



Features

- Choice of 2-1/4", 4", 6" or 8" digit heights, 4 digits.
- Choice of normal or outside viewing brightness
- Choice of panel mount, wall mount or suspension mount.
- Choice of 95-264 Vac or 11-30 Vdc power.
- Optional front panel programmable analog output, dual 5A relays, and serial data output.
- Standard PC programmable analog output and dual 120 mA AC/DC solid state relays.
- Sealed to NEMA-4 (IP65).
- Only 3.0" (75 mm) deep.

Description

MAGNA Series Large Digit Temperature Displays can be ordered for four RTD types (DIN Pt100, ANSI Pt100, nickel or copper), or for seven thermocouple types (J, K, T, E, N, R, S). Four red LED digits show temperatures in °C or °F and 1° or 0.1° resolution.

Viewing distances up to 320 ft (100 m) are achieved with large digits for reading across a plant floor or an outdoor yard. Four digit heights are available: 57 mm (2-1/4"), 102 mm (4.0"), 150 mm (5.9"), and 200 mm (7.9"). A rule of thumb is that viewing distance in feet is 40 times digit height in inches, or in metric terms, that viewing distance in meters is digit height in millimeters divided by 2. Segmented digits are used for normal brightness 2-1/4" and 4.0" digits. Individual 5 mm LED pixels are used for larger digits and for outdoor brightness versions.

The display consists of a MAGNA serial input display and a Laureate temperature transmitter with a streaming RS485 output. The transmitter can be mounted inside or outside of the display housing,

as ordered. Remote transmitter mounting allows long RS485 cable runs while keeping the RTD or thermocouple leads short.

Environmental sealing to IP65 (NEMA-4X) is standard. Electrical connections are via water-tight compression glands. A built-in heater is optional for outdoor operation down to -25°C. Mounting options are panel mount, wall mount or suspension mount.

Optional outputs are an isolated analog output, dual 5A relays for alarm or control, and an RS232 or RS485 serial data output. These options are implemented by add-on boards and are programmable from the display's front panel keypad.

Standard outputs that come with the Laureate transmitter are an isolated analog output and dual 120 mA solid state AC/DC relays. Their setup requires connection to a PC via the transmitter's RS485 port, and it uses Laurel's free Instrument Setup Software.



A Laureate RTD or thermocouple transmitter can be mounted inside or outside of the display housing.

Specifications

Display	
Readout	4 red LED digits
Digit Height	57 mm (2-1/4"), 102 mm (4.0"), 150 mm (5.9"), or 200 mm (7.9")
Brightness	Indoor or outdoor brightness as ordered. Five keypad adjustable brightness levels.
Power	
AC Power (standard)	100-240 Vac
DC Power (optional)	11-30 Vdc
Max Consumption	30 VA
RTD Input (if ordered)	
Calibration, Pt 100 DIN	Per IEC 751 (ITS-90)
Calibration, Pt 100 ANSI	NIST Monograph 126
Calibration, Ni 120	DIN 43760
Max error at 25°C, Pt100	± 0.04°C (±0.07°F) ± 0.01% of reading
Span tempco	± 0.003% of reading/°C
Zero tempco	± 0.03 deg/deg
Provision for calibration	Multiplier of RTD resistance plus offset in degrees
Connection	2, 3 or 4-wire



Overvoltage protection		125 Vac				
Open sensor indication		0 mA or > 20mA output, user selectable				
Sensor lead resistance		2-wire, 10 mdeg/Ω/deg up to 10Ω				
Tempco per conductor		3 & 4-wire, 10 mdeg/Ω/deg up to 100Ω				
RTD Metal	Alpha	R at 0°C	R at top of range	Excitation Current	Range	Conformity Error
Platinum	0.003850 (DIN)	100Ω	390.48Ω at 850°C	196 μA	-200°C to +850°C -328°F to +1562°F	±0.03°C ±0.05°F
Platinum	0.003902 (ANSI)	100Ω	394.36Ω at 850°C	196 μA	-200°C to +850°C -328°F to +1168°F	±0.04°C ±0.07°F
Nickel	0.00672	120Ω	380.31Ω at 260°C	196 μA	-80°C to +260°C -112°F to +500°F	±0.05°C ±0.09°F
Copper	0.00427	9.035Ω	19.116Ω at 260°C	5.0 mA	-97°C to +260°C -143°F to +500°F	±0.05°C ±0.09°F
Thermocouple Input (if ordered)						
Calibration		NIST Monograph 125 (IPTS-68)				
Overall Accuracy at 25°C		±0.01% of full span ± conformity error				
Span Tempco		±0.003% of reading/°C				
Reference Junction Accuracy		0.5°C, 10°C to 40°C				
Span Tempco		±0.003% of reading/°C				
Input Resistance		1 GΩ				
Input Current		100 pA				
Max Lead Resistance		1 kΩ max for rated accuracy				
Overvoltage Protection		125 Vac				
NMR at 50/60 Hz		80 dB plus selectable digital filter				
CMR, DC-60 Hz		120 dB with 500 ohm imbalance				
CMV, DC-60 Hz		250 Vac from power and earth grounds				
Thermocouple Types		Thermocouple Range			Conformity Error	
J		-210°C to +760°C (-347°F to +1400°F)			±0.09°C (±0.16°F)	
K		-244°C to +1372°C (-408°F to +2501°F)			±0.1°C (±0.17°F)	
T		0°C to +400°C (32°F to 752°F) -257°C to 0°C (-430°F to +32°F)			±0.03°C (±0.05°F) ±0.2°C (±0.36°F)	
E		-240°C to +1000°C (-400°F to +1830°F)			±0.18°C (±0.32°F)	
N		-245°C to +1300°C (-410°F to +2370°F)			±0.10°C (±0.17°F)	
R		-45°C to +1768°C (-49°F to +3214°F)			±0.17°C (±0.31°F)	
S		-46°C to +1768°C (-51°F to +3213°F)			±0.12°C (±0.22°F)	
Analog Output (with option board)						
Output Levels		0-20 mA or 4-20 mA into 0 to 500 Ohms, 0.4 μA resolution. 0-10V into loads > 600Ω, 0.2 mV resolution. -10 to +10V into loads > 600Ω, 0.4 mV resolution.				
Resolution		16 bits				
Accuracy		0.1% of range				
Stability		50 ppm/°C				
Output Isolation		Isolated from input and power				
Scaling		From front panel keypad				
Special Features		Forward or reverse action possible				
Relay Outputs (with option board)						
Relay Type		2 Alarms rated 5A, 250VAC, SPDT				
Relay Setup		From front panel keypad				
Special Features		Adjustable hysteresis Manual or automatic in-flight compensation. Energize or de-energize on trip. Adjustable timers to set energize and de-energize delays. In-band and out-of-band alarm function.				
Serial Data Output (with option board)						
Output Types		RS232 or RS485, addressable, on demand or continuous output.				

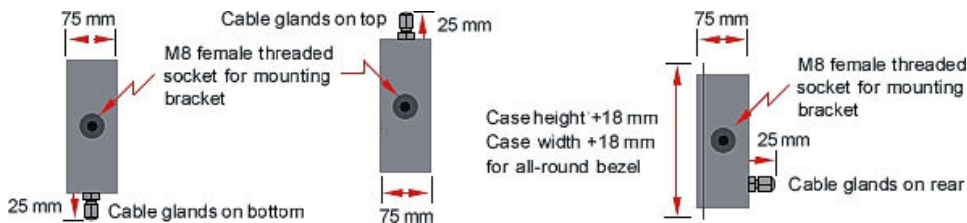


Special Features	Can include time and date with RTC option fitted.
Analog Output (standard from transmitter)	
Output Levels Output Isolation Output Error Compliance at 20 mA Compliance at 10V Output Isolation Step Response Time	4-20 mA, 0-20 mA, 0-10 Vdc, -10 to +10Vdc (user selectable) 16 bits (65,536 steps) ±0.02% of output span ± overall input error 10V (0-500Ω load) 2 mA (5 kΩ load or higher) 250V rms working, 2.3 kV rms per 1 minute test 100 ms
Relay Outputs (standard from transmitter)	
Relay Type Load Rating Special Features	Two solid state relays, SPST, normally open, Form A 120 mA at 140 Vac or 180 Vdc Actuate above or below setpoint, latching or non-latching, disabled Span hysteresis, split hysteresis, deviation band around setpoint Programmable output time delay, 1 to 128 readings
Environmental	
Storage Temperature Operating Temperature Sealing Electrical Connections Mounting	-20°C to +55°C 0°C to 50°C, non-condensing. -25°C to 50°C, non-condensing, with MHTR AC heater option. NEMA-4 (IP65) standard, all-round Via hermetically sealed compression glands Wall mount, suspension mount, or panel mount

Number of Digits & Case Dimensions



Display Format	8888
Digit height	Case width x height
57 mm (2.2") digits	376 x 155 mm (14.8" x 6.1")
102 mm (4.0") digits	434 x 196 mm (16.7" x 7.7")
150 mm (5.9") digits	514 x 247 mm (20.2" x 9.8")
200 mm (7.9") digits	664 x 298 mm (26.1" x 11.7")
Case depth	75 mm (3.0")



Notes: Models with 57 mm (2.2") digits come with the larger 6-digit case.
For panel mount versions, add 18 mm (0.7") to case width and height for the bezel and 25 mm (1.0") for cable glands in back of the case.

Ordering Guide

Create a model a model number in this format: **M84-P385C-MAO1-MT2**

Base Model	<p>M24UM 2" (57 mm) digit height, 4 digits. Display to 8.8.8.8. M44 4" (102 mm) digit height, 4 digits. Display to 8.8.8.8. M64 6" (150 mm) digit height, 4 digits. Display to 8.8.8.8. M84 8" (200 mm) digit height, 4 digits, Display to 8.8.8.8.</p>
Signal Input	<p>P385C Pt100 DIN RTD, -202°C to 850°C P385F Pt100 DIN RTD, -331°F to 1562°F P392C Pt100 ANSI RTD, -202°C to 631°C P392F Pt100 ANSI RTD, -331°F to 1168°F N672C Ni120 RTD, -100°C to +260°C N672F Ni120 RTD, -148°F to +500°F C427C Cu10 RTD, -100°C to +260°C C427F Cu10 RTD, -148°F to +500°F</p> <p>Note: The same RTD signal conditioner can be user configured for all RTD types listed and °C or °F, as well as for resistance ranges 0 to 20, 200, 2K, 20K, 200K ohms. Indicate if signal conditioner is to be inside main housing or remote.</p> <p>JC Thermocouple Type J, -210°C to 760°C JF Thermocouple Type J, -347°F to 1400°F KC Thermocouple Type K, -347°C to 1372°C KF Thermocouple Type K, -408°F to 2501°F TC Thermocouple Type T, -257°C to 400°C TF Thermocouple Type T, -430°F to 752°F EC Thermocouple Type E, -240°C to 1000°C EF Thermocouple Type E, -400°F to 1830°F NC Thermocouple Type N, -240°C to 1000°C NF Thermocouple Type N, -410°F to 2370°F SC Thermocouple Type S, -46°C to 1768°C SF Thermocouple Type S, -51°F to 3214°F RC Thermocouple Type R, -45°C to 1768°C RF Thermocouple Type R, -49°F to 3213°F</p> <p>Note: The same signal conditioner can be user configured for all thermocouple types listed and °C or °F. Indicate if signal conditioner is to be inside main housing or remote.</p>
Analog Output Board (one optional)	<p>MAO1 4-20 mA MAO2 0-10V MAO3 -10V to +10V</p> <p>Note: Front panel programmable. At time of order, specify factory default reading for top and bottom of output range.</p>
Relay Output Board (one optional)	<p>MRL1 Two 5A, 250 Vac relays MRL2 Four 5A, 250 Vac relays</p>
Serial Data Output Board (one optional)	<p>MO232 RS232 MO485 RS485 with Modbus ASCII</p>
Standard Outputs (included with transmitter)	<p>- Isolated 4-20 mA, 0-20 mA, 0-10V, -10 to +10V analog output, and two 120 mA AC/DC solid state relays. Requires PC for programming.</p>
Case and Mounting (one required)	<p>MT1 Panel mount, black NEMA-4 (IP65) case MT2 Wall mount, black NEMA-4 (IP65) case MT3 Suspension mount, black NEMA-4 (IP-65) case</p>
Meter Modifying Options (not shippable separately from meter)	<p>MRDLV Daylight viewing brightness instead of normal indoor brightness MHTR AC heater for operation down to -25°C (-13°F) MPS2 11-30 Vdc power instead of normal 85-265 Vac power</p>