⅛ DIN Temperature Panel Meter
With Optional USB Communications

DP6070 Series

MADE IN USA · 3 YEAR WARRANTY · CE · c UL · RoHS

DP6070 shown smaller than actual size.

- ✔ Modular USB, RS232, RS485 Serial Communication Options and Relays
- ✔ J, K, T, E, R, S, B, N, C Thermocouples
- ✔ 100 or 1000 Ω Platinum, 10 Ω Copper, 120 Ω Nickel RTDs
- ✔ 1 or 0.1° Resolution
- ✔ Automatic Cold Junction Compensation
- ✔ NEMA 4X (IP65) Front
- ✔ Universal 85 to 265 Vac or 12/24 Vdc Input Power
- ✔ Large Dual-Line 6-Character Display, 15 and 12 mm (0.60 and 0.46")
- ✔ Sunlight Readable Display Models
- ✔ 2 or 4 Relays Plus Isolated 4 to 20 mA Output Options
- ✔ External 4-Relay and Digital I/O Expansion Modules
- ✔ Free Software for Operation, Monitoring and Programming

The DP6070 temperature meter boasts specifications and functionality that clearly makes it one of the most advanced temperature meters available. It's dual-line 6-character display, function keys, and optional expansion modules are only a few of the special features available.

The DP6070 accepts many thermocouple types and RTDs and can be configured to have either a 1° or 0.1° display resolution

on any type of sensor input. The lower display makes configuration simpler. The display itself is quite configurable. There are many relay functions for up to 8 relays; including an Interlock Relay function. The 4 to 20 mA output can represent up to 12 different parameters/variables. This makes the DP6070 one of the most versatile meters on the market. Sunlight readable display models have an extraordinarily bright LED display. The upper display can be programmed to indicate current temperature, maximum or minimum temperature, alternating maximum/minimum temperatures, one of eight alarm set points, or MODBUS input. The lower display can also be configured to display engineering units, set points, user defined legends, or simply turned off. Input selection and configuration are conveniently set up via rear switches and front panel programming. Three levels of password protection help maintain the reliability of the programming.

General Specifications

Display: Both displays are 6 digits (-99999 to 999999), red LEDs with leading zero blanking
   Upper Display: 15 mm (0.60") high
   Lower Display: 12 mm (0.46") high
Display Intensity: 8 intensity levels
Display Update Rate: 5/second (200 ms)
Overrange: Display flashes 999999
Underrange: Display flashes -99999

Display Assignment: The upper and lower displays may be assigned to PV1, PV2, PCT (percent), max/min, alternate max and min, set points, units (lower display only), or MODBUS input
Front Panel: NEMA 4X (IP65)
Programming Methods: 4 front panel buttons, digital inputs, PC and software, MODBUS registers, or cloning using copy function
Noise Filter: Programmable from 2 to 199 (0 will disable filter)
Filter Bypass: Programmable from 0.1 to 99.9% of calibrated span
Recalibration: Calibrated at the factory. Recalibration is recommended at least every 12 months
Max/Min Display: Max (peak)/min (valley) readings reached by the process are stored until reset by the user or until power to the meter is cycled
Password: 3 programmable passwords restrict modification of programmed settings; Pass 1: Allows use of function keys and digital inputs; Pass 2: Allows use of function keys, digital inputs and editing set/reset points; Pass 3: Restricts all programming, function keys, and digital inputs
Non-Volatile Memory: All programmed settings are stored in non-volatile memory for a minimum of ten years if power is lost
Power Options: 85 to 265 Vac 50/60 Hz, 90 to 265 Vdc, 20 W maximum, or jumper selectable 12/24 Vdc ±10%, 15 W max
Fuse (External, Required): UL recognized, 5 A max, slow blow; up to 6 meters may share one 5 A fuse

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Isolated Transmitter Power Supply: 24 Vdc ±5% @ 200 mA maximum (standard), (12/24 Vdc powered models rated @ 100 mA maximum); 5 or 10 Vdc @ 50 mA maximum, selectable with internal jumper J4

Normal Mode Rejection: Greater than 60 dB at 50/60 Hz

Isolation: 4 kV input/output-to-power line; 500V input-to-output or output-to-P+ supply

Overvoltage Category: Installation overvoltage category II, local level with smaller transient overvoltages than installation overvoltage category III

Operating Temperature Range: -40 to 65°C (-40 to 149°F)

Storage Temperature Range: -40 to 85°C (-40 to 185°F)

Relative Humidity: 0 to 90% non-condensing

Connections: Removable screw terminal blocks accept 12 to 22 AWG wire, RJ45 for external relays, digital I/O, and serial communication adaptors

Enclosure: ⅛ DIN, high impact plastic, UL 94V-0, color: black

Mounting: ⅛ DIN panel cutout required: 92 x 45 mm (3.622 x 1.772"); two panel mounting bracket assemblies are provided

Tightening Torque: Screw terminal connectors: 5 lb-in (0.56 Nm)

Overall Dimensions: 119 W x 62 H x 143 mm D (4.68 x 2.45 x 5.64")

Weight: 269 g (9.5 oz)

Temperature Input

Input: Thermocouple J, K, T, E, R, S, B, N, C; RTD 100 Ω platinum (0.00385 and 0.00392 curves), 10 Ω copper, 120 Ω nickel, 1000 Ω platinum

Input Impedance: Greater than 100 kΩ

Offset Adjust: User programmable offset adjust ±50.0 degrees

Temperature Drift: ±2°C maximum from 0 to 65°C ambient temperature; ±4°C maximum from -20 to 0°C ambient temperature

Sensor Break: Display flashes "open", relays can be programmed to go "on", "off", or to "ignore" (detected as an upscale condition)

Averaging: Up to 10 RTDs connected in parallel can be averaged

Accuracy and Range: See table above

Relays

Rating: 2 or 4 SPDT (Form C) internal and/or 4 SPST (Form A) external; rated 3 A @ 30 Vdc and 125/250 Vac resistive load; 1/14 HP (≈ 50 W) @ 125/250 Vac for inductive loads such as contactors, solenoids, etc.

Noise Suppression: Recommended for each relay contact switching inductive loads

Deadband: 0 to 100% of span, user programmable

High or Low Alarm: User may program any alarm for high or low trip point; unused alarm LEDs and relays may be disabled (turned off)

Relay Operation: Automatic (non-latching), latching (requires manual acknowledge), sampling (based on time), pump alternation control (2 to 8 relays), off (disable unused relays and enable interlock feature, manual on/off control mode)

Time Delay: 0 to 999.9 seconds, on and off relay time delays; programmable and independent for each relay

Fail-Safe Operation: Programmable and independent for each relay

Note: Relay coil is energized in non-alarm condition. In case of power failure, relay will go to alarm state.

Auto Initialization: When power is applied to the meter, relays will reflect the state of the input to the meter

Serial Communications

Protocol: MODBUS RTU

Meter Address/Slave ID: 1 - 247

Baud Rate: 300 to 19,200 bps

Transmit Time Delay: Programmable between 0 and 199 ms

Data: 8 bit (1 start bit, 1 or 2 stop bits)

Parity: Even, odd, or none with 1 or 2 stop bits

Byte-to-Byte Timeout: 0.01 to 2.54 seconds

Turn Around Delay: Less than 2 ms (fixed)

Isolated 4 to 20 mA Transmitter Output

Output Source: Process variable (PV), max, min, set points 1 through 8, manual control setting, or MODBUS input

Scaling Range: 1.000 to 23.000 mA for any display range

Factory Calibration: 4.000 to 20.000 = 4 to 20 mA output

Analog Output Programming: 23.000 mA maximum for all parameters: overrange, underrange, max, min, and break

Accuracy: ± 0.1% of span ± 0.004 mA

Temperature Drift: 0.4 µA/°C maximum from 0 to 65°C ambient, 0.8 µA/°C maximum from -40 to 0°C ambient

Note: Analog output drift is separate from input drift.

Isolated Transmitter Power Supply: Terminals I+ & R: 24 Vdc ± 5% @ 40 mA maximum, may be used to power the 4 to 20 mA output or other devices

External Loop Power Supply: 35 Vdc maximum

Output Loop Resistance:
  24 Vdc Power Supply: 10Ω minimum, 700Ω maximum
  35 Vdc (External) Power Supply: 100 Ω minimum, 1200 Ω maximum

Digital I/O Expansion Module

Channels: 4 digital inputs and 4 digital outputs per module

System: Up to 2 modules for a total of 8 inputs and 8 outputs

Digital Input Logic:
  High: 3 to 5 Vdc
  Low: 0 to 1.25 Vdc

Digital Output Logic:
  High: 3.1 to 3.3 Vdc
  Low: 0 to 0.4 Vdc

Source Current: 10 mA maximum

Sink Current: 1.5 mA minimum

+5 V Terminal: To be used as pull-up for digital inputs only

4-Relay Expansion Module

Relays: 4 Form A (SPST) rated 3 A @ 30 Vdc and 125/250 Vac resistive load; 1/14 HP (≈ 50 W) @ 125/250 Vac for inductive loads

Type	Range °C (°F)	Accuracy
J	-129 to 1093 (-200 to 2000)	±1°C
K	-129 to 1316 (-200 to 2400)	±1°C
T	-129 to 400 (-200 to 752)	±1°C
E	-129 to 982 (-200 to 1800)	±1°C
R/S	-46 to 1649 (-50 to 3000)	±2°C
B	400 to 1816 (752 to 3300)	±2°C
N	-73 to 1260 (-100 to 2300)	±2°C
C	0 to 2260 (32 to 4100)	±2°C
10Ω Copper	-200 to 260 (-328 to 500)	±0.1°C
100Ω Pt	-200 to 850 (-328 to 1562)	±0.4°C
120Ω Nickel	-79 to 260 (-110 to 500)	±0.1°C
1000Ω Pt	-200 to 482 (-328 to 900)	±0.4°C

Meter Copy

The Copy feature is used to copy (or clone) all the settings from one DP6070 to other DP6070 meters in about 20 seconds! The Copy function is a standard feature on all meters. It does not require a communications adapter, only an optional cable assembly, model number DPA1200. See the ordering information for complete details

NEMA 4X Field Enclosures

Thermoplastic NEMA 4X enclosures are constructed for either indoor or outdoor use.

DP6070 with DPA2812 NEMA 4X field enclosure, shown smaller than actual size.

To Order *Visit omega.com/dp6070 for Pricing and Details*

Model No.	Description
Standard 85 to 265 Vac Models	
DP6070-6R0	Temperature panel meter
DP6070-6R2	Temperature panel meter with 2 relays
DP6070-6R3	Temperature panel meter with 4 to 20 mA output
DP6070-6R4	Temperature panel meter with 4 relays
DP6070-6R5	Temperature panel meter with 2 relays and 4 to 20 mA output
DP6070-6R7	Temperature panel meter with 4 relays and 4 to 20 mA output
Standard 12/24 Vdc Low Voltage Models	
DP6070-7R0	Temperature panel meter
DP6070-7R2	Temperature panel meter with 2 relays
DP6070-7R3	Temperature panel meter with 4 to 20 mA output
Sunlight Readable Models, 85 to 265 Vac	
DP6070-6H0	Temperature panel meter
DP6070-6H2	Temperature panel meter with 2 relays
DP6070-6H3	Temperature panel meter with 4 to 20 mA output
Sunlight Readable Models, 12/24 Vdc Low Voltage	
DP6070-7H0	Temperature panel meter
DP6070-7H2	Temperature panel meter with 2 relays
DP6070-7H3	Temperature panel meter with 4 to 20 mA output

Accessories

Model No.	Description
DPA1004	4-relay expansion module - field installable
DPA1044	4 digital inputs and 4 digital outputs module - field installable
DPA1232	RS232 serial adaptor - field installable
DPA1485	RS485 serial adaptor - field installable
DPA8008	USB serial adaptor - field installable
DPA7485-I	RS232 to RS422/485 isolated converter - field installable
DPA7485-N	RS232 to RS422/485 non-isolated converter - field installable
DPA8232-N	USB to RS232 non-isolated converter - field installable
DPA8485-I	USB to RS422/485 isolated converter - field installable
DPA8485-N	USB to RS422/485 isolated converter - field installable
DPA1002	DIN rail mounting kit for 2 expansion modules
DPA1200	Meter copy cable
DPA2811	Plastic NEMA 4X enclosure for one DP6070 temperature meter
DPA2812	Plastic NEMA 4X enclosure for two DP6070 temperature meters

*Comes complete with 2 side mounting brackets and operator's manual. Free **CN6000-SOFT** software download available at **omega.com/dp6070**
Ordering Example: DP6070-6R2, temperature panel meter with 2 relays, and **DPA8008,** USB serial adaptor. **OCW-2,** OMEGACARE^{SM} extends standard 3-year warranty to a total of 5 years.*

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