⅛ DIN Process Panel Meter
With Optional USB Communications

OMEGA™

DP6000 Series

1 YEAR WARRANTY

- **Modular USB, RS232, RS485 Serial Communication Options and Relays**
- **0 to 20 mA, 4 to 20 mA, 0 to 5V, 1 to 5V, and ±10V Inputs**
- **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**
- **Isolated 24 Vdc @ 200 mA Transmitter Power Supply Standard**
- **Programmable Displays and Function Keys**
- **32-Point, Square Root, or Exponential Linearization**
- **MODBUS® RTU Communication Protocol Standard**
- **Free Software for Operation, Monitoring and Programming**

DP6000 shown smaller than actual size.

The DP6000 Series meter boasts specifications and functionality that clearly make it one of the most advanced process meters available. Its dual-line 6-digit display (999,999), advanced signal input conditioning functions, function keys, MODBUS RTU serial communications, and optional expansion modules are only a few of the features found on the DP6000. Sunlight readable display models have an extraordinarily bright LED display. They are perfect for applications where the meter is in direct sunlight or in applications where visibility may be impaired by smoke, fog, dust, or distance. The upper display can be programmed to indicate PV, maximum (peak), minimum (valley), alternating maximum/minimum, 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. The user friendly dual-line display makes the DP6000 easy to set up and program. No jumpers to set for input selection. All setup and programming are done via the front panel. Three levels of password protection help maintain the reliability of the programming. The Copy feature is used to copy (or clone) all the settings from one DP6000 to other meters in about 20 seconds! The Copy function is a standard feature on all meters. It does not require a communications adaptor, only an optional cable assembly.

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 max, or jumper selectable 12/24 Vdc ±10%, 15 W max

Fuse (External, Required): 5 A max, slow blow; up to 6 meters may share one 5 A fuse

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

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

Isolation: 4 kV input/output-to-power line; 500 V 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, 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)

Process Input

Input: Field selectable: 0 to 20 mA, 4 to 20 mA, ±10 Vdc (0 to 5, 1 to 5, 0 to 10V), MODBUS PV (slave)

Accuracy: ±0.03% of calibrated span ±1 count, square root and programmable exponent accuracy range: 10 to 100% of calibrated span

Temperature Drift: 0.005% of calibrated span/°C max from 0 to 65°C ambient, 0.01% of calibrated span/°C max from -40 to 0°C ambient

Signal Input Conditioning Function: Linear, square root, programmable exponent, or round horizontal tank volume calculation

Multi-Point Linearization: 2 to 32 points for PV or PV1; 2 to 8 points for PV2 (dual-scale level feature)

Programmable Exponent: 1.0001 to 2.9999

Low-Flow Cutoff: 0 to 999999 (0 disables cutoff function)

Decimal Point: Up to 5 decimal places or none: d.ddddd, dd.dddd, ddd.ddd, dddd.dd, ddddd.d, or dddddd

Calibration Range:

4 to 20 mA: Minimum span; input 1 and Input 2: 0.15 mA

±10 V: Minimum span; input 1 and 2: 0.10 V

An Error message will appear if input 1 and input 2 signals are too close together

Input Impedance:

Voltage Ranges: Greater than 1 MΩ

Current Ranges: 50 to 100 Ω (depending on resettable fuse impedance)

Input Overload: Current input protected by resettable fuse, 30 Vdc max; fuse resets automatically after fault is removed

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: 10 Ω minimum, 700 Ω 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

Meter Copy

The Copy feature is used to copy (or clone) all the settings from one DP6000 to other DP6000 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.

DP6000 with DPA2812 NEMA 4X field enclosure, shown smaller than actual size.

To Order *Visit omega.com/dp6000 for Pricing and Details*

Model No.	Description
Standard 85 to 265 Vac Models	
DP6000-6R0	Process panel meter
DP6000-6R2	Process panel meter with 2 relays
DP6000-6R3	Process panel meter with 4 to 20 mA output
DP6000-6R4	Process panel meter with 4 relays
DP6000-6R5	Process panel meter with 2 relays and 4 to 20 mA output
DP6000-6R7	Process panel meter with 4 relays and 4 to 20 mA output
Standard 12/24 Vdc Low Voltage Models	
DP6000-7R0	Process panel meter
DP6000-7R2	Process panel meter with 2 relays
DP6000-7R3	Process panel meter with 4 to 20 mA output
Sunlight Readable Models, 85 to 265 Vac	
DP6000-6H0	Process panel meter
DP6000-6H2	Process panel meter with 2 relays
DP6000-6H3	Process panel meter with 4 to 20 mA output
Sunlight Readable Models, 12/24 Vdc Low Voltage	
DP6000-7H0	Process panel meter
DP6000-7H2	Process panel meter with 2 relays
DP6000-7H3	Process 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.

***Ordering Example: DP6000-6R2,** process panel meter with 2 relays, and **DPA8008,** USB serial adaptor.*