Strain/ Microvoltmeter Indicator/ Controller

⅛ DIN

Q2000-S Series

- Adjustable 1 to 10 Vdc Bridge Excitation Supply
- ±1999 or ±9999 Count Display Span
- Seven Overlapping Gain Ranges
- Front-Panel Accessible Zero and Span Adjustments
- Resolution Down to 1 or 2 µV/Count
- Strain-Gauge Sensitivity Down to 0.20 mV/V
- Ratiometric Measurement
- 1 or 0.2 mV/Count Analog Output
- LED or LCD Display
- Automatic Polarity
- Display Hold and Test
- Screw-Terminal Barrier Strip

Q2000-S
Meter shown smaller than actual size.

The Q2000/9000-S is a meter/controller for use with pressure transducers and load cells which require bridge excitation and preamplification of microvolt signals. Deadload and tare adjustments make it suitable for weighing applications. Like process meters, it provides zero and span adjustments for direct readout in engineering units. It can also be used as a microvoltmeter with differential input. A universal ⅛ DIN case houses each meter. Choose any combination of display type (LED or LCD), operating power, input type and range, analog output, and digital or control outputs.

Excitation Supply and Preamplifier
The Q2000/9000-S provides a constant-voltage excitation supply, which is adjustable from 1 to 10V and can drive up to 30 mA. It also provides a high-impedance preamplifier, which is continuously adjustable so that signal levels from ±2.0 to ±500 mV can produce the full-scale display of ±1999 or ±9999 counts. At 10V excitation and maximum gain, full-scale readout can be obtained with strain-gauge sensitivity as low as 0.20 mV/V. An active filter is provided for noise reduction.

Bridge Connection
Bridges can be connected by 4 or 6 wires. In 6-wire connection, two lines sense the voltage applied to the bridge and compensate for lead resistance.

Resolution and Accuracy
Resolution for Q2000-S is one part in ±1999 counts, or 0.05% of full scale. Resolution for Q9000-S is one part in ±9999 counts, or 0.01% of full scale. Accuracy is 99.9% of reading. The measurement is ratiometric to reduce errors due to temperature and power-line variations. The same internal reference controls the meter gain and the excitation level.

Specifications

Gain Adjustment: Seven overlapping ranges with fine adjustment
Input Configuration: Differential, ratiometric
Zero Adjustment: ±225 µV/volt of excitation
Span Adjustment: 1 to 2.47 of preamp gain
Bias Current: 11 nA typ, 22 nA max

Noise Rejection

CMR, SIG GND to SIG LO: 80 dB, DC to 60 Hz
CMV, SIG GND to SIG LO: ±1 V, DC to 60 Hz
CMR, SIG GND to PWR GND: 120 dB
CMV, SIG GND to PWR GND: 1500 Vp per HV test, 354 Vp per IEC spacing

Accuracy at 25°C

Error, Maximum ±0.05% of reading ±1 count (Q2); ±0.05% of reading ±2 counts (Q9**)**
Span Tempco: ±0.01% of reading/°C
Zero Drift, Maximum: ±0.3 µV/°C
Offset Drift, Maximum: ±(0.01% offset V ±0.01% FS V)/°C
Step Response: 1 s to 99.9% of span
Warmup to Rated Accuracy: 30 min (Q2); 60 min (Q9)

Excitation

Configuration: Constant-voltage
Voltage Sense: Internal or remote
Voltage Range: Adjustable from 1 to 10V
Load Current, Maximum: 30 mA

Conversion

Technique: Auto-zero, dual slope, average value
Signal Integration Period: 100 ms, nominal
Reading Rate: 2.5/s, nominal

Display
LED: Red, 14.2 mm (0.56"), 7-segment
LCD: 12.7 mm (0.50"), 7-segment

Power
AC Models: 120, 240 or 24 Vac +10%/-15%, 49 to 440 Hz
DC Models: 9 to 32 Vdc, isolated to 300 Vp; 26 to 56 Vdc, isolated to 300 Vp; 5 Vdc ±5%, non-isolated

Common Mode
Rejection: 120 dB

Environmental
Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Humidity: 95% RH, non-condensing @ 40°C (104°F)

Mechanical
Bezel: 96 W x 48 H x 8 mm D (3.78 x 1.89 x 0.31")
Depth Behind Bezel: 139.8 mm (5.50")
Panel Cutout: 92 W x 45 mm H (3.62 x 1.77")
Weight: 17 oz (480 g)
Case Material: 94V-0 UL-rated polycarbonate

Analog Input	Q2000S Most-sensitive Scaling	Q9000S Most-sensitive Scaling	Q2000S Least-sensitive Scaling	Q9000S Least-sensitive Scaling
Range	±2.0 mV	±2.0 mV	±500 mV	±500 mV
Resolution	1.0 µV/count	0.2 µV/count	250 µV/count	50 µV/count
Preamplifier Gain	405	405	4.01	4.01
Post-amplifier Gain	2.47	2.47	1.00	1.00

To Order ***Visit newportUS.com/q2000s for Pricing and Details***						
Model No.						**Description**
Q2	**3½-Digit for ±1999 Count**					
Q9	**4-Digit for ±9999 Count**					
	0	**0**	**0**	**-X**		**A. Power and Display**
	0					LED; 120 Vac (50/60 Hz)
	1					LCD; 120 Vac (50/60 Hz) (Q2000 only)
	2					LED; 240 Vac (50/60 Hz)
	3					LCD; 240 Vac (50/60 Hz) (Q2000 only)
	4					LED; 9 to 32 Vdc, isolated
	5					LCD; 9 to 32 Vdc, isolated (Q2000 only)
	6					LED; 5 Vdc
	7					LCD; 5 Vdc (Q2000 only)
	8					LED; 24 Vac
	9					LCD; 24 Vac (Q2000 only)
	A					LED; 26 to 56 Vdc, isolated
	B					LCD; 26 to 56 Vdc, isolated (Q2000 only)
						B. Analog Outputs
		0				1 mV/count (Q2000) or 0.2 mV (Q9000) (supplied on all units)
		1				0 to 5 Vdc
		2				0 to 10 Vdc
		3				0 to 1 mA (internally driven)
		4				4 to 20 mA (internally driven)
		5				4 to 20 mA (externally driven)
		6				4 to 20 mA (isolated)
						C. Control Outputs
			0			None
			1			Dual setpoint, 10 A relay (SPDT)
			2			Proportional 4 to 20 mA
			3			Proportional/time proportioning, 2 A relay
			4			Parallel BCD, isolated
			5			Single setpoint, 10 A relay (SPDT)
						D. Signal Conditioner Inputs
				-S		Strain gage
						Additional Options
					,FS	Custom Calibration. Specify in mV: min/max input, min/max display and excitation of 1 to 10 Vdc
					,G	Green LED display
					,BL	Lens without Newport logo in lieu of standard lens

** Refer to chart above for code options.*
Ordering Example: Q2000-S, *3½ digit strain gage meter, red LED, 120 Vac power, 1 mV/count.*