

**3 3 0 R**



**POWERS 330R**

### INTELLIGENT 1/8 DIN PROCESS MONITOR

- ▶ Universal Input
- ▶ Digital Indicator
- ▶ Trip/Alarm
- ▶ Analog Transmitter
- ▶ Digital Transmitter

**POWERS**

A unit of **CRANE** Co.

The 330 Process Monitor is an entirely new design. The operation of the instrument's keys and the wiring of the rear terminals is different than found on the 320. In addition, a 320 chassis may not be used in a 330 case. To insure proper use and installation, please review the manual before using.

## DESCRIPTION



The Powers 330 is a process monitor with universal input that is multi-functional and microprocessor based. The 330 can function as a panel meter and trip (alarm), or as a panel meter with two trips (alarms), analog transmitter and digital transmission with the addition of the RS 485 serial communications option.

Designed for reliability, the 330 features a splashproof front panel that meets NEMA 4X specifications. Non-volatile EEPROM memory preserves configurations in the event of shutdowns or power outages. This design for reliability extends to construction that makes it highly resistant to electrical noise and vibration. Before shipment, all units are tested under power for thermo shock and vibration.

The 330 is available in two formats to maximize flexibility.

### Standard Configurations

- One alarm output (5 Amp Mechanical Relay)
- Two alarm outputs (5 Amp Mechanical Relay)  
One retransmission (Milliamp) or loop power output
- Two alarm outputs (5 Amp Mechanical Relay)  
One retransmission (Milliamp) or loop power output
- RS-485 Communications

### Field-Upgradable Modular Output Configuration

Starting with the 300R0000 and the addition of plug in option boards and modules, the 330's capabilities increase dramatically

### Option Boards:

- Loop Power
- Loop Power and Digital Input
- 10 Volt Excitation and Digital Input

### Option Board Modules:

- Second loop power or mA retransmission.
- Second alarm output consisting of one of the following:
  - 5 amp relay,
  - 1 amp solid state relay
  - DC logic (SSR) drive
- RS-485 Serial communications module

\* See ordering information on page 4 to configure model number

## FEATURES

- Mnemonic-prompted set up simplifies configuration procedure.
- User selectable inputs simplify ordering, set up, and stocking requirements.
- Non-volatile memory via EEPROM backup stores set up configurations in event of power loss.
- Raised rubber keys yield much longer life than dome type keys and provide excellent tactile feedback. NEMA 4X instrument front.
- Large LED display creates a highly visible readout.
- Communications link—optional RS-485 interface allows supervision by higher level devices and combines function of local readout and digital transmitter.
- Square root linearization results in accurate measurement from flow transmitters with non-linear outputs, saving the expense of a separate square root extractor.
- User-definable 15-point linearization allows customized linearization of the input signal for highly accurate measurements in engineering units. Among this feature's applications is the conversion of level readings into volume for irregularly-shaped receptacles (not available for thermocouple or RTD inputs).
- Selectable digital input filtering provides for a more stable display of "noisy" processes.
- Peak and valley (maximum and minimum) readings are stored in memory and displayed on request for indication of process extremes.
- Each alarm (two can be specified) is fully independent. Each may be configured for high and low setpoints and a variety of latching sequences, including the common limit switch sequence, dead band, and power-up state.

## OPTIONS

- 24Vdc loop power supply simplifies transmitter wiring and eliminates need for an expensive, separate transmitter power supply.
- User-scaleable analog outputs for transmission of the linearized process variable allows the monitor to be used as an analog transmitter and is valuable for data acquisition.
- Second relay provides an additional independent alarm output.
- 10V excitation voltage provides power to bridge inputs.

## SPECIFICATIONS

### Accuracy

All accuracy ratings are at reference conditions (at least 30 min. at 25 °C)

Thermocouple Inputs:  $\pm 0.15\%$  of span typical  $\pm 1$  digit

RTD Inputs:  $\pm 0.10\%$  of span typical  $\pm 1$  digit

Millivolt/Voltage/Current Inputs:  $\pm 0.05\%$  of span typical  $\pm 1$  digit

Resolution: 0.004% of span typical

### Architecture

The 330 hardware can be configured as follows:

Inputs: One universal process variable input is standard.

Available options include digital input.

Outputs: Up to 3 outputs are available, plus transmitter loop power or stain gage excitation voltage.

RS-485 Communications: Available as an option.

### Process Variable Inputs

1 Universal input. Any input type may be in the field via the front panel or communications.

Thermocouples	Range °F	Range °C
B	104 to 3301	40 to 1816
E	-454 to 1832	-270 to 1000
J	-346 to 1832	-210 to 1000
K	-418 to 2500	-250 to 1371
N	-328 to 2372	-200 to 1300
R	32 to 3182	0 to 1750
S	32 to 3182	0 to 1750
T	-328 to 752	-200 to 400
W (G)	32 to 4172	0 to 2300
W5 (C)	32 to 4172	0 to 2300
Platinel II	-148 to 2550	-100 to 1399
RTD's	Range °F	Range °C
100Ω Pt. (DIN)	-328 to 1562	-200 to 850
	-328.0 to 545.0	-200.0 to 285.0
100Ω Pt. (JIS)	-328 to 1202	-200 to 650
	-328.0 to 545.0	-200.0 to 285.0

### Current, Voltage, or Millivolt Signals

Milliamps DC 4 to 20, 0 to 20

Volts DC 1 to 5, 0 to 5

Millivolts DC -30 to 30, 0 to 30, 0 to 60, 0 to 100

### Input Signal Failure Protection

Thermocouple inputs are configurable for upscale or downscale burnout; RTD inputs fail upscale if any leg is broken.

### Input Impedance

Current Input: 100Ω

Voltage Input: 10MΩ typical

RTD or Thermocouple Input: 100 MΩ typical

Millivolt Input: 100 MΩ typical

### Input Filter

A single pole lowpass filter with selectable time constants from 0.0 to 120.0 seconds is available.

### Input Linearization

Square root linearization is available. Each thermocouple or RTD input is automatically linearized. The PV input may use 15 point user-definable linearization if it is a voltage, millivolt or milliamp input.

### Contact Input

External dry contact input or open-collector transistor input for alarm acknowledgement, peak/valley reset or keyboard lockout. Isolated from process variable input and digital circuitry.

### Memory

Non-volatile EEPROM.

### Transmitter Loop Power or Excitation Voltage

Loop power capacity is 40mA at 24VDC. Excitation voltage is 10VDC  $\pm 2\%$  into at least 175 ohms.

### Sampling Rate

Input sampled 12 times per second (every 83.3 msec).

### Digital Displays

Green LED display is 4-digit, 7 segment, 0.56" (14.3mm) high. Range is -999 to 9999. Assignable decimal position with current, voltage, or millivolt inputs.

### Mounting

Panel-mounted with a depth of 6.14 inch (156 mm).

### Wiring Connections

Screw terminals on the rear of case.

### Power Consumption

24 VA maximum.

### Weight

Approx. 1.0 lbs (0.45 kg).

### Ambient Temperature

Operative Limits: 32 to 122 °F (0 to 50 °C)

Storage: -40 to 185 °F (40 to 85 °C)

### Relative Humidity

10 to 90% at 40 °C (104 °F), non-condensing.

### Analog Retransmission Output

Either 0-20 mA, 4-20mA, 20-4mA or 20-0mA (front panel selectable) into a load up to 1000Ω. Accuracy  $\pm 20\mu$  A @25 °C.

### Mechanical relays

SPDT electromechanical relay. Resistive load rated at 5 amps at 120/240VAC. Normally open or normally closed selection is made by jumper.

### Solid state relay (triac) module

Resistive load rated at 1 amp at 120/240 VAC.

### DC logic (SSR drive) module

"ON" voltage is 17 Vdc (nominal). "OFF" voltage is less than 0.5 Vdc. (Current limited to 40mA.)

### Voltage

90 to 250 VAC

### Frequency

50/60  $\pm 2$  Hz

**Serial Communications**

Isolated, bidirectional, two wire, half-duplex RS-485 serial interface. 1200 to 19,200 baud rate. Selectable CRC data checking. Protocol allows access to every operation and configuration parameter.

**Construction**

Case: Polylac PA-765 ABS, 94V-0 Rated  
 Bezel: GE LEXAN® 500, 94V-0 Rated  
 Keys: Silicone rubber with diffusion printed graphics  
 NEMA Rating: Front panel rated NEMA 4X when instrument is properly installed

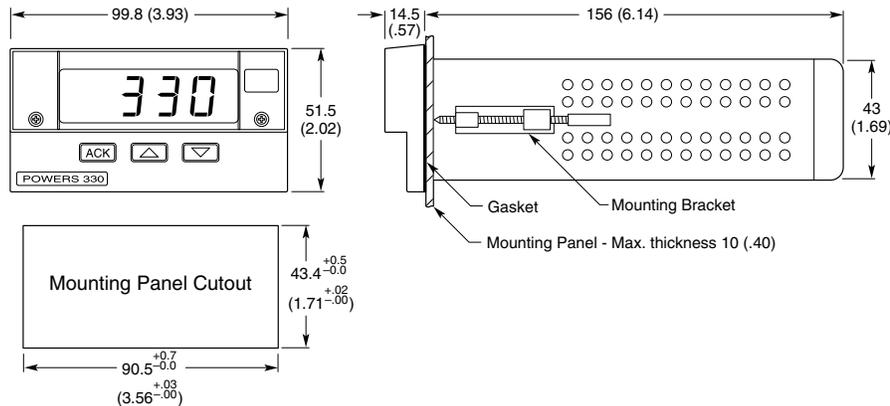
**Security**

Two levels of access are available: restricted and full. A user-configurable code is used to enter the full access level.

**Calibration**

Comes fully calibrated from the factory. Field calibration can be easily performed in the field with a precision multimeter and input simulator. Process variable offset and gain factors are provided to correct for sensor errors.

**DIMENSIONS**



**ORDERING INFORMATION**

**Standard Configurations**

- One Alarm Output (5 Amp Mechanical Relay) \_\_\_\_\_ **330R0000**
- Two Alarm Outputs (5 Amp Mechanical Relays)  
 One Retransmission (Milliamp) or Loop power Output \_\_\_\_\_ **330RD000**
- Two Alarm Outputs (5 Amp Mechanical Relay)  
 One Retransmission (Milliamp) or Loop Power Output  
 RS-485 Communications \_\_\_\_\_ **330RD00X**

**Field-Upgradable Modular Output Configuration**

<b>Alarm Output:</b>	5 Amp Mechanical Relay (standard) _____	<b>330R</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Option Board:</b>	Loop Power _____	<b>A</b>				
	Loop Power and Digital Input _____	<b>B</b>				
	10 Volt Excitation and Digital Input _____	<b>C</b>				
<b>Option Board Modules:</b>						
<b>Analog Output:</b>	Loop Power #2 _____	<b>L</b>				
	Retransmission (Milliamp) _____	<b>M</b>				
	None _____	<b>O</b>				
<b>Second Alarm Output:</b>	5 Amp Mechanical Relay _____	<b>R</b>				
	1 Amp Solid State Relay (Triac) _____	<b>S</b>				
	DC Logic (SSR Drive) _____	<b>T</b>				
	None _____	<b>O</b>				
<b>Serial Communications:</b>	RS-485 Communications _____	<b>X</b>				
	None _____	<b>O</b>				

**POWERS**

A unit of CRANE Co.

© April 1999 Powers Process Controls, a Unit of Crane Co.

3400 Oakton Street, Skokie, IL 60076 Phone: 847.673.6700 • Fax: 847.673.9044

4540 Dixie Road, Unit C, Mississauga, Ontario L4W 1N2, Canada • Phone: 905.238.4855 • Fax: