

# 1/8 DIN Temperature/Process Meter/Scanner

## With Data Logging and RS232 Communications

### DP470 Series



- ✓ Single- and Multiple-Input Models
- ✓ Thermocouple, RTD, and Process Input Models
- ✓ Selectable 0.1/1° Resolution
- ✓ Selectable Digital °C/°F Temperature Units
- ✓ 4-Digit, 14-Segment Alphanumeric Display
- ✓ RS232 Communications Standard
- ✓ Captures Minimum and Maximum Readings
- ✓ Free Windows-Based Software (Compatible to Windows® XP)
- ✓ View all Channel Data, Alarm Status, and Min/Max Values Simultaneously
- ✓ Log Real-Time Data
- ✓ Create Exportable Data Files

The DP470 Series of single- and multiple-input digital temperature and process indicators sets a standard for performance, features, value, and reliability. With built-in digital programmability, communications, and powerful Windows-based software, the DP470 is ideal for monitoring, testing, and process-control applications. Complete configuration of the instrument can be quickly performed from the front panel, including designating sensor input type, sampling rate, limit settings, and resolution. Display of process and min/max values is also user selectable from the front panel. The standard single-input model features easy-to-use front-panel configuration and display of temperature or

DP470-T-C2  
shown larger  
than actual size.



process measurement with either 0.1 or 1° resolution, min/max values, and limit conditions.

#### Windows®-Based RS232 Communications Software

The DP470 is far more than a stand-alone, high-performance digital temperature or process indicator. Thanks to the exclusive DP470 software, the DP470 is a powerful real-time data monitoring, control, and data logging system. Clear, menu-driven displays guide the user through instrument setup and allow the monitoring, collection, and logging of data remotely through a PC serial port. Software alarms, channel ID, and min/max values are presented, along with a simulated LED display of the selected channel, in an on-screen control panel format. In addition, data can be exported as text to create graphs and print hard-copy reports. **(No Protocol is available).**

#### Multiple Inputs

With the multiple-input model installed, the DP470 Series can monitor up to 6 thermocouple or process inputs or 3 RTD channels. On single-input models, an optional board can be installed. This board provides enhanced alarm functions as well as a scalable 4 to 20 mA/0 to 10V analog output.

All active inputs can be manually selected or automatically scanned. A front-panel channel indicator accompanies the displayed data. Individual limits can be assigned to each channel. A built-in 5 A rated form "C" relay is energized whenever the limit on the selected channel is exceeded.

#### Dual Alarms

With the dual-alarm model, the DP470 can be configured to perform on/off control functions as well as process monitoring. Setpoints can be set for high, low, or deviation. In addition, hysteresis (deadband) and delay can be programmed into each setpoint. Alarm conditions can be programmed for manual acknowledgment or for automatic reset. The dual-alarm option comes equipped with two 5 A rated form "C" (SPDT) relays, one for each alarm setpoint. A flashing display alerts the user to an alarm condition.

#### Analog Output Models

Analog output capability is also available in combination with the dual alarm option. A linearized output (4 to 20 mA or 0 to 10V) with fully adjustable zero and span allows the instrument to serve as an indicating transmitter, or as a high-level input to a PC-based converter or other recording device.

## Specifications

**Power:** 100 to 240 Vac ( $\pm 10\%$ ),  
50 to 400 Hz

**Display:** 4-digit, 14-segment  
red 14.2 mm H (0.56") LED,  
10 mm (0.4") green  $^{\circ}\text{C}/^{\circ}\text{F}$  LED,  
option 10 mm (0.4") green

### Accuracy:

#### 1° Resolution:

**J, K, T, E:**  $\pm 1^{\circ}\text{C}/\text{F} + 0.03\%$  rdg

**R, S:**  $\pm 1^{\circ}\text{C}/\text{F} + 0.05\%$  rdg

**2-, 3-, 4-Wire RTD:**  
 $\pm 0.8^{\circ}\text{C}/\text{F} + 0.03\%$  rdg

#### 0.1° Resolution:

**J, K, T, E:**  $\pm 0.5^{\circ}\text{C}$  (0.9°F)  $\pm 1$  digit

**2-, 3-, 4-Wire RTD:**

$\pm 0.5^{\circ}\text{C}$  (0.9°F)  $\pm 1$  digit

**Process:** 0.02% rdg  $\pm 1$  count

### Multi-Input Option Accuracy:

Add  $\pm 0.5^{\circ}\text{C}$  (0.9°F) to instrument  
accuracy specification

**Repeatability:**  $\pm 1$  count

### Temperature Stability:

**Zero:** 1  $\mu\text{V}/^{\circ}\text{C}$

**Span:** 0.01%

### Thermocouple Reference Junction:

Internal, automatic,  $0.03^{\circ}\text{C}/^{\circ}\text{C}$ ,  
5 to  $45^{\circ}\text{C}$  (41 to  $113^{\circ}\text{F}$ )

**Break Detection:** Up-scale 50 nA,  
unit displays OL

### Environmental Ranges:

**Operating Temperature:**

0 to  $50^{\circ}\text{C}$  (32 to  $122^{\circ}\text{F}$ )

**Storage Temperature:**

-40 to  $65^{\circ}\text{C}$  (-40 to  $149^{\circ}\text{F}$ )

**Humidity:** <80% RH,  
non-condensing

**Stability with Time:**  $0.8^{\circ}$  per year

**Noise Rejection:** NMRR 60 dB @  
50/60 Hz, CMRR 120 dB @ 50/60 Hz  
( $\pm 0.1$  Hz with 250  $\Omega$  unbalanced)

### Overload Protection:

**Power Leads to Ground:**

1500 Vdc or Vac rms

**Across Inputs, for 1 Minute:**

Inputs up to 250 Vac/Vdc

### Input Impedance:

**Thermocouple:** 20 M $\Omega$ , exclusive of  
break detect current effects

**RTD:** 16.9 k $\Omega$

### Process:

**Voltage:** 1 M $\Omega$

**Current:** 5  $\Omega$

**Point Update Rate:** 2/s nominal

(1° readings); 1/s nominal (0.1° readings)

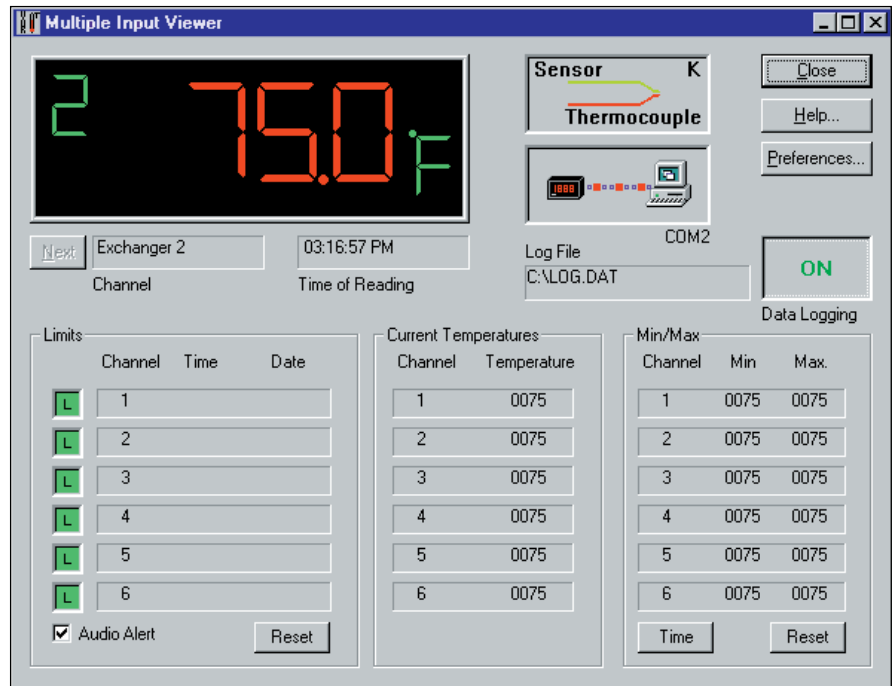
### Alarm Relay Contact Rating:

5 A @ 120 Vac SPDT

(non-inductive load) form "C"

### RS232 Serial Communications:

Full-duplex voltage, isolated from ground  
to 500 Vac; 9600 baud, 8 bits, 1 stop  
bit, no parity, ASCII, (no protocol is  
available).



Multiple-input viewer monitors channels, alarm conditions and data logging functions.

### Options/Accessories

**Dual Alarm Model:** Two 5 A/120V,  
form "C" relay outputs

**Analog Output Model:** 0 to 10 Vdc,  
fully scalable (load current 2 mA  
maximum); 4 to 20 mA DC, fully scalable  
(load resistance 300  $\Omega$  maximum)

**Analog Output Accuracy:**

0.25% FS of display value

**Analog Output Resolution:**

Approximately 0.0125 FS

**Analog Output Isolation:**

Isolated between input and  
internal circuit to 500 Vac

**Multiple-Input Option:** Up to

6 thermocouple/process inputs or three  
3- or 4-wire RTDs; auto/manual scanning;  
LED channel indicator, 10 mm (0.4")  
green; individually programmable  
setpoints on each input; 5 A/120V,  
form "C" relay (SPDT) output energized  
whenever limit exceeded on any channel

**Size:** 48 x 96 mm (1.89 x 3.78")

**Panel Cutout:** 1/8 DIN, 45 x 92 mm

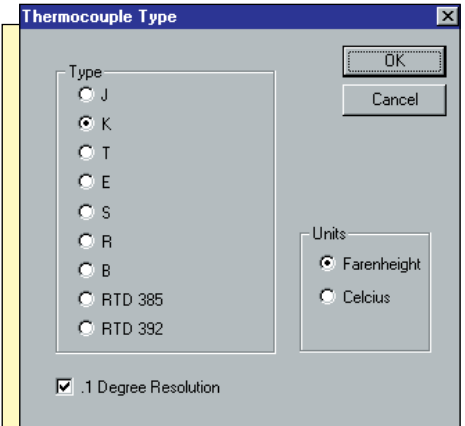
(1.8 x 3.6")

**Weight:** 454 g (1 lb)

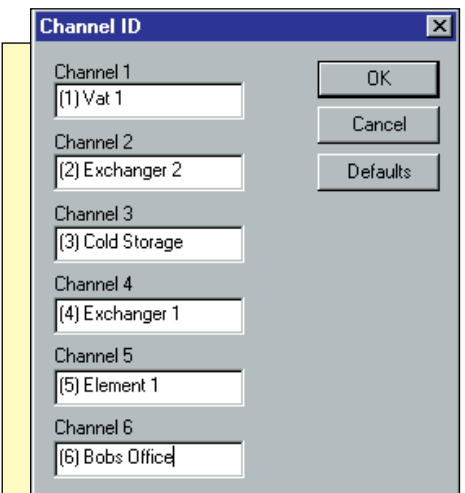


OMEGACARE<sup>SM</sup> extended  
warranty program is  
available for models  
shown on this page.

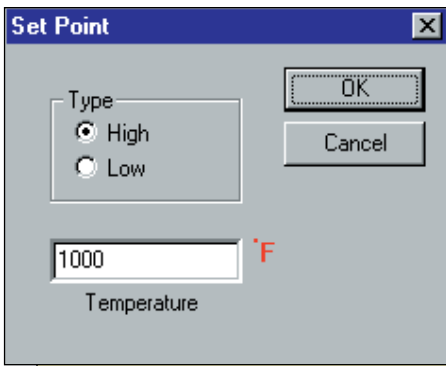
OMEGACARE<sup>SM</sup>  
covers parts, labor, and  
equivalent loaners.  
Ask your sales  
representative for full  
details when placing  
an order.



Simple way to select the input type,  
engineering units,  
and display resolution.



Each channel can be custom labeled.



Setpoint selection for the alarm.



Companion meter: The low-cost, 1/2 DIN, single-input DP450 Series is also available for process, voltage, current and frequency measurement.

DP472-T-C2, 6-channel, 1/2 DIN thermocouple input meter shown smaller than actual size.



| Input Type                    | 1° Resolution                      |                       | 0.1° Resolution                        |                       |
|-------------------------------|------------------------------------|-----------------------|--|-----------------------|
|                               | Range                              | Accuracy <sup>1</sup> | Range                                  | Accuracy <sup>1</sup> |
| Iron-Constantan <b>J</b>      | -205 to 762°C<br>(-337 to 1403°F)  | 0.03%                 | -99.9 to 761.8°C<br>(-99.9 to 999.9°F) | 0.5°C<br>(0.9°F)      |
| CHROMEQA®-ALOMEGA® <b>K</b>   | -202 to 1377°C<br>(-331 to 2510°F) | 0.03%                 | -99.9 to 999.9°C<br>(-99.9 to 999.9°F) | 0.5°C<br>(0.9°F)      |
| Copper-Constantan <b>T</b>    | -210 to 401°C<br>(-346 to 775°F)   | 0.03%                 | -99.9 to 401.4°C<br>(-99.9 to 754.6°F) | 0.5°C<br>(0.9°F)      |
| CHROMEQA® Constantan <b>E</b> | -205 to 1002°C<br>(-338 to 1835°F) | 0.03%                 | -99.9 to 999.9°C<br>(-99.9 to 999.9°F) | 0.5°C<br>(0.9°F)      |
| Pt-Pt13% Rh <b>R</b>          | 0 to 1769°C<br>(32 to 3216°F)      | 0.05%                 | Not available                          | —                     |
| Pt-Pt10% Rh <b>S</b>          | 0 to 1770°C<br>(32 to 3218°F)      | 0.05%                 | Not available                          | —                     |
| α = 0.00385 <b>RTD</b>        | -200 to 863°C<br>(-329 to 1585°F)  | 0.03%                 | -99.9 to 862.6°C<br>(-99.9 to 999.9°F) | 0.5°C<br>(0.9°F)      |
| α = 0.00392 <b>RTD</b>        | -202 to 851°C<br>(-332 to 1563°F)  | 0.03%                 | 99.9 to 850.8°C<br>(-99.9 to 999.9°F)  | 0.5°C<br>(0.9°F)      |
| Process                       | 0 to 20 mA, 0 to 10 Vdc            |                       | Scalable -999 to 9999**                |                       |

<sup>1</sup> Accuracy is % rdg + 1 digit.  
<sup>\*\*</sup> 0.02% ±1 count.

| To Order     |   |
|--------------|---|
| RS232 Models |   |
| Model No.    | Description                                   |
| DP470(*)-C2  | Single-input meter                            |
| DP471(*)-C2  | Single-input meter with dual alarms           |
| DP472(*)-C2  | 6-channel input scanner†                      |
| DP473(*)-C2  | Single-input meter with analog voltage output |
| DP474(*)-C2  | Single-input meter with analog current output |

\* Insert input code "T" for thermocouple, "V" for process input, "RTD" for RTD or "MA" for current input.  
 † For RTD models for an additional cost, 3-channel input only.  
 Comes complete with operator's manual, panel mount bracket and power/interface screw terminal connector.

**Power Options††**

| Order Suffix | Power        |
|--------------|--------------|
| -12VDC       | 8 to 15 Vdc  |
| -24VDC       | 20 to 28 Vdc |
| -24VAC       | 20 to 28 Vac |

†† Not field installable.

**Accessory**

| Model No.      | Description  |
|----------------|--|
| DP470-C2-CABLE | Configuration cable; includes RS232 cable and power cable pre-wired to a DP470 connector |

**Ordering Examples:** DP473-RTD-C2, RTD input panel meter with analog voltage output and RS232 communications, software configuration with each unit. OCV-3, OMEGACARE<sup>SM</sup> extends standard 2-year warranty to a total of 5 years, for additional cost. DP472-T-C2, thermocouple input, 6-channel input.