

1/8 DIN Ultra High Performance Meter

DP41-B



- ✓ Universal Inputs: DC Voltage/Current, T/C, RTD, and Strain
- ✓ Accuracy: $\pm 0.005\%$ Rdg
- ✓ 6-Digit Patented Color-Changing LED Display
- ✓ Up to 142 Readings Per Second
- ✓ 10-Point Linearization
- ✓ 4 Isolated Open-Collector Outputs
- ✓ Isolated Analog Output (Optional)
- ✓ 4 Relays (Optional)
- ✓ Optional Ethernet or RS232/RS485 Communications
- ✓ NEMA 4 (IP65) Front Bezel
- ✓ Ratiometric Mode for Strain Gages
- ✓ AC and DC Powered Units

OMEGA set the world standard for accuracy, performance and quality in digital panel meters. The DP41-B raises the bar even higher with accuracy of up to $\pm 0.005\%$ of reading, and up to 142 readings per second.



DP41-B, shown actual size.

The versatile DP41-B handles a broad spectrum of DC voltage and current ranges, nine thermocouple types, multiple RTD's, and signals from strain gauge transducers such as load cells and pressure transducers, as well as potentiometric inputs.

It also features ten point linearization of input signals, programmable by the user for custom applications.

Built-in excitation to power virtually any sensor or transmitter, and four isolated open collector outputs for control or alarms are standard.

The big, bright, 6 digit patented LED display can be programmed to change color between **RED**,

AMBER, and **GREEN** at any set point. The digits are 58% bigger than the typical display. Output options include: Isolated programmable analog voltage or current and four relays.

With the Serial Communications option, the user can select from a push-button menu between RS232, RS485, and either a straightforward ASCII protocol or MODBUS. With Omega's award-winning Ethernet/Internet option, the DP41-B connects directly to an Ethernet network and transmits data in standard TCP/IP protocol. It is possible to monitor and control a process through a web browser from anywhere on the Internet.

change color

At Any Setpoint



Totally Programmable Color Displays

The DP41-B meter has totally programmable color displays.

The display can be programmed to change color at any setpoint or alarm point.



Programmable Color Display

The DP41-B has totally programmable color displays. The display can be programmed to change color at any setpoint or alarm point.

For example, one could use **GREEN** during warm-up, switch to **AMBER** for the normal operating range, and choose **RED** to signal an alarm condition. The changes in color are visible from a distance, allowing the user to react to changing conditions. The colors can be programmed to change back when the value drops back below the alarm point or to “latch” on until being reset by the operator.

The instrument can also display only 1 unchanging color: **GREEN**, **AMBER**, or **RED**. This lets an operator identify process values in 3 separate locations or display 3 different measurements, such as temperature, pressure, and flow.

QUALITY and TECHNOLOGY

The innovative OMEGA® DP41-B meters are backed by a 5-year warranty. Using COB (chip-on-board) and SMT (surface mount technology) assembly techniques and automation, the DP41-B packs a wealth of power and features into a compact package. Every instrument is thoroughly calibrated and tested at several stages throughout production. The DP41-B has very high accuracy: 0.005% of reading. The analog-to-digital conversion uses patented algorithms and smart filtering.

Universal Inputs

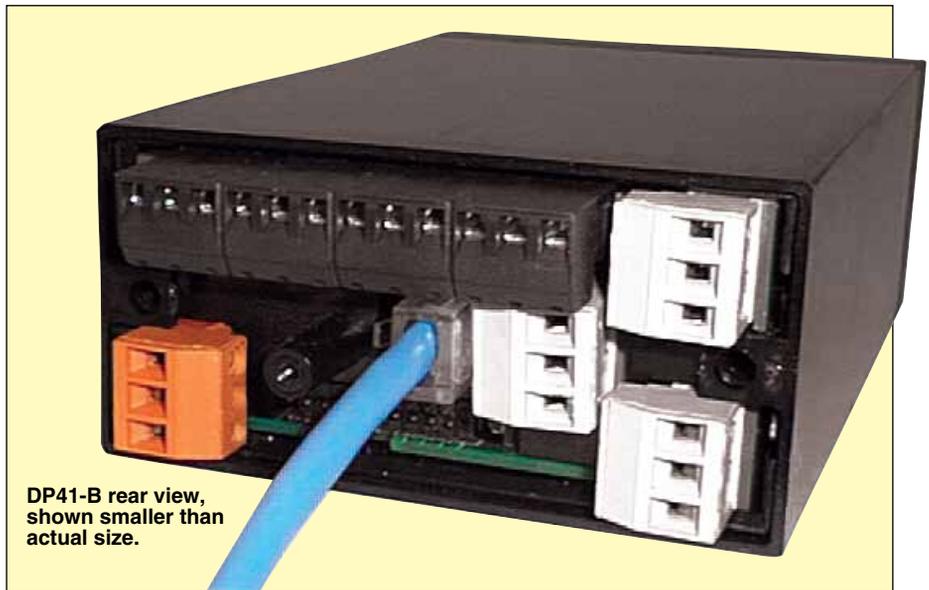
The DP41-B offers a broad selection of signal inputs, selectable from the front-panel pushbutton menu or by serial or Ethernet communications.

Nine Thermocouple Types

The DP41-B handles 9 thermocouple Types: K, J, T, E, R, S, B, N, and J DIN. The patented thermocouple linearization algorithms produce very high accuracy.

Most Accurate RTD Measurements

The DP41-B works with a wide selection of RTDs. It handles Pt 0.00385 and 0.00392 curves, any 6 to 6000 Ω NIST or DIN Pt, and any linear RTD (10 Ω Cu, etc.). A choice of 2-, 3-, or 4-wire RTD connections ensures high accuracy.



DP41-B rear view, shown smaller than actual size.

Process Voltage and Current

The OMEGA® DP41-B measures process voltage in ranges of 0 to 100 mV, 0 to 1V, 0 to 10V, 0 to 100V (unipolar), ±50 mV, ±500 mV, ±5 V, ±50 V (bipolar), and process current from 0 to 20 mA or 4 to 20 mA

Strain Gage

The DP41-B measures inputs from load cells, pressure transducers, and most strain gage sensors. Input can be linearized over 10 points on ranges 0 to 100 mV, 0 to 1V, 0 to 10V, 0 to 100V (unipolar), ±50 mV, ±500 mV, ±5V, and ±50V (bipolar), in addition to 0 to 20 mA. Excitation for transducers of 10 and 24V is standard.

Analog Output

The optional analog output covers a range of 0 to 10 Vdc or 0 to 20 mA, selectable as a calibrated retransmission of the process value.

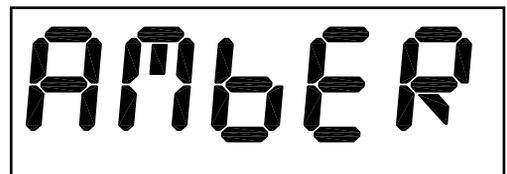
Built-In Excitation

The DP41-B features built-in excitation. The user can capture and display peak and valley levels of input signals, useful in such applications as destructive and pressure testing. Five different excitation levels are available for sensors such as transmitters (24 Vdc @ 25 mA), strain gages (1.5 to 10 Vdc @ up to 60 mA max), and slide-wire potentiometers (1.25 Vdc @ 30 mA).

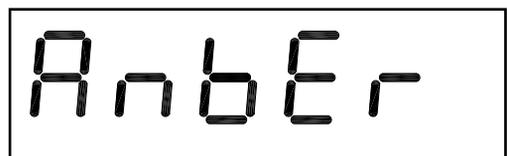
Free Software

The DP41-B with the “-C24” or “-EI” option are designed for easy integration with popular industrial automation and control programs as well as Microsoft Visual Basic and Excel. OMEGA provides free configuration software which makes it fast and easy to get up and running with many applications.

The DP41-B has a unique 9-segment LED display, which makes alphanumeric representations much clearer. The 7-segment LED characters found on most instruments are adequate for presenting numbers, but not letters. Words are easier to read with the unique 9-segment LED characters on the DP41-B, which makes operating and programming easier.



9-Segment Display (Bigger)



7-Segment Display (Smaller)

Factory Setup and Configuration

DP41-B meters/controllers can be preconfigured by the factory. The user specifies the input types, scaling if applicable, setpoints, alarm points, etc., and we will program the instruments in our calibration lab before shipment. For a checklist of factory setup parameters, please consult the OMEGA engineers.

Specifications

Accuracy: $\pm 0.005\%$ rdg

Span Temperature Coefficient: ± 20 ppm

Power: 90 to 240 Vac or 10 to 32 Vdc

Normal-Mode Rejection: 60 dB

Common-Mode Rejection: 120 dB

Common-Mode Voltage:

1500 Vp per Hv test

Resolution: 24-bit

Reading Rate:

7 to 142 samples per second

Display: Red/amber/green, 6-digit,

9-segment; 17.3 H x 10.2 mm W

(0.68 x 0.40"); 4 alarm indicators;

$^{\circ}\text{C}$, $^{\circ}\text{F}$, and K

Panel Cutout: 45 H x 92 mm W

(1.8 x 3.6"); $\frac{1}{8}$ DIN

Setpoint Outputs: 4, isolated open collector; rated 150 mA at 1V sink,

30V open

4-Relay Option: Two 5 A and two 3 A

relays; form "C", SPDT

Analog Output: 0 to 5V/1 to 5V/

0 to 10V/0 to 20 mA/4 to 20 mA,

user selectable; 354 Vp isolation;

14-bit resolution; 0.1% accuracy;

6 ms step response

Ethernet: Standards compliance IEEE 802.3 10 Base-T

Protocols: TCP/IP, ARP, HTTPGET

RS232/RS422/RS485/telnet simulation/

tunneling

MODBUS: Selectable from menu

Voltage Input Ranges: 0 to 100 mV,

0 to 1V, 0 to 10V, 0 to 100V, ± 50 mV,

± 500 mV, ± 5 V, ± 50 V

Current Input Ranges: 0 to 20 mA,

4 to 20 mA

Polarity: Unipolar/bipolar, programmable

Thermocouple Input Types:

J, K, T, E, R, S, B, N, J DIN

RTD Input: Any 6 Ω to 6 k Ω NIST or

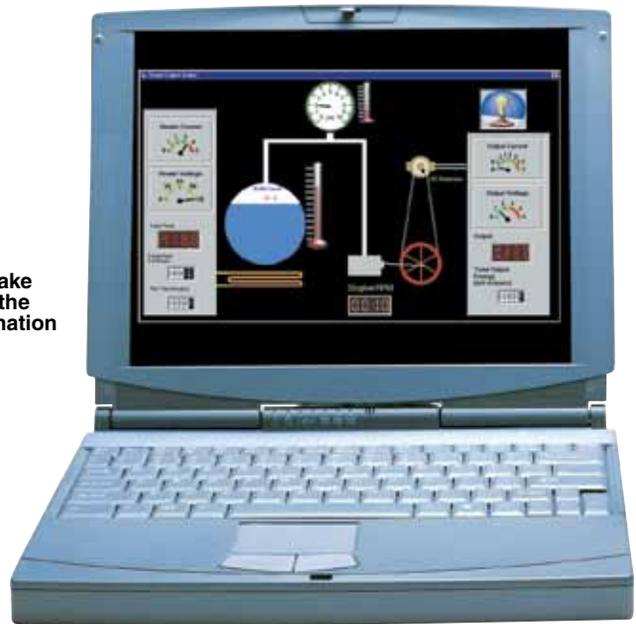
DIN platinum and any linear RTD

RTD Connection: 2-, 3- or 4-wire

Sensor Excitation: 10V at 30 mA;

24V at 25 mA

ActiveX controls make it easy to integrate the DP41-B with information systems.

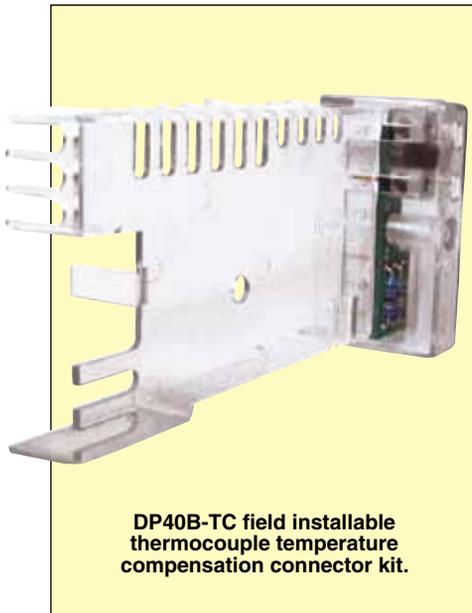
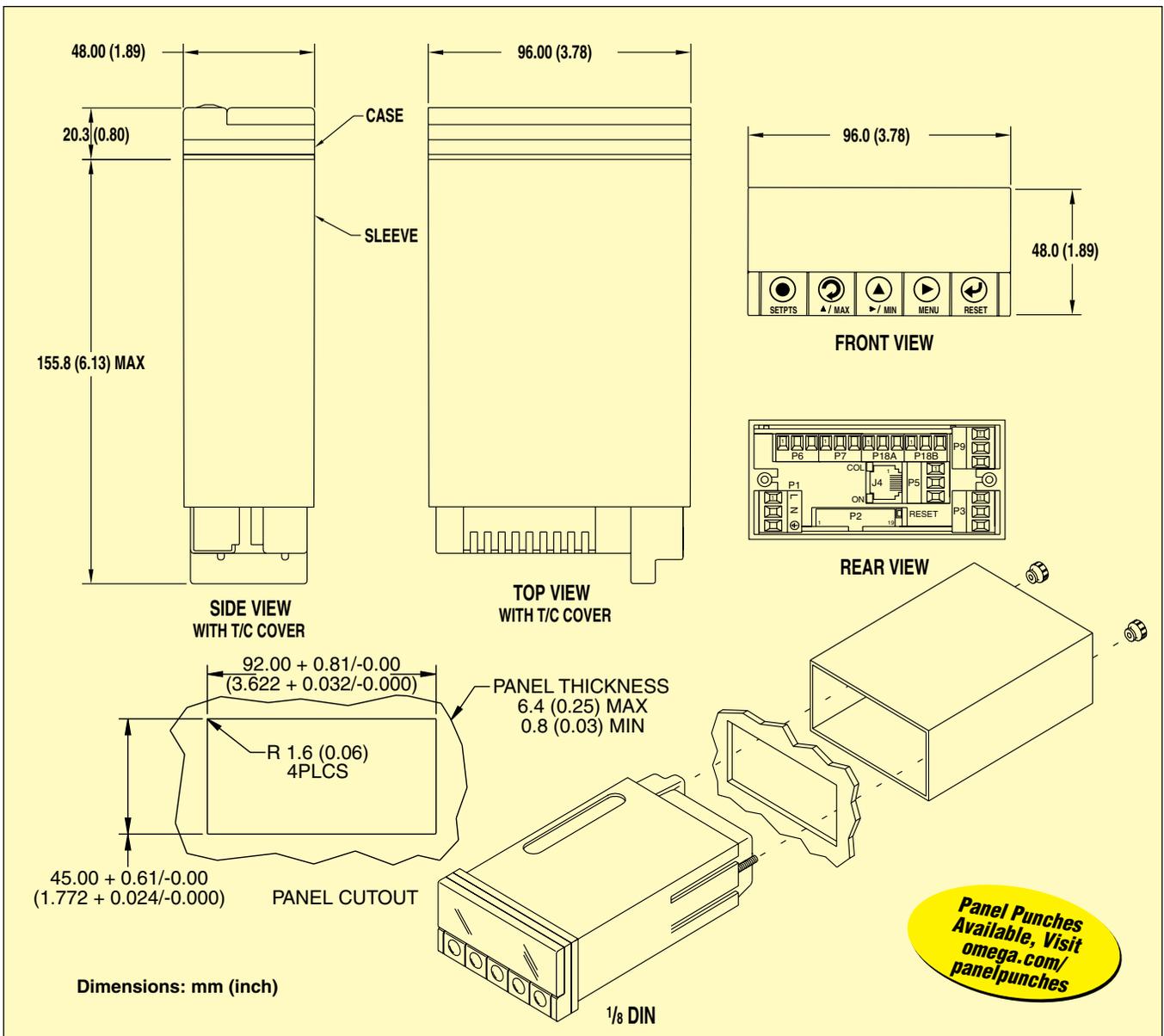


Input Types

Sensor Type	Range	Accuracy*
J Iron-Constantan	-210 to 760 $^{\circ}\text{C}$ -346 to 1400 $^{\circ}\text{F}$ 63.2 to 1673.2 K	0.2 $^{\circ}\text{C}$ 0.3 $^{\circ}\text{F}$ 0.2 K
K Chromel-Alumel	-250 to 1250 $^{\circ}\text{C}$ -418 to 2282 $^{\circ}\text{F}$ 23 to 977.2 K	0.2 $^{\circ}\text{C}$ 0.3 $^{\circ}\text{F}$ 0.2 K
T Copper-Constantan	-270 to 400 $^{\circ}\text{C}$ -454 to 752 $^{\circ}\text{F}$ 3.2 to 673.2 K	0.2 $^{\circ}\text{C}$ 0.3 $^{\circ}\text{F}$ 0.2 K
E Chromel-Constantan	-270 to 1000 $^{\circ}\text{C}$ -454 to 1832 $^{\circ}\text{F}$ 3.2 to 1273.2 K	0.2 $^{\circ}\text{C}$ 0.3 $^{\circ}\text{F}$ 0.2 K
R Pt/13%Rh-platinum	-50 to 1768 $^{\circ}\text{C}$ -58 to 3214 $^{\circ}\text{F}$ 223.2 to 2041.2 K	0.2 $^{\circ}\text{C}$ 0.3 $^{\circ}\text{F}$ 0.2 K
S Pt/10%Rh-platinum	-50 to 1768 $^{\circ}\text{C}$ -58 to 3214 $^{\circ}\text{F}$ 223.2 to 2041.2 K	0.2 $^{\circ}\text{C}$ 0.3 $^{\circ}\text{F}$ 0.2 K
B Pt/30%Rh-Pt/6%Rh	+100 to 1820 $^{\circ}\text{C}$ +212 to 3300 $^{\circ}\text{F}$ 373.2 to 2093.2 K	0.3 $^{\circ}\text{C}$ 0.5 $^{\circ}\text{F}$ 0.3 K
N OMEGALLOY*1 nicosil-nisil	-270 to 1300 $^{\circ}\text{C}$ -454 to 2372 $^{\circ}\text{F}$ 3.2 to 1573.2 K	0.2 $^{\circ}\text{C}$ 0.3 $^{\circ}\text{F}$ 0.2 K
J DIN Iron-Constantan	-200 to 900 $^{\circ}\text{C}$ -328 to 1652 $^{\circ}\text{F}$ 73.2 to 1173.2 K	0.6 $^{\circ}\text{C}$ 1.0 $^{\circ}\text{F}$ 0.6 K

Sensor Type	Range	Accuracy*
RTD 1 10 Ω Copper	-200 to 200 $^{\circ}\text{C}$ -328 to 392 $^{\circ}\text{F}$ 73.2 to 473.2 K	1.0 $^{\circ}\text{C}$ 2.0 $^{\circ}\text{F}$ 1.0 K
RTD 2 100 Ω Pt 0.00385	-200 to 900 $^{\circ}\text{C}$ -328 to 1652 $^{\circ}\text{F}$ 73.2 to 1173.2 K	0.2 $^{\circ}\text{C}$ 0.3 $^{\circ}\text{F}$ 0.2 K
RTD 3 100 Ω Pt 0.00392	-200 to 850 $^{\circ}\text{C}$ -328 to 1562 $^{\circ}\text{F}$ 73.2 to 1123.2 K	0.2 $^{\circ}\text{C}$ 0.3 $^{\circ}\text{F}$ 0.2 K

* Includes (all \pm) maximum linearization error.



To Order Visit omega.com/dp41b for Pricing and Details

Model No.	Description
DP41-B	Universal digital meter (suffix “-TC” required for thermocouple input)

Options and Accessory

Suffix	Description
-TC	Thermocouple Input
-4R	4-relay form “C” SPDT output board
-A	Isolated 14-bit analog output board
-C24	Serial communications, RS232 + RS485 + MODBUS*
-DC	Low voltage power option 10 to 32 Vdc
-EI	Ethernet/Internet*
DP40B-TC	Field installable thermocouple temperature compensation connector kit

Comes complete with operator's manual.

** Mutually exclusive; can order 1 communication/Ethernet option per unit.*

All output options are on printed circuit boards that can be installed at the factory or in the field.

Ordering Example: DP41-B-TC-4R-A, universal digital meter with optional thermocouple input module, 4-relay output board and analog output board.