

## Model DM61 Digital Panel Meter



### APPLICATIONS

*Tank Level Monitoring & Control / Pump and Flow Control / Remote Pressure Indication*

### FEATURES:

- Large Two Line 6-Digit Display
- Field Selectable Inputs
- Dual Scale Display Feature – Single Input
- Programmable Display and Function Keys
- User-Defined Peak / Valley (Min. / Max.) Indication
- Alarm Status Indicator
- On-Board Digital Input
- 3 Tier Password Protection

The Ashcroft DM61 digital panel meter is ideal for fulfilling application requirements where monitoring and/or data-logging is necessary. Incorporating user-friendly functions, it allows for quick set-up and programming. Its dual-line indication offers a distinct benefit for level measurement and the large panel display supplies high accuracy and precision due to an internal 24-bit A/D converter. This model also offers Modbus communication and expansion modules, thereby making it one of the most advanced meters available.

### PRODUCT SPECIFICATIONS

*Note: Except where noted all specifications apply to operation at +25°C (+77°F).*

**Inputs:** Field selectable: 0-20, 4-20 mA,  $\pm 10$  Vdc (0-5, 1-5, 0-10 V), Modbus PV (slave)

**Display:** 2 lines of 6 Digits; display reads –99999 to 999999, red LEDs with leading 0 blanking

**Character Height:** upper line: 0.60" (15 mm) / lower line: 0.46" (12 mm)

**Intensity (Adjustable):** 8 settings

**Update Rate:** 200 msec

**Function Key Assignment:** Programmable upper and lower displays may be assigned to PV1, PV2, PCT (%), max/min, alternate max and min, setpoints, units (lower display only), and Modbus input.

**Accuracy:**  $\pm 0.03\%$  of calibrated span  $\pm 1$  count, square root & programmable exponent accuracy range: 10-100% of calibrated span

**Programming Methods:** Panel buttons, digital input, PC and DPM ProView software, Modbus registers, or cloning with Copy function.

**Noise filter:** Selectable from 2 to 199 (0 disables filter)

**Filter Bypass:** Selectable from 0.1 to 99.9% of calibrated span

**Max/Min (PV) Display:** Stored until reset or power cycled to the meter

**Password Protection:** 3-level programmable passwords for allowing / restricting user access.

LEVEL-I. Allows use of function keys and digital inputs.

LEVEL-II. Provide access to function keys, digital inputs and editing set/reset points.

LEVEL-III. Prohibits all programming, function keys and digital inputs.

**Non-Volatile Memory:** Programmed settings stored for 10 years (min.) in the event power is lost.

### ELECTRICAL SPECIFICATIONS

**Power Options:** 85-265 Vac 50/60 Hz, 90-265 Vdc 20 W max or jumper selectable 12/24 Vdc  $\pm 10\%$ , 15W (max.)

**Fuse:** Required external fuse: UL Recognized, 5 Amp (max.), slow blow; up to 6 meters may share one 5 Amp fuse

**Isolated Transmitter Power Supply:** Terminals P+ & mp; P-: 24 Vdc  $\pm 5\%$  @ 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.

### ENVIRONMENTAL SPECIFICATIONS

**Operating Temperature Range:**  $-40/65^{\circ}\text{C}$  ( $-40/149^{\circ}\text{F}$ )

**Storage Temperature Range:**  $-40$  to  $85^{\circ}\text{C}$  ( $-40/185^{\circ}\text{F}$ )

**Relative Humidity:** 0-90% R.H. non-condensing.

**Temperature Coefficients:** 0.005% of calibrated span/ $^{\circ}\text{C}$  max from  $0/65^{\circ}\text{C}$  ( $32/149^{\circ}\text{C}$ ) ambient, 0.01% of calibrated span/ $^{\circ}\text{C}$  max from  $-40/0^{\circ}\text{C}$  ( $-40/32^{\circ}\text{F}$ ) ambient

### PHYSICAL SPECIFICATIONS

**Front Panel:** NEMA 4X, IP65

**Enclosure:**  $\frac{1}{2}$  DIN, high impact plastic, UL 94V-0, color: black

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

**Mounting:** Panel (mounting brackets included)

**Weight:** 9.5 oz

**UL File Number:** UL & c-UL Listed. E160849; 508 Industrial Control Equipment

### PROCESS INPUT

**Math 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:** 0-999999 (0 disables cutoff function)

**Decimal Point:** 0 through 5 places

**Calibration Range:** 4-20 mA: minimum span input 1 & input 2: 0.15 mA.  $\pm 10$  V: minimum span input 1 & 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 M $\Omega$ . Current ranges: 50-100 $\Omega$  (depending on resettable fuse impedance)

# Model DM61 Digital Panel Meter

**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.

**Resistive load:** 3 Amp @ 30 Vdc and 125/250 Vac

**Inductive load:** 1/4 HP (approx. 50 watts) @ 125/250 Vac

**Deadband:** 0-100% Span, user-defined/field programmable

**High or Low Alarm:** Field selectable; user may program for high, low or disabling alarm function.

**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).

**Relay Reset:** User selectable via front panel buttons or digital inputs

1. Automatic reset only (non-latching), when input passes the reset point
2. Automatic + manual reset at any time (non-latching)
3. Manual reset only, at any time (latching)
4. Manual reset only after alarm condition has cleared (latching)

**Note:** Front panel button or digital input may be assigned to acknowledge relays programmed for manual reset

**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:** 300-19,200 bps

**Transmit Time Delay:** Programmable between 0-199 msec or transmitter always on for RS-422

**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:** 0.01-2.54 seconds

**Turn Around Delay:** Less than 2 msec (fixed)

**Note:** Refer to the DP61 Modbus Register Tables for details

**ISOLATED 4-20 mA TRANSMITTER OUTPUT**

**Output Source:** Process variable (PV), max/min, set points 1-8, manual control setting, or Modbus input

**Scaling Range:** 1.000 to 23.000 mA for any display range

**Calibration:** Factory calibrated: 4.000 to 20.000 = 4-20 mA output

**Analog Output Programming:** 23.000 mA (max.) for all parameters: over/under range, max/min & break

**Accuracy:** ±0.1% Span ±0.004 mA

**Temperature Drift:**

0.4 µA/°C (max.) from 0/65°C (32/149°F) ambient

0.8 µA/°C (max.) from -40/0°C (-40/32°F) ambient

**Note:** Analog output drift is separate from input drift.

**Isolated Transmitter Power Supply:** Terminals I+ & R: 24 Vdc ±10% @ 40 mA (max.) may be used to power the 4-20 mA output or other devices. Present on both AC & DC powered units.

**External Loop Power Supply:** 35 Vdc maximum

**Output Loop Resistance:**

Power Supply	Min.	Max.
24 Vdc	10Ω	700Ω
35 Vdc (external)	100Ω	1200Ω

**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; 1/4 HP (approx. 50 watts) @ 125/250 Vac for inductive loads

**HOW TO ORDER**

**DM61**

**MODEL**  
DM61-Single Output  
Digital Panel Meter

**A**

**OUTPUT OPTIONS**  
A- None  
B- 4-20mA Output  
C- 2 Relays  
D 2 Relays & 20mA Output  
E- 4 Relays  
F- 4 Relays & 20mA Output

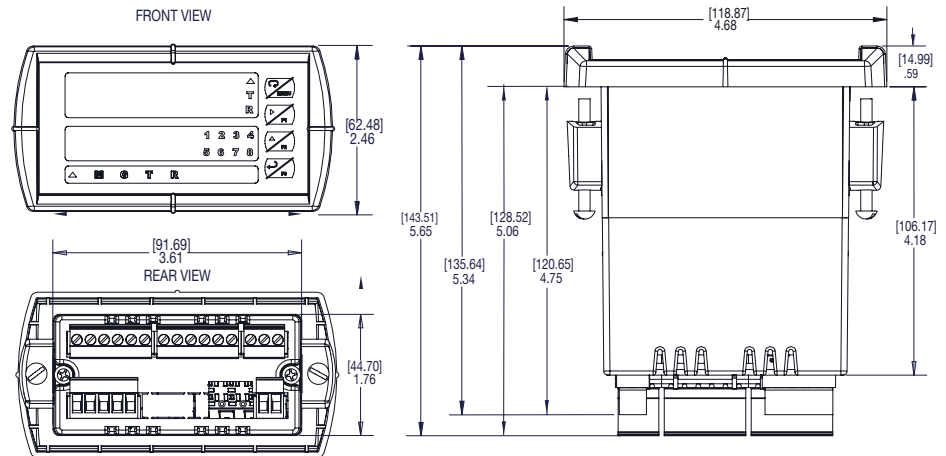
**DC**

**POWER SUPPLY**  
AC- 85-265 Vac  
DC- 12-24 Vdc

**Accessory Part#**

Part#	Description
101B224-01	Din Rail Mounting for Two Modules (pertains to 101B224-03, -04, -06, -07)
101B224-03	4 Relays Expansion Module
101B224-04	4 Digital Inputs & 4 Digital Outputs Module
101B224-05	Meter Copy Cable
101B224-08	DProM to USB Adapter (connects meter to PC & software)
101B224-06	RS-232 Serial Adapter
101B224-09	USB to RS-232 Non-Isolated Converter
101B224-07	RS-422/485 Serial Adapter
101B224-02	Suppressor (Snubber)

**DIMENSIONS [in inches]**



- NOTES:**
1. MOUNTING BRACKETS ARE REPRESENTATIVE ONLY, SIZE AND LOCATION MAY VARY BY INSTALLATION.
  2. INTERNAL ELECTRONICS AND MOUNTING GASKET NOT SHOWN.
  3. RECOMMENDED 1/6 DIN INSTALLATION CUTOUT SIZE OF 3.622" x 1.772" (92 mm x 45 mm) (W x H).
  4. PANEL THICKNESS 0.04"-0.25" (1.0 mm-6.4 mm).
  5. ALLOW AT LEAST 6" BEHIND PANEL FOR WIRING.
  6. RECOMMENDED MINIMUM PANEL THICKNESS TO MAINTAIN TYPE 4X:  
0.06" (1.5 mm) STEEL PANEL  
0.16" (4.1 mm) PLASTIC PANEL

- Notes:**
1. Panel cutout required: 1.772" x 3.622" (45mm x 92mm)
  2. Panel thickness: 0.040 - 0.250" (1.0mm - 6.4mm)
  3. Mounting brackets lock in place for easy mounting
  4. Clearance: Allow 6" (152 mm) behind the panel.