

PUSH BUTTON IN HEAD TEMPERATURE TRANSMITTERS

SEM203 Series

- SIMPLE PUSH BUTTON CONFIGURATION
- HIGH STABILITY
- INPUT/OUTPUT ISOLATION
- 4 TO 20 mA TWO WIRE OUTPUT
- PROGRAMMABLE BURNOUT
- USER PUSH BUTTON TRIM
- 10 YEAR WARRANTY



INTRODUCTION

The SEM203 is a cost effective “smart” in head transmitter that accepts various temperature sensors and converts sensor output over a configured range to a standard industrial 4 to 20 mA transmission signal.

The SEM203 in head transmitter incorporated the latest digital technology to ensure accurate drift free performance. A simple push button operation allows the user to not only select the desired range and burnout direction but also perform user trim at both 4 and 20 mA points without the use of a computer.

If required, the desired range can be specified at the time of order, eliminating the need for user configuration. If the range is not specified then the transmitter will be shipped with the factory default range. In any case the following parameters are field configurable:

MODEL	INPUT TYPE	DEFAULT RANGE	LOW RANGE	HIGH RANGE	BURNOUT	USER TRIM
SEM203TC	T/C: K, J, E, N, T, R, S, mV	0 to 1,000°C Type “K”	Input @ 4 mA	Input @ 20 mA	Up/Scale or Down/Scale (Up/Scale is Standard)	Available when Configuring Unit
SEM203P	RTD: Pt100 (2 or 3 wire) (Pt500 or Pt1000 also available)	0 to 100°C				
SEM203N	RTD: 120Ω Nickel	0 to 100°C				
SEM203TH	Thermistor: 2,252Ω or 10KΩ	0 to 100°C				

INPUTS

MODEL	INPUT	RANGE	MIN. SPAN	ACCURACY (Note 1)	STABILITY	O/C	CJ (Note 3)	SENSOR EXCITATION (Note 4)
SEM203TC	K	-328 to 2498°F	20°F	±0.1% of FSR ±0.9°F	Zero 0.18°F/°F Span 0.09°F	Yes	Yes	N/A
	J	-148 to 2192°F						
	E	-328 to 1832°F						
	N	-292 to 2372°F						
	T	-328 to 752°F						
	R	14 to 3200°F						
	S	14 to 3200°F						
	mV	-10 to 70mV	0.5 mV	±0.02% FSR	Zero 1µV/0.18°F Span 75 ppm/0.18°F	N/A	N/A	
SEM203P	Pt100	-328 to 1562°F (18 to 390Ω)	45°F	±0.18°F/ ±0.05% of Rdg	±0.005% of FSR	Yes	N/A	<200µA
SEM203N	120ΩNi	-112°F to 500°F	10°F	±0.18°F/ ±0.1% of Rdg	Zero ±0.01°F/°F Span 50ppm	Yes	N/A	1mA
SEM203TH-1	2,252Ω	-13 to 257°F (Note 5)	10°F	±0.25°F (32 to 212°F)		Yes	N/A	240µA
SEM203TH-2	10KΩ			±0.35°F (-13 to 257°F)		Yes	N/A	100µA

Key: Rdg = Reading; FSR = Full Scale Range; O/C = Programmable Open Circuit Sensor Detect; CJ = Cold Junction Error

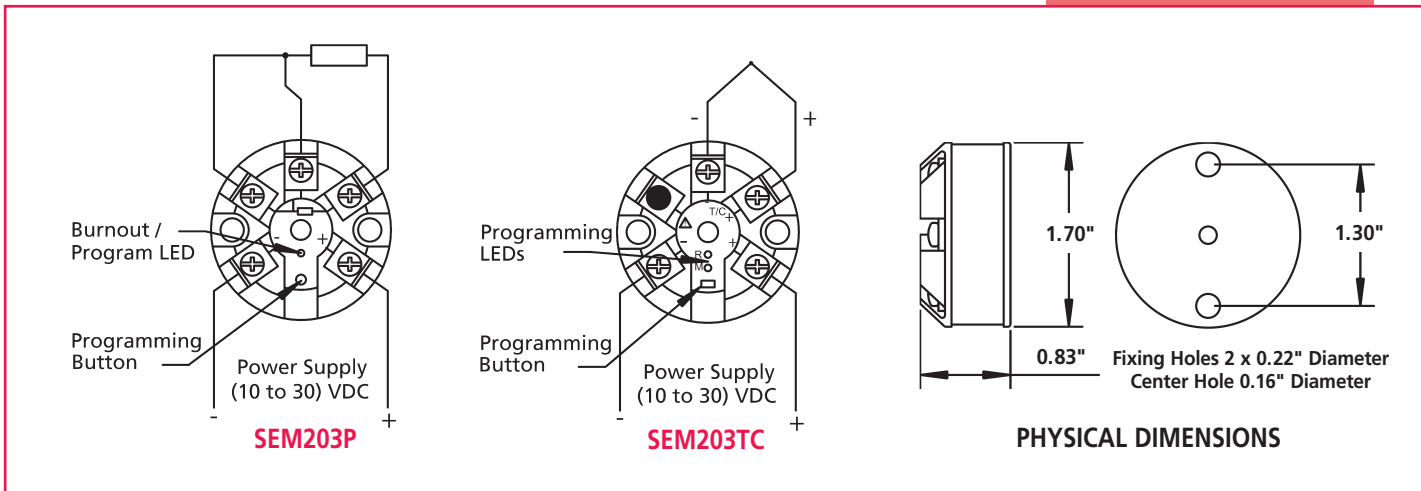
- Notes:
1. Accuracy for Pt100 and T/C do not include sensor and cold junction errors.
 2. Only over the range 1472 to 2912°F.
 3. Cold junction range: -4 to 185°F, Accuracy: ±0.9°F, Tracking: ±0.09°F.
 4. Pt100 Input Maximum lead resistance: 20R, Lead effect: 0.027°F/Ω.
 5. For Thermistors with resistance curve having a ratio of 9.07 between 0 to 50°C.

GENERAL

Update Time	500 mS
Response Time	1 second
Start Up Time	4 seconds (Output < 4mA during start-up)
Warm Up Time	1 minute to full accuracy
Power Supply	10 to 30 VDC
Isolation	Input to output tested at 250VDC (T/C version only)
Ambient	Operating: -40 to 185°F, 10 to 90% RH non condensing. Storage: -58 to 194°F.
Approvals	CE tested to BS EN 61326 (Sensor input wires to be < 3 meters to comply)
Material	ABS
Flammability	UL94V040

MECHANICAL

Dimensions	1.68" diameter; 0.83" height
Weight	31 grams (encapsulated)
Terminals	Screw terminals
Cable	2.5 mm maximum



SEM203 OUTPUT

Type	Two wire current loop; signal range 4 to 20mA; full range 3.8 to 21.5mA
Calibration Accuracy	(mA output / 2000) or $\pm 5\mu\text{A}$ (which ever is greater)
Loop Voltage Effect	$\pm 0.2 \mu\text{A} / \text{V}$
Thermal Drift	$\pm 1 \mu\text{A} / ^\circ\text{C}$
Protection	Reverse polarity protection.
Maximum Output Load	$[(\text{Vsupply}-8)/22]$ K ohms (Example: 700 ohms @24V)

ORDER CODES:

SEM203TC	UNIVERSAL THERMOCOUPLE INPUT
SEM203P	100 Ω PLATINUM RTD INPUT
SEM203P-500	500 Ω PLATINUM RTD INPUT
SEM203P-1000	1000 Ω PLATINUM RTD INPUT
SEM203N	120 Ω NICKEL RTD
SEM203TH-1	2,252 Ω THERMISTOR INPUT
SEM203TH-2	10K Ω THERMISTOR INPUT
DM710	INDICATING TEMPERATURE TRANSMITTER
DM700I	LOOP POWERED LED INDICATOR
Accessories	
RMK-2	DIN RAIL ADAPTER CLIP

Local Representation



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