

Temperature Swichgauge® A20 and A25 Series

The A20 Series (2 inch/51 mm dial) and the A25 Series (2-1/2 inch/64 mm dial) Swichgauge 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) through 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 a 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 for A20 and A25 Series temperature Swichgauge instruments include: engines and equipment in the oil field, marine, irrigation, construction and trucking industries, monitoring engine coolant temperature, crankcase oil, transmission oil.

Base Model

Coolant or Oil Temperature

A20T and A25T Series Swichgauge: For these models the gage pointer makes with an adjustable contact to complete a pilot-duty circuit.

A20TL and A25TL Swichgauge: For use on Ford Worldwide engines. Supplied with special sensing bulb.

A20TE and A25TE Swichgauge: 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 Swichgauge: Same as A20 and A25T with internal SPDT snap-switch for pre-alarm.



Cylinder Head Temperature

A20TH and A25TH Swichgauge: A20TH (was A20TL8133) and A25TH (was A25TL8133). For use on air-cooled engines.

Gage-Only Models

A20TG and A25TG MurphyGage: Gage without contact(s).



A20T Series

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

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). * Stainless steel armor optional

Sensing Bulb: Copper*

Gage Accuracy: See accuracy chart

Maximum Temperature:

See Temperature Ranges and Factory Settings table

Maximum Ambient Temperature:

-40°F (-40°C) through 150°F (66°C)

Adjustable Limit Contact (A20T and A25T): SPST contact; pilot-duty only, 2 A @ 30 VAC/VDC; isolated from case ground
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 through 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

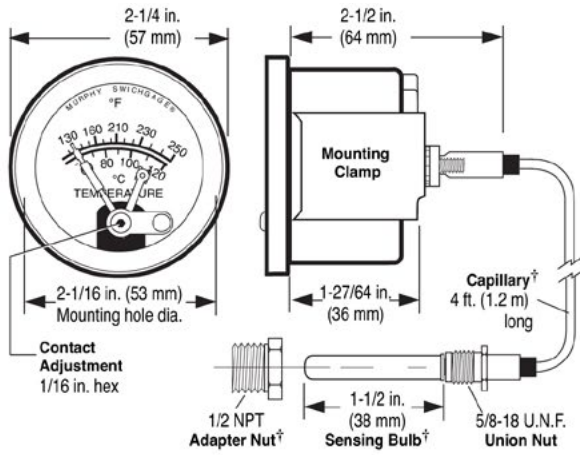
Unit Weight: A20 Series: 11.9 oz. (0.370 kg); A25 Series Models: 13.3 oz. (0.413 kg)

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)

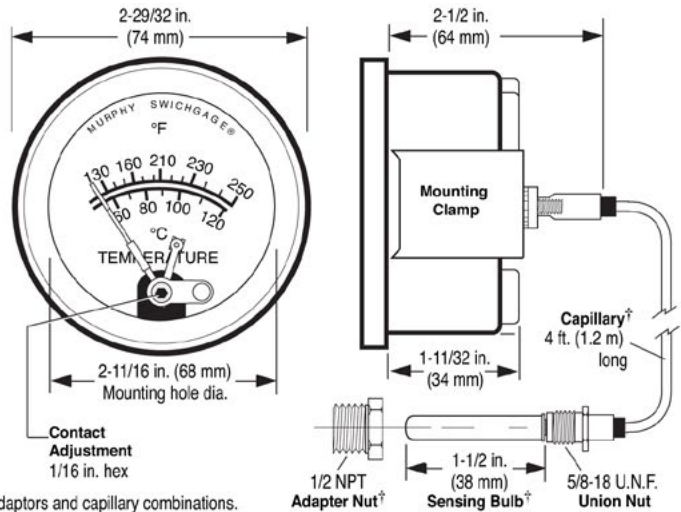
*For optional capillary lengths, engine adapters, sensing bulbs and range combinations, see Murphy bulletin 8428.

Dimensions

A20 Series Models (typical)



A25 Series Models (typical)



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

Temperature Ranges and Factory Settings

NOTES

1. 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.
2. 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. Only certain models are adjustable.
3. 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 °F (°C)	Single Scale °C only		°F (°C)	°F (°C)	°C only	Low	High	Alarm†		Shutdown	
		°F (°C)	°F (°C)	°C only	°F (°C)	°F (°C)	°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	
130-220 (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 (173)	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 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° - 120°F (0° - 49°C)	±12°F (±6°C)	±5°F (±2.4°C)	±6°F (±3°C)
32° - 160°F (0° - 71°C)	±20°F (±10°C)	±8°F (±4.4°C)	±7°F (±4°C)
130° - 220°F (54° - 104°C)	±6°F (±3°C)	±3°F (±1.6°C)	±4°F (±2°C)
130° - 250°F (54° - 121°C)	±9°F (±5°C)	±5°F (±2.4°C)	±4°F (±2°C)
140° - 300°F (60° - 149°C)	±10°F (±5.2°C)	±6°F (±3°C)	±5°F (±2.4°C)
160° - 320°F (71° - 160°C)	±10°F (±5.2°C)	±5°F (±2.4°C)	±5°F (±2.4°C)
180° - 350°F (82° - 177°C)	±12°F (±6°C)	±5°F (±2.4°C)	±5°F (±2.4°C)
300° - 440°F (149° - 227°C)	±9°F (±5°C)	±5°F (±2.4°C)	±4°F (±2°C)

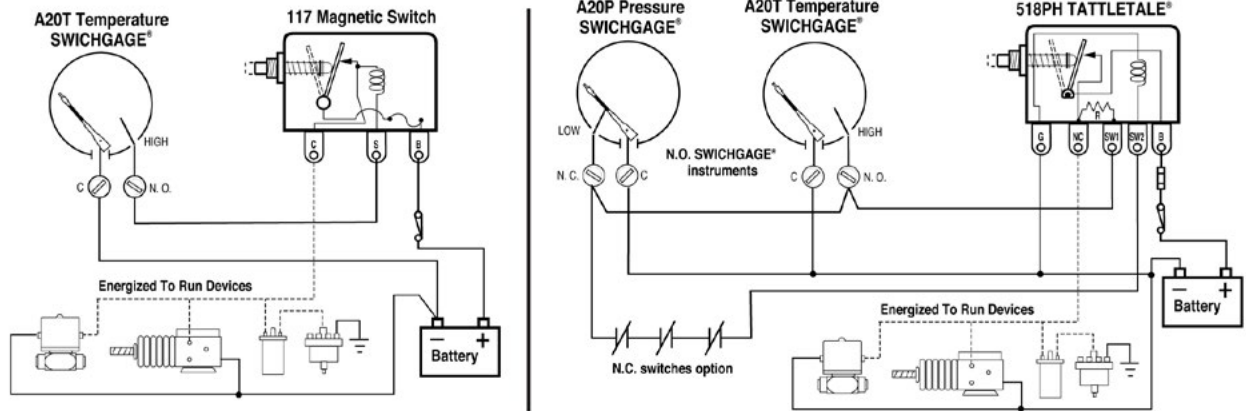
Warranty — A limited warranty on materials and workmanship is given with this Murphy product.

A copy of the warranty may be viewed or printed by going to www.fwmurphy.com/support/warranty.htm

Magnetic Switch

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

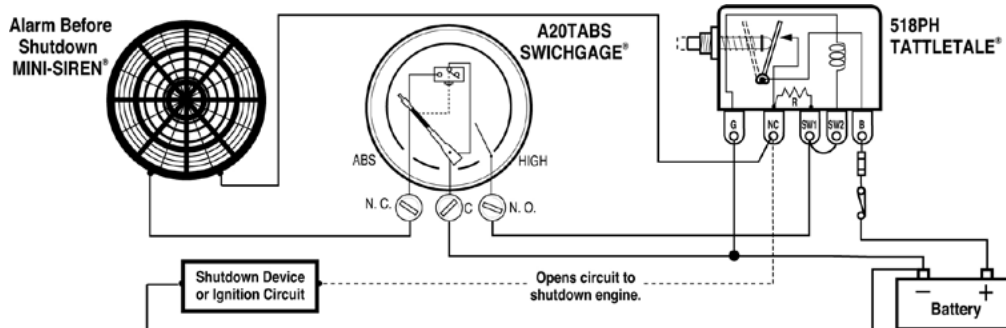
Tattletale® Magnetic Switches show the cause of shutdown for applications that include: capacitor discharge or magneto ignitions, battery systems and electric motor driven equipment. Typical wiring diagrams are shown.



Pre-Alarm using A20/A25TABS

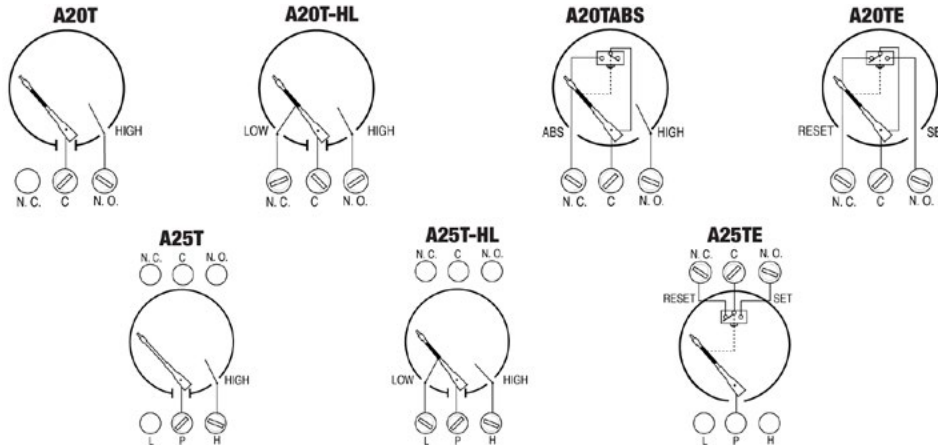
The A20TABS and A25TABS feature a standard limit contact for equipment shutdown on high temperature and an internal SPDT snap-switch to signal an alarm before shutting down. When the snap-switch trips (preset point) on rising temperature, the switch completes a circuit to activate an alarm.

If the temperature continues to increase, the face-adjustable pointer contact will make and the shutdown circuit will be completed (see the typical diagram). 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 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

Options listed below. All configurations may not be available. Call your sales representative or Enovation Controls for more information.


Base Model	
A20T	A20TG
A20TE	A25T
A20TABS	A25TE
	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.

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)	Single scale (°C)																																					
<table border="0"> <tr> <td></td> <td>°F</td> <td>°C</td> </tr> <tr> <td>120</td> <td>= 32-120</td> <td>0-49</td> </tr> <tr> <td>160</td> <td>= 32-160</td> <td>0-71</td> </tr> <tr> <td>220</td> <td>= 130-220</td> <td>54-104</td> </tr> <tr> <td>250</td> <td>= 130-250</td> <td>60-121</td> </tr> <tr> <td>300</td> <td>= 140-300</td> <td>60-149</td> </tr> <tr> <td>320</td> <td>= 160-320</td> <td>71-160</td> </tr> <tr> <td>350</td> <td>= 180-350</td> <td>82-177</td> </tr> <tr> <td>440</td> <td>= 300-440</td> <td>149-227</td> </tr> </table>		°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	<table border="0"> <tr> <td>70C</td> <td>= 0-70°C</td> </tr> <tr> <td>100C</td> <td>= 45-100°C</td> </tr> <tr> <td>120C</td> <td>= 50-120°C</td> </tr> <tr> <td>140C</td> <td>= 60-140°C</td> </tr> <tr> <td>160C</td> <td>= 70-160°C</td> </tr> </table>	70C	= 0-70°C	100C	= 45-100°C	120C	= 50-120°C	140C	= 60-140°C	160C	= 70-160°C
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^{††} 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.																																						

Part Number	Model and Description	Notes
05702176	A20 Series Clamp Lite Assembly; 12V	
05702177	A20 Series Clamp Lite Assembly; 24V	
N/A	A25 Series	