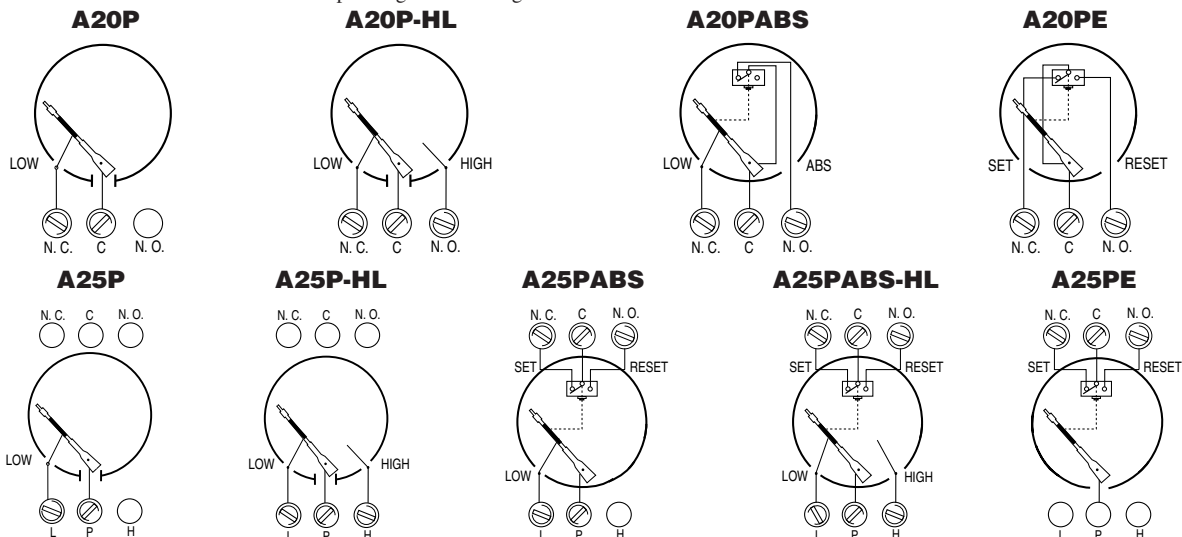
The A20PABS and A25PABS features a standard limit contact for equipment shutdown on low pressure. It also has an internal SPDT snap-switch to signal an alarm before shutting down. When the snap-switch trips (preset point), on falling pressure, the switch completes a circuit to activate an alarm. If the pressure continues to fall, the face-adjustable pointer contact will make and the shutdown circuit will be completed (see the typical diagram below for reference). The front contact shutdown limit setting (which is adjustable) and the snap-switch are pre-set at the factory. Refer to "Pressure Ranges and Factory Settings" table on opposite page for settings. For alternative alarm before shutdown, see Magnetic Switch model 760A or 761APH.

The front contact shutdown limit setting (which is adjustable) and the snap-switch are pre-set at the factory. Refer to "Pressure Ranges and Factory Settings" table on opposite page for settings. For alternative alarm before shutdown, see Magnetic Switch model 760A or 761APH.



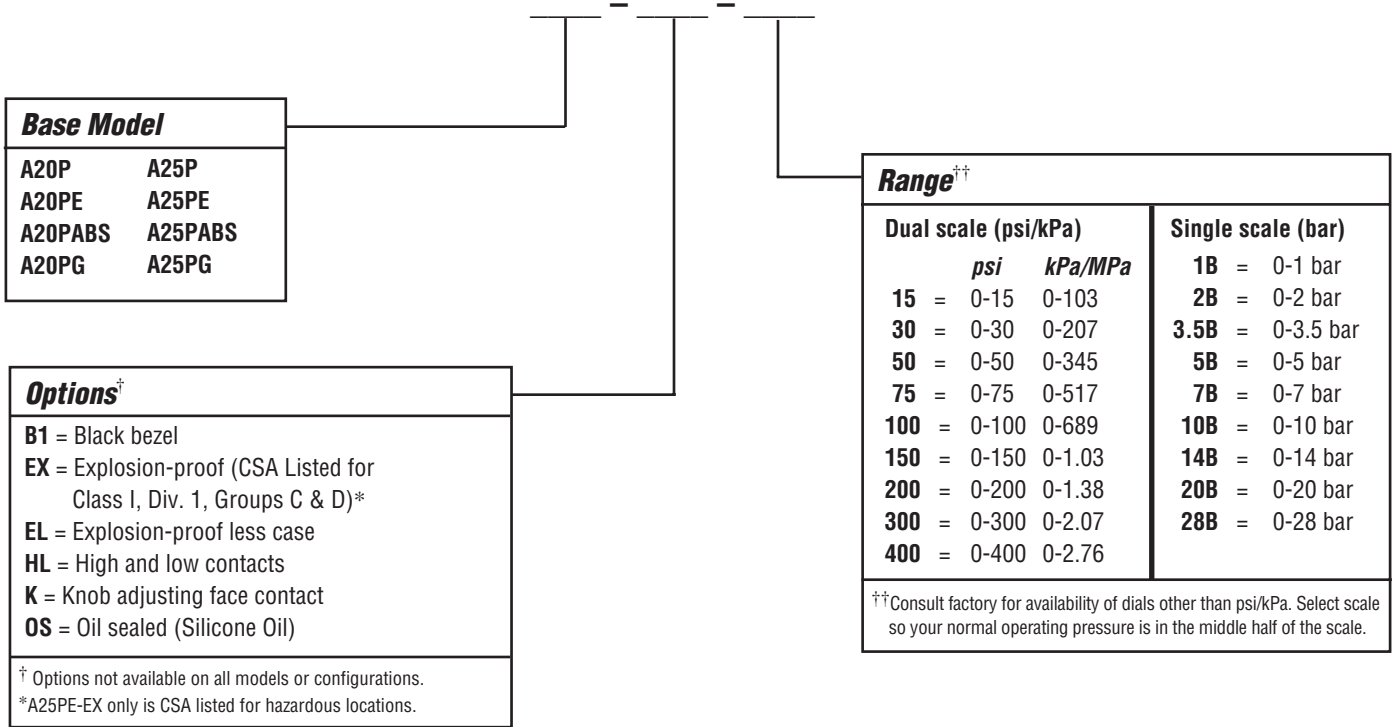
Typical Internal Wiring Diagrams

Pointer shown in the shelf position. Pointer type contact rating: pilot-duty 2 A @ 30 VAC/VDC resistive. Snap-acting switch rating: 3 A @ 30 VDC inductive, 4 A @ 125 VAC inductive.



How to Order

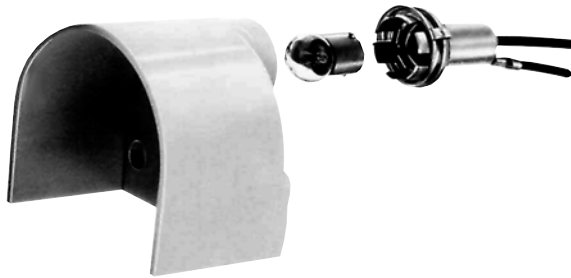
To order, use the diagram below. List options in ascending alphabetical order (A-Z). Example: **A20P-K-100**.



Illumination – Order Separately

A20 Series: Clamp Lite Assembly; 12 V= 05702176; 24 V= 05702177

A25 Series: N/A.



Vuotometri SWICHGAGE® Serie 20, 25, A20 e A25



2 and 2-1/2 in. (51 and 64 mm) Dial

- Combination Indicating Gage and Limit Switch
- Critical Vacuum Limit Switches Are Visible and Adjustable (Most Models)
- Switch Can Activate Alarms and/or Shutdown Equipment
- Monitor Engine Load

Description

The 20 Series (2 inch/51 mm dial) and the 25 Series (2-1/2 inch/64 mm dial) SWICHGAGE® models are diaphragm-actuated, vacuum-indicating gages, with built-in electrical switches. These switches are used for tripping alarms and/or shutdown devices.

The 20 and 25 series gage mechanism is enclosed in a steel case coated to resist corrosion. The A20 and A25 series gage has a polycarbonate case and is sealed from the environment. All gages feature a polycarbonate, break-resistant lens and a polished, stainless steel bezel to help protect these rugged, built-to-last instruments. The gage pointer acts as a pressure indicator and as one switch pole which completes a circuit when it touches the adjustable limit contact. Contacts have a self-cleaning motion to ensure electrical continuity.

Gage-only models, without contacts (MURPHYGAGE®), are also available.

A pulsation dampener (PD2160) is included with each SWICHGAGE® to help eliminate pointer flutter. When monitoring intake manifold vacuum, the PD2160 is mounted in the manifold. The PD2160 has a 1/8-27 NPT connection.

A vacuum tubing kit (V5179) is available for all models to help reduce pulsations. The kit includes 48 inches (1.2 m) of copper tubing and two compression fittings. Specify tubing kit V5179.

Applications

Commonly used to measure loading of spark ignition engines through intake manifold vacuum. Also can serve as overspeed protection from sudden loss of load on these engines. Use anywhere the vacuum source is compatible with port materials.

Specifications

Dial: White on black, dual scale; U.S.A. standard scale is Inches of Hg/kPa.

Case (mounting clamp included):

20 and 25 Series: *Plated steel.*

A20 and A25 Series: *Polycarbonate/glass filled.*

Bezel: Polished stainless steel, standard; others are available (see How to Order).

Lens: Polycarbonate, high-impact.

Process Connection: 1/8-27 NPTM brass.

Sensing Element: Beryllium copper diaphragm.

Gage Accuracy: $\pm 2\%$ of scale in operating range (mid 1/3 of scale).

Adjustable Limit Contacts:

2-SPST contacts; pilot-duty only, 2 A @ 30 VAC/DC. Contacts are gold flashed silver. Limit Contact Adjustment: *by a 1/16 in. hex wrench.*

Limit Contact Wire Leads (20 and 25 Series):

18 AWG (1.0 mm²) x 12 in. (305 mm).

Limit Contact Terminals: *A20 Series number 4 screw terminals; A25 Series number 6 screw terminals.*

Unit Weight

20 Series: *8 oz. (0.23 kg).*

25 Series: *11 oz. (0.31 kg).*

A20 Series: *6 oz. (0.17 kg).*

A25 Series: *10 oz. (0.28 kg).*

Unit Dimensions

20 and A20 Series: *3 x 3 x 3 in. (76 x 76 x 76 mm).*

25 and A25 Series: *4-3/4 x 4-3/4 x 2-3/4 in. (121 x 121 x 70 mm).*

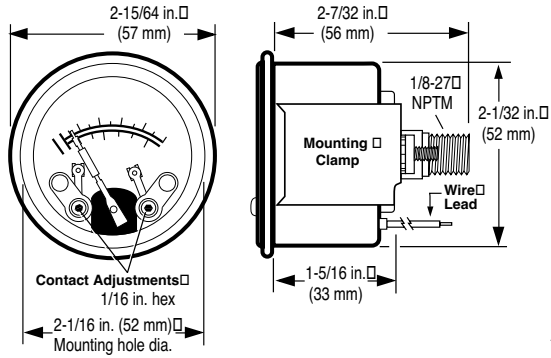
Warranty

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

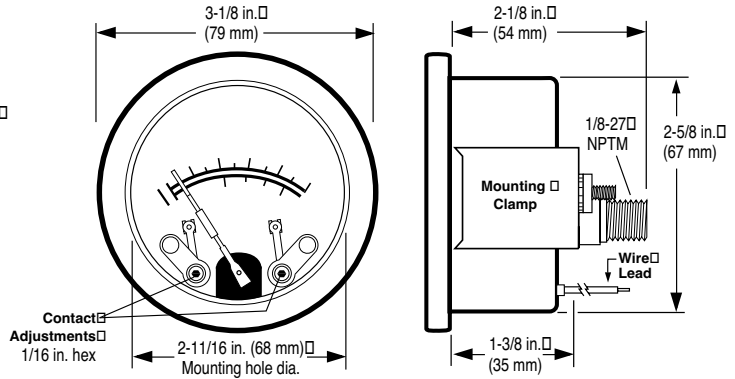
**Products covered by this bulletin comply with EMC Council directive 89/336/EEC regarding electromagnetic compatibility except as noted.

Dimensions

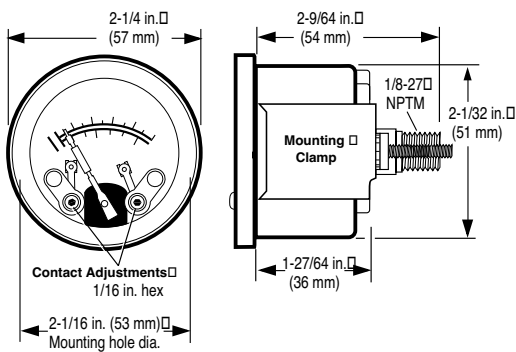
20 Series Models



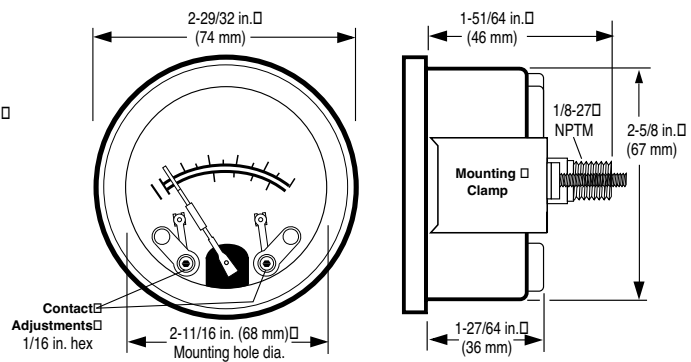
25 Series Models



A20 Series Models

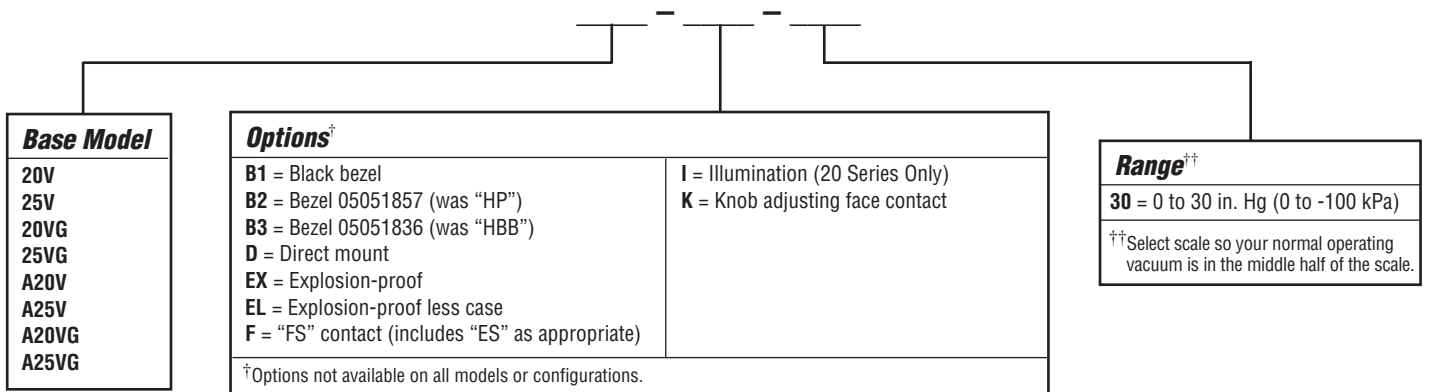


A25 Series Models



How to Order

To order, use the diagram below. List options in ascending alphabetical order (A-Z). Example: **20V-I-30**.
Order the vacuum tubing kit as a separate item (specify **V5179**).



Manometro differenziale per intasamento filtri

20DP, 25DP, A20DP and A25DP Series

2 and 2-1/2 in. (51 and 64 mm) Dial



20DP-50



- Monitors Engine Oil and Fuel Filters
- Actuates Alarm or Shutdown System When Filter Becomes Clogged
- Combination Indicating Gage and Limit Switch
- Actuates Filter Backwash
- Signals Coolant Loss or Aeration On Engine Water Pump

Description

The 20DP and A20DP Series (2 inch/51 mm dial) and the 25DP and A25DP Series (2-1/2 inch/64 mm dial) SWICHGAGE® models are diaphragm-actuated, differential pressure-indicating gages, with a built-in electrical switch. This switch is used for tripping alarms and/or shutting down equipment. These gages are intended to monitor and indicate oil, fuel or water filter restriction and can reduce the risk of dangerously high pressure which may rupture the filter, resulting in contaminants entering the system.

The 20DP and 25DP series mechanism is enclosed in a steel case coated to resist corrosion. The A20DP and A25DP series have a polycarbonate case and are sealed from the environment. All feature a polycarbonate, break-resistant lens and a polished, stainless steel bezel to help protect these rugged, built-to-last instruments.

The gage pointer acts as a pressure indicator and as one switch pole which completes a circuit when it touches the adjustable limit contact. Contacts have self-cleaning motion to ensure electrical continuity.

Features

- **CONSTANT VISUAL INDICATION** of the condition of your filter is shown on the dial.
- **TWO INSTRUMENTS IN ONE** – an accurate indicating gage and adjustable p.s.i.d. limit switch. Reduces inventory and installation time.
- **ADJUSTABLE CONTACT** lets you set the monitoring range of the gage. The contact is tamperproof and can be set only with a 1/16 Allen-head wrench.
- **DURABILITY** – All gages are made of durable materials allowing them to withstand rugged applications.

- **EARLY FILTER CHANGES** cost you money and increase the risk of contaminants entering the system. A Murphy filter restriction SWICHGAGE® will let you know when to change the filter and maintain peak efficiency.

Specifications

Dial: White on black, dual scale; U.S.A. standard scale is psi/kPa. Other scales available—inquire.

Case: 20DP and 25DP Series: *plated steel.*

A20DP and A25DP Series: *polycarbonate.*

Bezel: Polished stainless steel, standard; others are available (see How to Order).

Lens: Polycarbonate, high-impact.

Temperature Range:

Ambient: -40°F (-40°C) thru 150°F (66°C).

Process: -40°F (-40°C) thru 250°F (121°C).

Process Connection: 1/8-27 NPTM brass.

Sensing Element: Beryllium copper diaphragm.

Gage Accuracy: ±3% maximum across scale.

Adjustable Limit Contact: SPST contact; pilot-duty only, 2 A @ 30 VAC/DC; closed when the low limit is met, open when pointer is in normal operating range. Contacts are gold flashed silver.

Limit Contact Adjustment: *by 1/16 in. hex wrench thru 100% of scale.*

Limit Contact Wire Leads (20DP and 25DP Series): *18 AWG (1.0 mm²) x 12 in. (305 mm).*

Limit Contact Terminals: *A20DP Series number #4 screw terminals. A25DP Series number 6 terminals.*

Snap-Switch Rating (“DPE” models):

SPDT, 3 A @ 30 VDC inductive; 4 A @ 125 VAC inductive.

Unit Weight:

20DP and A20DP Series: *9 oz. (0.25 kg);*

25DP and A25DP Series: *11 oz. (0.29 kg).*

Unit Dimensions:

20DP and A20DP Series: *3 x 2-3/4 x 2-3/4 in. (76 x 70 x 70 mm).*

25DP and A25DP Series: *4-3/4 x 4-3/4 x 2-3/4 in. (121 x 121 x 70 mm).*

Base Models

20DP, 25DP, A20DP and A25DP SWICHGAGE®

The gage pointer makes with an adjustable contact to complete a pilot-duty circuit.

20DPE, 25DPE, A20DPE and A25DPE SWICHGAGE®

20DPE (was 20DPEO), 25DPE (was 25DPEO), A20DPE (was A20DPEO) and A25DPE (was A25DPEO).

Features an internal snap-acting SPDT switch, instead of the single pole/pointer contacts. When the switch closes on rising pressure, it becomes Set, as pressure falls the switch Resets.

20DPG, 25DPG, A20DPG and A25DPG MURPHYGAGE®

Gage without contact(s).

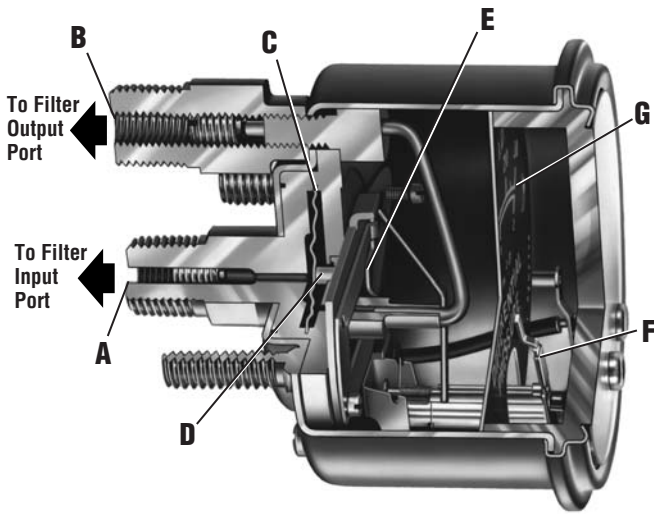
Warranty

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

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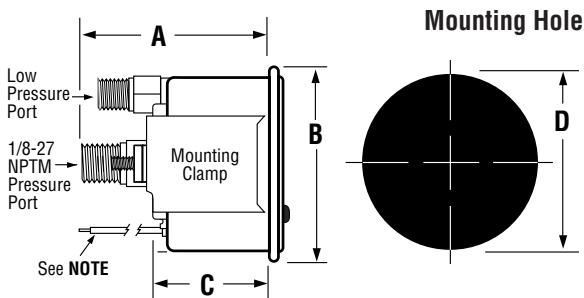


Operating Characteristics



Port **A** connects to the input side of the filter. Pressure pushes diaphragm **C** forward thus pushing the button **D** which turns the crank arm **E** which in turn moves pointer **F** to register the amount of pressure on dial **G**. Port **B** connects to the outlet side of the filter. Pressure is exerted through tube **H** and pushes on the diaphragm thus applying pressure on both sides of the diaphragm. The pointer displays pressure in the amount that the input pressure is greater than the outlet pressure. As the filter is restricted by contaminants and the pressure difference reaches the critical point, the pointer touches the pre-set limit contact and shuts down the system or activates a visual or audible signal to alert the operator.

Dimensions



	20DP Series	A20DP Series	25DP Series	A25DP Series
A	2-7/32 (56)	2-9/64 (54)	2-1/8 (54)	1-51/64 (46)
B	2-15/64 (57)	2-1/4 (57)	3-1/8 (79)	2-29/32 (74)
C	1-5/16 (33)	1-27/64 (36)	1-3/8 (35)	1-27/64 (36)
D	2-1/16 (53)	2-1/16 (53)	2-11/16 (68)	2-11/16 (68)

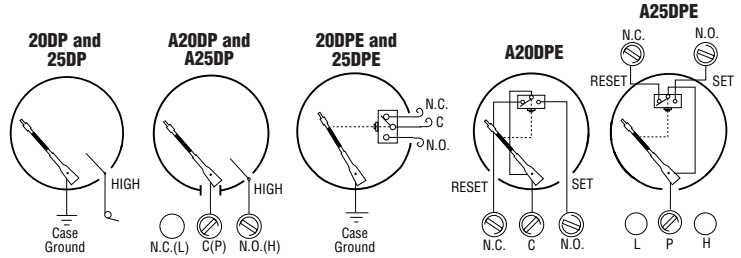
NOTE: 20 and 25 Series have 18 AWG (1.0 mm²) wire. A20 Series has #4 screw terminals and A25 Series has #6 terminals. Dimensions are in inches and (millimeters).

Ranges and Factory Settings

Ranges* Available	Max. Static Pressure	Max. Differential Pressure	Contact Setting
0-15 (0-103) [0-1.0]	200 (1.4) [14]	30 (207) [2.0]	10 (69) [0.8]
0-30 (0-207) [0-2.0]	300 (2.1) [20]	60 (414) [4.0]	20 (138) [1.0]
0-50 (0-345) [0-3.5]	300 (2.1) [20]	100 (690) [7.0]	30 (207) [2.0]
0-75 (0-517) [0-5.0]	300 (2.1) [20]	150 (1.0) [10]	50 (345) [3.5]
0-100 (0-690) [0-7.0]	300 (2.1) [20]	200 (1.4) [14]	60 (414) [4.0]

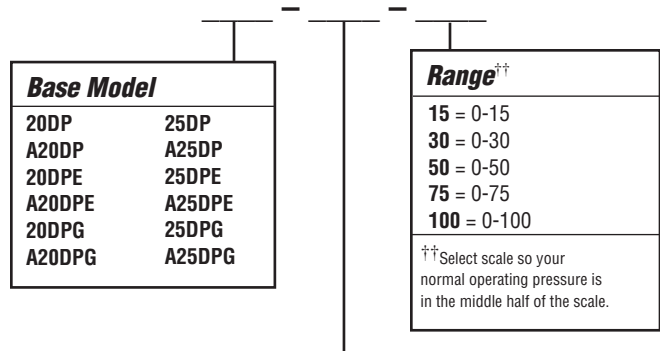
*Values are shown in psi, (kPa/MPa) and [bar]. Values in kPa/MPa and bar are mathematical conversions from psi—they do not reflect actual second scale range.

Internal Wiring



How to Order

To order, use the diagram below. List options in ascending alphabetical order (A-Z). Example: **20DP-F-30**.



Options[†]

A = Argon filled case (not available for A25DP, 25DPE, 20DPE Series)
B1 = Black bezel
B2 = Bezel 05051857 (was "HP")
B3 = Bezel 05051836 (was "HBB")
EX = Explosion-proof
EL = Explosion-proof less case

F = "FS" contact (includes "ES" as appropriate)
K = Knob adjusting face contact

[†]Options not available on all models or configurations.

