User’s Guide

Digital Panel Meters

DP63500-T
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DP63700-AC
DP63800-E
DP63900-S

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Digital Panel Meters

LP0677X
OMEGA Engineering, Inc. to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct, but OMEGA accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING : These products are not designed for use in, and should not be used for, human applications.
GENERAL DESCRIPTION

The DP63x00 Panel Meters offer many features and performance capabilities to suit a wide range of industrial applications. Available in five different models to handle various analog inputs, including DC Voltage/Current, AC Voltage/Current, Process, Temperature, and Strain Gage Inputs. Refer to pages 4 through 6 for the details on the specific models. The optional plug-in output cards allow the opportunity to configure the meter for present applications, while providing easy upgrades for future needs.

The meters employ a bright 0.56" LED display. The unit is available with a red sunlight readable or a standard green LED. The intensity of display can be adjusted from dark room applications up to sunlight readable, making it ideal for viewing in bright light applications.

The meters provide a MAX and MIN reading memory with programmable capture time. The capture time is used to prevent detection of false max or min readings which may occur during start-up or unusual process events.

The signal totalizer (integrator) can be used to compute a time-input product. This can be used to provide a readout of totalized flow, calculate service intervals of motors or pumps, etc. The totalizer can also accumulate batch weighing operations.

The meters have four setpoint outputs, implemented on Plug-in option cards. The Plug-in cards provide dual FORM-C relays (5A), quad FORM-A (3A), or either quad sinking or quad sourcing open collector logic outputs. The setpoint alarms can be configured to suit a variety of control and alarm requirements.

RS232 and RS485 Communication and Modbus Capabilities are also available as option cards. Readout values and setpoint alarm values can be controlled through the bus. Additionally, the meters have a feature that allows a remote computer to directly control the outputs of the meter. With an RS232 or RS485 card installed, it is possible to configure the meter using a Windows® based program. The configuration data can be saved to a file for later recall.

A linear DC output signal is available as an optional Plug-in card. The card provides either 20 mA or 10 V signals. The output can be scaled independent of the input range and can track either the input, totalizer, max or min readings.

Once the meters have been initially configured, the parameter list may be locked out from further modification in its entirety or only the setpoint values can be made accessible.

The meters have been specifically designed for harsh industrial environments. With NEMA 4X/IP65 sealed bezel and extensive testing of noise effects to CE requirements, the meter provides a tough yet reliable application solution.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in this literature or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use this unit to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the unit.

DIMENSIONS  In inches (mm)

Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 2.1" (53.4) H x 5.0" (127) W.
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**General Meter Specifications**

1. **DISPLAY**: 5 digit, 0.56" (14.2 mm) red sunlight readable or standard green LEDs, (-19999 to 99999)
2. **POWER**:  
   AC Versions:  
   - AC Power: 85 to 250 VAC, 50/60 Hz, 15 VA  
   - Isolation: 2300 Vrms for 1 min. to all inputs and outputs.  
   DC Versions (Not available on DP63700):  
   - DC Power: 11 to 36 VDC, 1.1 W  
     (derate operating temperature to 40° C if operating <15 VDC and three plug-in option cards are installed)  
   - AC Power: 24 VAC, ± 10%, 50/60 Hz, 15 VA  
   - Isolation: 500 Vrms for 1 min. to all inputs and outputs (50 V working).
3. **ANNUNCIATORS**:  
   - MAX - maximum readout selected  
   - MIN - minimum readout selected  
   - TOT - totalizer readout selected, flashes when total overflows  
   - SP1 - setpoint alarm 1 is active  
   - SP2 - setpoint alarm 2 is active  
   - SP3 - setpoint alarm 3 is active  
   - SP4 - setpoint alarm 4 is active  
   - Units Label - optional units label backlight
4. **KEYPAD**: 3 programmable function keys, 5 keys total
5. **A/D CONVERTER**: 16 bit resolution
6. **UPDATE RATES**:  
   - A/D conversion rate: 20 readings/sec.  
   - Step response: 200 msec. max. to within 99% of final readout value  
     (digital filter and internal zero correction disabled)  
   - 700 msec. max. (digital filter disabled, internal zero correction enabled)
7. **DISPLAY MESSAGES**:  
   - “OLUL” - Appears when measurement exceeds + signal range.  
   - “ULUL” - Appears when measurement exceeds - signal range.
8. **INPUT CAPABILITIES**: See specific product specifications, pages 4-6
9. **EXCITATION POWER**: See specific product specifications, pages 4-6
10. **LOW FREQUENCY NOISE REJECTION**: (Does not apply to DP63700)  
    - Normal Mode: > 60 dB @ 50 or 60 Hz ±1%, digital filter off  
    - Common Mode: > 100 dB, DC to 120 Hz
11. **USER INPUTS**: Three programmable user inputs  
    - Max. Continuous Input: 30 VDC  
    - Isolation To Sensor Input Common: Not isolated. (Not DP63700)  
    - DP63700: Isolation To Sensor Input Common: 1400 Vrms for 1 min.
    - Working Voltage: 125 V  
    - Response Time: 50 msec. max.

**Logic State**: Jumper selectable for sink/source logic

<table>
<thead>
<tr>
<th>INPUT STATE</th>
<th>SINKING INPUTS</th>
<th>SOURCING INPUTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>$V_{IN} &lt; 0.9$ VDC</td>
<td>$V_{IN} &gt; 3.6$ VDC</td>
</tr>
<tr>
<td>Inactive</td>
<td>$V_{IN} &gt; 0.9$ VDC</td>
<td>$V_{IN} &lt; 3.6$ VDC</td>
</tr>
</tbody>
</table>

12. **TOTALIZER**  
   - Function:  
     - Time Base: second, minute, hour, or day  
     - Batch: Can accumulate (gate) input display from a user input  
     - Time Accuracy: 0.01% typical  
     - Decimal Point: 0 to 0.0000  
     - Scale Factor: 0.001 to 65.000  
     - Low Signal Cut-out: -19,999 to 99,999  
     - Total: 9 digits, display alternates between high order and low order readouts
13. **CUSTOM LINEARIZATION**  
   - Data Point Pairs: Selectable from 2 to 16  
   - Time Base: second, minute, hour, or day  
   - Batch: Can accumulate (gate) input display from a user input  
   - Time Accuracy: 0.01% typical  
   - Decimal Point: 0 to 0.0000  
   - Scale Factor: 0.001 to 65.000  
   - Low Signal Cut-out: -19,999 to 99,999  
   - Total: 9 digits, display alternates between high order and low order readouts
14. **MEMORY**  
   - Nonvolatile E2PROM retains all programmable parameters and display values.
15. **ENVIRONMENTAL CONDITIONS**  
   - Operating Temperature Range: 0 to 50°C (0 to 45°C with all three plug-in cards installed)  
   - Vibration According to IEC 68-2-6: 5 to 150 Hz, in X, Y, Z direction for 1.5 hours, 2g’s.  
   - Shock According to IEC 68-2-27: Operational 25 g (10g relay), 11 msec in 3 directions.  
   - Storage Temperature Range: -40 to 60°C  
   - Operating and Storage Humidity: 0 to 85% max. RH non-condensing  
   - Altitude: Up to 2000 meters
16. **CERTIFICATIONS AND COMPLIANCES**  
   **SAFETY**  
   - UL Recognized Component, File #E313607, UL61010A-1, CSA C22.2 No. 1010-1  
   - DP63500 Only: File # E123489, UL873, CSA C22.2 No. 24  
   - Recognized to U.S. and Canadian requirements under the Component Recognition Program of Underwriters Laboratories, Inc.  
   - UL Listed, File # E313547, UL508, CSA C22.2 No. 14-M95  
   - LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards  
   - Type 4X Enclosure rating (Face only), UL50  
   - Type 10 Enclosure rating (Face only), IEC 529  
   - IP23 Enclosure rating (Rear of unit), IEC 529  
   - IP65 Enclosure rating (Face only), IEC 529  
   - IP20 Enclosure rating (Rear of unit), IEC 529  
   - UL Listed, File # E313547, UL508, CSA C22.2 No. 14-M95  
   - LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards
**ELECTROMAGNETIC COMPATIBILITY**

Notes:

1. Self-recoverable loss of performance during EMI disturbance at 10 V/m:
   Measurement input and/or analog output signal may deviate during EMI disturbance.

For operation without loss of performance:
- Unit is mounted in a metal enclosure (Buckeye SM7013-0 or equivalent)
- I/O and power cables are routed in metal conduit connected to earth ground.

Refer to EMC Installation Guidelines section of the bulletin for additional information.

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**CONNECTIONS**

- High compression cage-clamp terminal block
- Wire Strip Length: 0.3” (7.5 mm)
- Wire Gage: 30-14 AWG copper wire
- Torque: 4.5 inch-lbs (0.51 N-m) max.

**CONSTRUCTION**

- This unit is rated for NEMA 4X/IP65 outdoor use.

**WEIGHT**

- 10.4 oz. (295 g)

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**Model DP63600 - Universal DC Input**

- **FOUR VOLTAGE RANGES** (300 VDC Max)
- **FIVE CURRENT RANGES** (2A DC Max)
- **THREE RESISTANCE RANGES** (10K Ohm Max)
- **SELECTABLE 24 V, 2 V, 1.75 mA EXCITATION**

---

**DP63600 SPECIFICATIONS**

**INPUT RANGES:**

<table>
<thead>
<tr>
<th>INPUT RANGE</th>
<th>ACCURACY** (18 to 28°C)</th>
<th>ACCURACY** (0 to 50°C)</th>
<th>IMPEDANCE/COMPLIANCE</th>
<th>MAX CONTINUOUS OVERLOAD</th>
<th>RESOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>±200 μADC</td>
<td>0.03% of reading +0.03 μA</td>
<td>0.12% of reading +0.04 μA</td>
<td>1.11 Kohm</td>
<td>15 mA</td>
<td>0.1 nA</td>
</tr>
<tr>
<td>±2 mADC</td>
<td>0.03% of reading +0.3 μA</td>
<td>0.12% of reading +0.4 μA</td>
<td>111 ohm</td>
<td>50 mA</td>
<td>0.1 μA</td>
</tr>
<tr>
<td>±20 mADC</td>
<td>0.03% of reading +3 μA</td>
<td>0.12% of reading +4 μA</td>
<td>11.1 ohm</td>
<td>150 mA</td>
<td>1 μA</td>
</tr>
<tr>
<td>±200 mADC</td>
<td>0.05% of reading +30 μA</td>
<td>0.15% of reading +40 μA</td>
<td>1.1 ohm</td>
<td>500 mA</td>
<td>10 μA</td>
</tr>
<tr>
<td>±2 ADC</td>
<td>0.5% of reading +0.3 mA</td>
<td>0.7% of reading +0.4 mA</td>
<td>0.1 ohm</td>
<td>3 A</td>
<td>0.1 mA</td>
</tr>
<tr>
<td>±200 mVDC</td>
<td>0.03% of reading +30 μV</td>
<td>0.12% of reading +40 μV</td>
<td>1.066 Mohm</td>
<td>100 V</td>
<td>10 μV</td>
</tr>
<tr>
<td>±2 VDC</td>
<td>0.03% of reading +0.3 mV</td>
<td>0.12% of reading +0.4 mV</td>
<td>1.066 Mohm</td>
<td>300 V</td>
<td>0.1 mV</td>
</tr>
<tr>
<td>±20 VDC</td>
<td>0.03% of reading +3 mV</td>
<td>0.12% of reading +4 mV</td>
<td>1.066 Mohm</td>
<td>300 V</td>
<td>1 mV</td>
</tr>
<tr>
<td>±300 VDC</td>
<td>0.05% of reading +30 mV</td>
<td>0.15% of reading +40 mV</td>
<td>1.066 Mohm</td>
<td>300 V</td>
<td>10 mV</td>
</tr>
<tr>
<td>100 ohm</td>
<td>0.05% of reading +30 Mohm</td>
<td>0.2% of reading +40 Mohm</td>
<td>0.175 V</td>
<td>30 V</td>
<td>0.01 ohm</td>
</tr>
<tr>
<td>1000 ohm</td>
<td>0.05% of reading +0.3 ohm</td>
<td>0.2% of reading +0.4 ohm</td>
<td>1.75 V</td>
<td>30 V</td>
<td>0.1 ohm</td>
</tr>
<tr>
<td>10 Kohm</td>
<td>0.05% of reading +1 ohm</td>
<td>0.2% of reading +1.5 ohm</td>
<td>17.5 V</td>
<td>30 V</td>
<td>1 ohm</td>
</tr>
</tbody>
</table>

* After 20 minute warm-up. Accuracy is specified in two ways: Accuracy over an 18 to 28°C and 10 to 75% RH environment; and accuracy over a 0 to 50°C and 0 to 85% RH (non-condensing environment). Accuracy over the 0 to 50°C range includes the temperature coefficient effect of the meter.

**EXCITATION POWER**

- Transmitter Power: 24 VDC, ±5%, regulated, 50 mA max.
- Reference Voltage: 2 VDC, ±2%
- Compliance: 1 kohm load min. (2 mA max.)
- Temperature coefficient: 40 ppm/°C max.
- Reference Current: 1.75 mADC, ±2%
- Compliance: 10 kohm load max.
- Temperature coefficient: 40 ppm/°C max.
MODEL DP63700 - AC TRUE RMS VOLT AND CURRENT

DP63700 SPECIFICATIONS

- FOUR VOLTAGE RANGES (300 VAC Max)
- FIVE CURRENT RANGES (5 A Max)
- ACCEPTS AC OR DC COUPLED INPUTS
- THREE WAY ISOLATION: POWER, INPUT AND OUTPUTS

INPUT RANGES:

<table>
<thead>
<tr>
<th>Input Range</th>
<th>Accuracy* (18 to 28°C)</th>
<th>Impedance (60 Hz)</th>
<th>Max Continuous Overload</th>
<th>Max DC Blocking</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 µA</td>
<td>0.1% of reading +0.4 µA</td>
<td>1.11 Kohm</td>
<td>15 mA</td>
<td>±15 mA</td>
<td>0.01 µA</td>
</tr>
<tr>
<td>2 mA</td>
<td>0.1% of reading +2 µA</td>
<td>111 ohm</td>
<td>50 mA</td>
<td>±50 mA</td>
<td>0.1 µA</td>
</tr>
<tr>
<td>20 mA</td>
<td>0.1% of reading +20 µA</td>
<td>11.1 ohm</td>
<td>150 mA</td>
<td>±150 mA</td>
<td>1 µA</td>
</tr>
<tr>
<td>200 mA</td>
<td>0.1% of reading +0.2 mA</td>
<td>1.1 ohm</td>
<td>500 mA</td>
<td>±500 mA</td>
<td>10 µA</td>
</tr>
<tr>
<td>5 A</td>
<td>0.5% of reading +5 mA</td>
<td>0.02 ohm</td>
<td>7 A**</td>
<td>±7 A***</td>
<td>1 mA</td>
</tr>
</tbody>
</table>

*Conditions for accuracy specification:
- 20 minutes warm-up
- 18-28°C temperature range, 10-75% RH non-condensing
- 50 Hz - 400 Hz sine wave input
- 1% to 100% of range
- Add 0.1% reading + 20 counts error over 0-50°C range
- Add 0.2% reading + 10 counts error for crest factors up to 3, add 1% reading up to 5
- Add 0.5% reading + 10 counts of DC component
- Add 1% reading + 20 counts error over 20 Hz to 10 KHz range

** Non-repetitive surge rating: 15 A for 5 seconds

*** Inputs are direct coupled to the input divider and shunts. Input signals with high DC component levels may reduce the usable range.

MAX CREST FACTOR (Vp/VRMS): 5 @ Full Scale Input
INPUT COUPLING: AC or AC and DC
INPUT CAPACITANCE: 10 pF
COMMON MODE VOLTAGE: 125 VAC working
COMMON MODE REJECTION: (DC to 60 Hz) 100 dB
Model DP63500 - Thermocouple and RTD Input

**DP63500 Specifications**

**Sensor Inputs:**

<table>
<thead>
<tr>
<th>Input Range</th>
<th>Accuracy* (18 to 28°C)</th>
<th>Accuracy* (0 to 50°C)</th>
<th>Impedance</th>
<th>Max. Continuous Overload</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>±24 mVDC</td>
<td>0.02% of reading +3 μV</td>
<td>0.07% of reading +4 μV</td>
<td>100 Mohm</td>
<td>30 V</td>
<td>1 μV</td>
</tr>
<tr>
<td>±240 mVDC</td>
<td>0.02% of reading +30 μV</td>
<td>0.07% of reading +40 μV</td>
<td>100 Mohm</td>
<td>30 V</td>
<td>10 μV</td>
</tr>
</tbody>
</table>

*After 20 minute warm-up. Accuracy is specified in two ways: Accuracy over an 18 to 28°C and 10 to 75% RH environment; and accuracy over a 0 to 50°C and 0 to 85% RH (non-condensing environment). Accuracy over the 0 to 50°C range includes the temperature coefficient effect of the meter.

**Model DP63900 - Strain Gage Input**

- **Load Cell, Pressure and Torque Bridge Inputs**
- **Dual Range Input:** ±24 mV or ±240 mV
- **Selectable 5 VDC or 10 VDC Bridge Excitation**
- **Programmable Auto-Zero Tracking**

**Connection Type:** 4-wire bridge (differential)
2-wire (single-ended)

**Common Mode Range (w.r.t. input common):** 0 to +5 VDC

**Bridge Excitation:**
- Jumper Selectable: 5 VDC @ 65 mA max., ±2%
- 10 VDC @ 125 mA max., ±2%

Temperature coefficient (ratio metric): 20 ppm/°C max.

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**Model DP63900 - Thermocouple and RTD Input**

**DP63900 Specifications**

**Readout:**
- Resolution: Variable: 0.1, 0.2, 0.5, or 1, 2, or 5 degrees
- Scale: F or C
- Offset Range: -19,999 to 99,999 display units

**Thermocouple Inputs:**
- Input Impedance: 20 MΩ
- Lead Resistance Effect: 0.03μV/ohm
- Max. Continuous Overvoltage: 30 V

<table>
<thead>
<tr>
<th>Input Type</th>
<th>Range</th>
<th>Accuracy* (18 to 28°C)</th>
<th>Accuracy* (0 to 50°C)</th>
<th>Standard</th>
<th>Wire Color</th>
<th>ANSI</th>
<th>BS 1843</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>-200 to 400°C</td>
<td>1.2°C **</td>
<td>2.1°C **</td>
<td>ITS-90</td>
<td>(+) blue</td>
<td>(+) white</td>
<td>(+) blue</td>
</tr>
<tr>
<td>E</td>
<td>-200 to 871°C</td>
<td>1.0°C **</td>
<td>2.4°C **</td>
<td>ITS-90</td>
<td>(+) purple</td>
<td>(+) brown</td>
<td>(+) blue</td>
</tr>
<tr>
<td>J</td>
<td>-200 to 760°C</td>
<td>1.1°C **</td>
<td>2.3°C **</td>
<td>ITS-90</td>
<td>(+) white</td>
<td>(+) yellow</td>
<td>(+) blue</td>
</tr>
<tr>
<td>K</td>
<td>-200 to 1372°C</td>
<td>1.3°C **</td>
<td>3.4°C **</td>
<td>ITS-90</td>
<td>(+) yellow</td>
<td>(+) brown</td>
<td>(+) blue</td>
</tr>
<tr>
<td>R</td>
<td>-50 to 1768°C</td>
<td>1.9°C **</td>
<td>4.0°C **</td>
<td>ITS-90</td>
<td>no standard</td>
<td>(+) white</td>
<td>(+) blue</td>
</tr>
<tr>
<td>S</td>
<td>-50 to 1768°C</td>
<td>1.9°C **</td>
<td>4.0°C **</td>
<td>ITS-90</td>
<td>no standard</td>
<td>(+) white</td>
<td>(+) blue</td>
</tr>
<tr>
<td>B</td>
<td>100 to 300°C</td>
<td>3.9°C **</td>
<td>5.7°C **</td>
<td>ITS-90</td>
<td>no standard</td>
<td>no standard</td>
<td>no standard</td>
</tr>
<tr>
<td>N</td>
<td>-200 to 1300°C</td>
<td>1.3°C **</td>
<td>3.1°C **</td>
<td>ITS-90</td>
<td>(+) orange</td>
<td>(+) orange</td>
<td>(+) blue</td>
</tr>
<tr>
<td>C</td>
<td>0 to 2315°C</td>
<td>1.9°C **</td>
<td>6.1°C **</td>
<td>E988-90**</td>
<td>no standard</td>
<td>no standard</td>
<td>no standard</td>
</tr>
</tbody>
</table>

**RTD Inputs:**
- Type: 3 or 4 wire, 2 wire can be compensated for lead wire resistance
- Excitation current: 100 ohm range: 165 μA
- 10 ohm range: 2.6 mA
- Lead resistance: 100 ohm range: 10 ohm/lead max.
- 10 ohm range: 3 ohms/lead max.
- Max. continuous overload: 30 V

**Custom Range:** Up to 16 data point pairs
- Input range: -10 to 65 mV
- 0 to 400 ohms, high range
- 0 to 25 ohms, low range

---

*After 20 min. warm-up. Accuracy is specified in two ways: Accuracy over an 18 to 28°C and 15 to 75% RH environment; and accuracy over a 0 to 50°C and 0 to 85% RH (non-condensing environment). Accuracy specified over the 0 to 50°C operating range includes meter tempco and ice point tracking effects. The specification includes the A/D conversion errors, linearization conformity, and thermocouple ice point compensation. Total system accuracy is the sum of meter and probe errors. Accuracy may be improved by field calibrating the meter readout at the temperature of interest.

**The accuracy over the interval -270 to -200°C is a function of temperature, ranging from 1°C at -200°C and degrading to 7°C at -270°C. Accuracy may be improved by field calibrating the meter readout at the temperature of interest.**

*** These curves have been corrected to ITS-90.
**ACCESSORIES**

**UNITS LABEL KIT - Not required for DP63500**
Each meter has a units indicator with backlighting that can be customized using the Units Label Kit. The backlight is controlled in the programming. Each DP63500 meter is shipped with °F and °C overlay labels which can be installed into the meter’s bezel display assembly.

**PROGRAMMING SOFTWARE**
DP6-SOFT is a Windows® based program that allows configuration of the DP63x00 meters from a PC. The software offers standard drop-down menu commands, that make it easy to program the meter. The DP63x00 program can then be saved in a PC file for future use. A serial plug-in card is required to program the meter using the software.

**OCTINAL PLUG-IN OUTPUT CARDS**

**WARNING:** Disconnect all power to the unit before installing Plug-in cards.

**Adding Option Cards**
The DP63x00 and LDP63x00 series meters can be fitted with up to three optional plug-in cards. The details for each plug-in card can be reviewed in the specification section below. Only one card from each function type can be installed at one time. The function types include Setpoint Alarms (LDP6-CDL), Communications (LDP6-CDC), and Analog Output (LDP6-CDL). The plug-in cards can be installed initially or at a later date.

**DP63700 Isolation Specifications For All Option Cards**
**Isolation To Sensor Commons:** 1400 Vrms for 1 min.
- **Working Voltage:** 125 V
- **Isolation To User Input Commons:** 500 Vrms for 1 min.
- **Working Voltage:** 50 V

**COMMUNICATION CARDS (LDP6-CDC)**
A variety of communication protocols are available for the DP63x00 and LDP63x00 series. Only one of these cards can be installed at a time. When programming the unit via RLCPro, a Windows® based program, the RS232 or RS485 Cards must be used.

- **LDP6-CDC10** - RS485 Serial
- **LDP6-CDC20** - RS232 Serial

**SERIAL COMMUNICATIONS CARD**
- **Type:** RS485 or RS232
- **Isolation To Sensor & User Input Commons:** 500 Vrms for 1 min.
- **Working Voltage:** 50 V. Not Isolated from all other commons.
- **Data:** 7/8 bits
- **Baud:** 300 to 19,200
- **Parity:** no, odd or even
- **Bus Address:** Selectable 0 to 99, Max. 32 meters per line (RS485)
- **Transmit Delay:** Selectable for 2 to 50 msec or 50 to 100 msec (RS485)

**MODBUS CARD**
- **Type:** RS485; RTU and ASCII MODBUS modes
- **Isolation To Sensor & User Input Commons:** 500 Vrms for 1 minute.
- **Working Voltage:** 50 V. Not Isolated from all other commons.
- **Baud Rates:** 300 to 38400.
- **Data:** 7/8 bits
- **Parity:** No, Odd, or Even
- **Addresses:** 1 to 247.
- **Transmit Delay:** Programmable; See Transmit Delay explanation.

**LINEAR DC OUTPUT (LDP6-CDL)**
Either a 0(4)-20 mA or 0-10 V retransmitted linear DC output is available from the analog output plug-in card. The programmable output low and high scaling can be based on various display values. Reverse slope output is possible by reversing the scaling point positions.

- **LDP6-CDL10** - Retransmitted Analog Output Card

**ANALOG OUTPUT CARD**
- **Types:** 0 to 20 mA, 4 to 20 mA or 0 to 10 VDC
- **Isolation To Sensor & User Input Commons:** 500 Vrms for 1 min.
- **Working Voltage:** 50 V. Not Isolated from all other commons.
- **Accuracy:** 0.17% of FS (18 to 28°C), 0.4% of FS (0 to 50°C)

**Resolution:** 1/3500
**Compliance:** 10 VDC; 10 KΩ load min., 20 mA; 500 Ω load max.
**Update time:** 200 msec. max. to within 99% of final output value (digital filter and internal zero correction disabled)
- 700 msec. max. (digital filter disabled; internal zero correction enabled)

**SETPOINT CARDS (LDP6-CDL)**
The DP63x00 and LDP63x00 series has 4 available setpoint alarm output plug-in cards. Only one of these cards can be installed at a time. (Logic state of the outputs can be reversed in the programming.) These plug-in cards include:

- **LDP6-CDS40** - Isolated quad sourcing PNP open collector
- **LDP6-CDS30** - Isolated quad sinking NPN open collector
- **LDP6-CDS20** - Quad Relay, FORM-A, Normally open only
- **LDP6-CDS10** - Dual Relay, FORM-C, Normally open & closed

**DUAL RELAY CARD**
- **Type:** Two FORM-C relays
- **Isolation To Sensor & User Input Commons:** 2000 Vrms for 1 min.
- **Working Voltage:** 240 Vrms

**Contact Rating:**
- One Relay Energized: 5 amps @ 120/240 VAC or 28 VDC (resistive load), 1/8 HP @120 VAC, inductive load
- Total current with both relays energized not to exceed 5 amps
**Life Expectancy:** 100 K cycles min. at full load rating. External RC snubber extends relay life for operation with inductive loads

**QUAD RELAY CARD**
- **Type:** Four FORM-A relays
- **Isolation To Sensor & User Input Commons:** 2300 Vrms for 1 min.
- **Working Voltage:** 250 Vrms

**Contact Rating:**
- One Relay Energized: 3 amps @ 240 VAC or 30 VDC (resistive load), 1/10 HP @120 VAC, inductive load
- Total current with all four relays energized not to exceed 4 amps
**Life Expectancy:** 100K cycles min. at full load. External RC snubber extends relay life for operation with inductive loads

**QUAD SINKING OPEN COLLECTOR CARD**
- **Type:** Four isolated sinking NPN transistors.
- **Isolation To Sensor & User Input Commons:** 500 Vrms for 1 min.
- **Working Voltage:** 50 V. Not Isolated from all other commons.

**Rating:** 100 mA max @ V_SAT = 0.7 V max. V_MAX = 30 V

**QUAD SOURCING OPEN COLLECTOR CARD**
- **Type:** Four isolated sourcing PNP transistors.
- **Isolation To Sensor & User Input Commons:** 500 Vrms for 1 min.
- **Working Voltage:** 50 V. Not Isolated from all other commons.

**Rating:** Internal supply: 24 VDC ± 10%, 30 mA max. total
- External supply: 30 VDC max., 100 mA max. each output

**ALL FOUR SETPOINT CARDS**
- **Response Time:** 200 msec. max. to within 99% of final readout value (digital filter and internal zero correction disabled)
- 700 msec. max. (digital filter disabled; internal zero correction enabled)
1.0 Installing the Meter

Installation

The DP63x00 meets NEMA 4X/IP65 requirements when properly installed. The unit is intended to be mounted into an enclosed panel. Prepare the panel cutout to the dimensions shown. Remove the panel latch from the unit. Slide the panel gasket over the rear of the unit to the back of the bezel. The unit should be installed fully assembled. Insert the unit into the panel cutout.

While holding the unit in place, push the panel latch over the rear of the unit so that the tabs of the panel latch engage in the slots on the case. The panel latch should be engaged in the farthest forward slot possible. To achieve a proper seal, tighten the latch screws evenly until the unit is snug in the panel (Torque to approximately 7 in-lbs [79N-cm]). Do not over-tighten the screws.

Installation Environment

The unit should be installed in a location that does not exceed the maximum operating temperature and provides good air circulation. Placing the unit near devices that generate excessive heat should be avoided.

The bezel should be cleaned only with a soft cloth and neutral soap product. Do NOT use solvents. Continuous exposure to direct sunlight may accelerate the aging process of the bezel.

Do not use tools of any kind (screwdrivers, pens, pencils, etc.) to operate the keypad of the unit.

2.0 Setting the Jumpers

The meter can have up to four jumpers that must be checked and/or changed prior to applying power. The following Jumper Selection Figures show an enlargement of the jumper area.

To access the jumpers, remove the meter base from the case by firmly squeezing and pulling back on the side rear finger tabs. This should lower the latch below the case slot (which is located just in front of the finger tabs). It is recommended to release the latch on one side, then start the other side latch.

Input Range Jumper

This jumper is used to select the proper input range. The input range selected in programming must match the jumper setting. Select a range that is high enough to accommodate the maximum input to avoid overloads. The selection is different for each meter. See the Jumper Selection Figure for appropriate meter.

Excitation Output Jumper

If your meter has excitation, this jumper is used to select the excitation range for the application. If excitation is not being used, it is not necessary to check or move this jumper.

User Input Logic Jumper

This jumper selects the logic state of all the user inputs. If the user inputs are not used, it is not necessary to check or move this jumper.

DP63700:

Signal Jumper

This jumper is used to select the signal type. For current signals, the jumper is installed. For voltage signals, remove the jumper from the board. (For 2 V inputs, this removed jumper can be used in the “2 V only” location.)

Couple Jumper

This jumper is used for AC/DC couple. If AC couple, then the jumper is removed from the board. If DC couple is used, then the jumper is installed.

DP63600 Jumper Selection

Input Range Jumper

One jumper is used for voltage/ohms or current input ranges. Select the proper input range high enough to avoid input signal overload. Only one jumper is allowed in this area. Do not have a jumper in both the voltage and current ranges at the same time. Avoid placing the jumper across two ranges.
DP63800 Jumper Selection

JUMPER SELECTIONS
The □ indicates factory setting.

Main Circuit Board

JUMPER SELECTIONS
The □ indicates factory setting.

CAUTION: To maintain the electrical safety of the meter, remove unneeded jumpers completely from the meter. Do not move the jumpers to positions other than those specified.

Signal Jumper
One jumper is used for the input signal type. For current signals, the jumper is installed. For voltage signals, remove the jumper from the board. (For 2 V inputs, this removed jumper can be used in the “2 V only” location.)

Couple Jumper
One jumper is used for AC / DC couple. If AC couple is used, then the jumper is removed from the board. If DC couple is used, then the jumper is installed.

DP63900 Jumper Selection

Bridge Excitation
One jumper is used to select bridge excitation to allow use of the higher sensitivity 24 mV input range. Use the 5 V excitation with high output (3 mV/V) bridges. The 5 V excitation also reduces bridge power compared to 10 V excitation.

A maximum of four 350 ohm load cells can be driven by the internal bridge excitation voltage.

Input Range Jumper
For most inputs, one jumper is used to select the input range. However, for the following ranges, set the jumpers as stated:
- 5 A: Remove all jumpers from the input range.
- 2 V: Install one jumper in “2/2V” position and one jumper in “2 V only”.
- All Other Ranges: One jumper in the selected range only.

Do not have a jumper in both the voltage and current ranges at the same time. Avoid placing a jumper across two ranges.
WIRING OVERVIEW

Electrical connections are made via screw-clamp terminals located on the back of the meter. All conductors should conform to the meter’s voltage and current ratings. All cabling should conform to appropriate standards of good installation, local codes and regulations. It is recommended that power supplied to the meter (DC or AC) be protected by a fuse or circuit breaker.

When wiring the meter, compare the numbers embossed on the back of the meter case against those shown in wiring drawings for proper wire position. Strip the wire, leaving approximately 0.3” (7.5 mm) bare lead exposed (stranded wires should be tinned with solder). Insert the lead under the correct screw-clamp terminal and tighten until the wire is secure. (Pull wire to verify tightness.) Each terminal can accept up to one #14 AWG (2.55 mm) wire, two #18 AWG (1.02 mm), or four #20 AWG (0.61 mm).

EMC INSTALLATION GUIDELINES

Although this meter is designed with a high degree of immunity to Electro-Magnetic Interference (EMI), proper installation and wiring methods must be followed to ensure compatibility in each application. The type of the electrical noise, its source or the method of coupling into the unit may be different for various installations. Listed below are some EMC guidelines for successful installation in an industrial environment.

1. The meter should be mounted in a metal enclosure, which is properly connected to protective earth.
2. With use of the lower input ranges or signal sources with high source impedance, the use of shielded cable may be necessary. This helps to guard against stray AC pick-up. Attach the shield to the input common of the meter. Line voltage monitoring and 5A CT applications do not usually require shielding.
3. To minimize potential noise problems, power the meter from the same power branch, or at least the same phase voltage as that of the signal source.
4. Never run Signal or Control cables in the same conduit or raceway with AC power lines, conductors feeding motors, solenoids, SCR controls, and heaters, etc. The cables should be run in metal conduit that is properly grounded. This is especially useful in applications where cable runs are long and portable two-way radios are used in close proximity or if the installation is near a commercial radio transmitter.
5. Signal or Control cables within an enclosure should be routed as far away as possible from contactors, control relays, transformers, and other noisy components.
6. In extremely high EMI environments, the use of external EMI suppression devices, such as ferrite suppression cores, is effective. Install them on Signal and Control cables as close to the unit as possible. Loop the cable through the core several times or use multiple cores on each cable for additional protection. Install line filters on the power input cable to the unit to suppress power line interference. Install them near the power entry point of the enclosure. The following EMI suppression devices (or equivalent) are recommended:
   - Ferrite Suppression Cores for signal and control cables:
     - Fair-Rite # 0443167251
     - TDK # ZCAT3035-1330A
     - Steward #28B2029-0A
   - Line Filters for input power cables:
     - Schaffner # FN610-1/07
     - Schaffner # FN670-1.8/07
     - Corcom #1VR3
   - Note: Reference manufacturer’s instructions when installing a line filter.
7. Long cable runs are more susceptible to EMI pickup than short cable runs. Therefore, keep cable runs as short as possible.
8. Switching of inductive loads produces high EMI. Use of snubbers across inductive loads suppresses EMI.

3.0 WIRING THE METER

3.1 POWER WIRING

AC Power
Terminal 1: VAC
Terminal 2: VAC

DC Power
Terminal 1: +VDC
Terminal 2: -VDC
3.2 INPUT SIGNAL WIRING

**DP63600 INPUT SIGNAL WIRING**

Before connecting signal wires, the Input Range Jumper and Excitation Jumper should be verified for proper position.

**Voltage Signal (self powered)**
- Terminal 3: +VDC
- Terminal 5: -VDC

**Current Signal (self powered)**
- Terminal 4: +ADC
- Terminal 5: -ADC

**Current Signal (2 wire requiring excitation)**
- Terminal 4: -ADC
- Terminal 6: +ADC
- Excitation Jumper: 24 V

**Current Signal (3 wire requiring excitation)**
- Terminal 4: +ADC (signal)
- Terminal 5: -ADC (common)
- Terminal 6: +Volt supply
- Excitation Jumper: 24 V

**Voltage Signal (3 wire requiring excitation)**
- Terminal 3: +VDC (signal)
- Terminal 5: -VDC (common)
- Terminal 6: +Volt supply
- Excitation Jumper: 24 V

**Resistance Signal (3 wire requiring excitation)**
- Terminal 3: Resistance
- Terminal 5: Resistance
- Terminal 6: Jumper to terminal 3
- Excitation Jumper: 1.75 mA REF.

**Potentiometer Signal (3 wire requiring excitation)**
- Terminal 3: Wiper
- Terminal 5: Low end of pot.
- Terminal 6: High end of pot.
- Excitation Jumper: 2 V REF.
- Input Range Jumper: 2 Volt
- Module 1 Input Range: 2 Volt

*Note: The Apply signal scaling style should be used because the signal will be in volts.*

**CAUTION:** Sensor input common is NOT isolated from user input common. In order to preserve the safety of the meter application, the sensor input common must be suitably isolated from hazardous live earth referenced voltages; or input common must be at protective earth ground potential. If not, hazardous live voltage may be present at the User Inputs and User Input Common terminals. Appropriate considerations must then be given to the potential of the user input common with respect to earth common; and the common of the isolated plug-in cards with respect to input common.

---

**DP63800 INPUT SIGNAL WIRING**

**Voltage Signal (self powered)**
- Terminal 3: +VDC
- Terminal 5: -VDC

**Current Signal (self powered)**
- Terminal 4: +ADC
- Terminal 5: -ADC

**Current Signal (2 wire requiring excitation)**
- Terminal 4: -ADC
- Terminal 6: +ADC

**Current Signal (3 wire requiring excitation)**
- Terminal 4: +ADC (signal)
- Terminal 5: -ADC (common)
- Terminal 6: +Volt supply

**Voltage Signal (3 wire requiring excitation)**
- Terminal 3: +VDC (signal)
- Terminal 5: -VDC (common)
- Terminal 6: +Volt supply

**CAUTION:** Sensor input common is NOT isolated from user input common. In order to preserve the safety of the meter application, the sensor input common must be suitably isolated from hazardous live earth referenced voltages; or input common must be at protective earth ground potential. If not, hazardous live voltage may be present at the User Inputs and User Input Common terminals. Appropriate considerations must then be given to the potential of the user input common with respect to earth common; and the common of the isolated plug-in cards with respect to input common.
### DP63700 INPUT SIGNAL WIRING

Before connecting signal wires, the Signal, Input Range and Couple Jumpers should be verified for proper position.

<table>
<thead>
<tr>
<th>Voltage Signal</th>
<th>Current Signal (Amps)</th>
<th>Current Signal (Milliamps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>300V MAX. AC</td>
<td>5A AC MAX.</td>
<td>200mA AC MAX.</td>
</tr>
<tr>
<td>Neutral</td>
<td>Load</td>
<td>Load</td>
</tr>
<tr>
<td>Line (+Hot)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line (-Hot)</td>
<td>40 mVDC MAX.</td>
<td></td>
</tr>
</tbody>
</table>

**CAUTION:** Connect only one input signal range to the meter. Hazardous signal levels may be present on unused inputs.

**CAUTION:** The isolation rating of the input common of the meter with respect to the option card commons and the user input common Terminal 8 (if used) is 125 Vrms; and 250 Vrms with respect to AC Power (meter Terminals 1 & 2). To be certain that the ratings are not exceeded, these voltages should be verified by a high-voltage meter before wiring the meter.

---

### DEADLOAD COMPENSATION

In some cases, the combined deadload and liveload output may exceed the range of the 24 mV input. To use this range, the output of the bridge can be offset a small amount by applying a fixed resistor across one arm of the bridge. This shifts the electrical output of the bridge downward to within the operating range of the meter. A 100 K ohm fixed resistor shifts the bridge output approximately -10 mV (350 ohm bridge, 10 V excitation).

Connect the resistor between +SIG and -SIG. Use a metal film resistor with a low temperature coefficient of resistance.

---

### DP63900 INPUT SIGNAL WIRING

Before connecting signal wires, the Input Range Jumper should be verified for proper position.

1. Where possible, connect the neutral side of the signal (including current shunts) to the input common of the meter. If the input signal is sourced from an active circuit, connect the lower impedance (usually circuit common) to the input signal common of the meter.
2. For phase-to-phase line monitoring where a neutral does not exist, or for any other signal input in which the isolation voltage rating is exceeded, an isolating potential transformer must be used to isolate the input voltage from earth. With the transformer, the input common of the meter can then be earth referenced for safety.
3. When measuring line currents, the use of a current transformer is recommended. If using external current shunts, insert the shunt in the neutral return line. If the isolation voltage rating is exceeded, the use of an isolating current transformer is necessary.

---

### DP63500 INPUT SIGNAL WIRING

**CAUTION:** Connect only one input signal range to the meter. Hazardous signal levels may be present on unused inputs.

**CAUTION:** The isolation rating of the input common of the meter with respect to the option card commons and the user input common Terminal 8 (if used) is 125 Vrms; and 250 Vrms with respect to AC Power (meter Terminals 1 & 2). To be certain that the ratings are not exceeded, these voltages should be verified by a high-voltage meter before wiring the meter.

---

**DEADLOAD COMPENSATION**

In some cases, the combined deadload and liveload output may exceed the range of the 24 mV input. To use this range, the output of the bridge can be offset a small amount by applying a fixed resistor across one arm of the bridge. This shifts the electrical output of the bridge downward to within the operating range of the meter. A 100 K ohm fixed resistor shifts the bridge output approximately -10 mV (350 ohm bridge, 10 V excitation).

Connect the resistor between +SIG and -SIG. Use a metal film resistor with a low temperature coefficient of resistance.

---

**BRIDGE COMPLETION RESISTORS**

For single strain gage applications, bridge completion resistors must be employed externally to the meter. Only use metal film resistors with a low temperature coefficient of resistance.

Load cells and pressure transducers are normally implemented as full resistance bridges and do not require bridge completion resistors.

---

**CAUTION:** Connect only one input signal range to the meter. Hazardous signal levels may be present on unused inputs.

**CAUTION:** The isolation rating of the input common of the meter with respect to the option card commons and the user input common Terminal 8 (if used) is 125 Vrms; and 250 Vrms with respect to AC Power (meter Terminals 1 & 2). To be certain that the ratings are not exceeded, these voltages should be verified by a high-voltage meter before wiring the meter.

---

**CAUTION:** Connect only one input signal range to the meter. Hazardous signal levels may be present on unused inputs.

**CAUTION:** The isolation rating of the input common of the meter with respect to the option card commons and the user input common Terminal 8 (if used) is 125 Vrms; and 250 Vrms with respect to AC Power (meter Terminals 1 & 2). To be certain that the ratings are not exceeded, these voltages should be verified by a high-voltage meter before wiring the meter.
3.3 USER INPUT WIRING

Before connecting the wires, the User Input Logic Jumper should be verified for proper position. If not using User Inputs, then skip this section. Only the appropriate User Input terminal has to be wired.

**Sinking Logic**
Terminal 8-10: Connect external switching device between Terminal 7: appropriate User Input terminal and User Comm.

In this logic, the user inputs of the meter are internally pulled up to +5 V with 22 K resistance. The input is active when it is pulled low (<0.9 V).

**Sourcing Logic**
Terminal 8-10: + VDC thru external switching device
Terminal 7: -VDC thru external switching device

In this logic, the user inputs of the meter are internally pulled down to 0 V with 22 K resistance. The input is active when a voltage greater than 3.6 VDC is applied.

**DP63700 ONLY**

**Sinking Logic**
Terminals 9-11: Connect external switching device between
Terminal 8: appropriate User Input terminal and User Comm.

In this logic, the user inputs of the meter are internally pulled up to +5 V with 22 K resistance. The input is active when it is pulled low (<0.9 V).

**Sourcing Logic**
Terminals 9-11: + VDC through external switching device
Terminal 8: -VDC through external switching device

In this logic, the user inputs of the meter are internally pulled down with 22 K resistance. The input is active when a voltage greater than 3.6 VDC is applied.

3.4 SETPOINT (ALARMS) WIRING
3.5 SERIAL COMMUNICATION WIRING
3.6 ANALOG OUTPUT WIRING

See appropriate plug-in card bulletin for details.

4.0 REVIEWING THE FRONT BUTTONS AND DISPLAY

**Display Readout Legends**
MAX
MIN
TOT

SP1
SP2
SP3
SP4
DSP
PAR
F1▼
F2▼
RST

Optional Custom Units Overlay

Setpoint Alarm Annunciators

<table>
<thead>
<tr>
<th>BUTTON</th>
<th>DISPLAY MODE OPERATION</th>
<th>PROGRAMMING MODE OPERATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSP</td>
<td>Index display through max/min/total/input readouts</td>
<td>Quit programming and return to display mode</td>
</tr>
<tr>
<td>PAR</td>
<td>Access parameter list</td>
<td>Store selected parameter and index to next parameter</td>
</tr>
<tr>
<td>F1▼</td>
<td>Function key 1; hold for 3 seconds for Second Function 1**</td>
<td>Increment selected parameter value</td>
</tr>
<tr>
<td>F2▼</td>
<td>Function key 2; hold for 3 seconds for Second Function 2**</td>
<td>Decrement selected parameter value</td>
</tr>
<tr>
<td>RST</td>
<td>Reset (Function key)**</td>
<td>Hold with F1▼, F2▼ to scroll value by x1000</td>
</tr>
</tbody>
</table>

* Display Readout Legends may be locked out in Factory Settings.

** Factory setting for the F1, F2, and RST keys is NO mode.
5.0 PROGRAMMING THE METER

PROGRAMMING MENU

DISPLAY MODE

Par

PRO

Parameter

Selection/Value

Display/Program
Lock-out
Parameters

Secondary
Function
Parameters

Totalizer
(Integrator)
Parameters

Setpoint*
(Alarm)
Parameters

Serial*
Communication
Parameters

Analog*
Output
Parameters

Factory
Service
Operations

PROGRAMMING MODE

Two programming modes are available.

Full Programming Mode permits all parameters to be viewed and modified.

Upon entering this mode, the front panel keys change to Programming Mode operations. This mode should not be entered while a process is running, since the meter functions and User Input response may not operate properly while in Full Programming Mode.

Quick Programming Mode permits only certain parameters to be viewed and/or modified. When entering this mode, the front panel keys change to Programming Mode operations, and all meter functions continue to operate properly.

Quick Programming Mode is configured in Module 3. The Display Intensity Level “ªlsfu” parameter is available in the Quick Programming Mode only when the security code is non-zero. For a description, see Module 9—Factory Service Operations. Throughout this document, Programming Mode (without Quick in front) always refers to “Full” Programming Mode.

PROGRAMMING TIPS

The Programming Menu is organized into nine modules (See above). These modules group together parameters that are related in function. It is recommended to begin programming with Module 1 and proceed through each module in sequence. Note that Modules 6 through 8 are only accessible when the appropriate plug-in card is installed. If lost or confused while programming, press the DSP key to exit programming mode and start over.

FACTORY SETTINGS

Factory Settings may be completely restored in Module 9. This is a good starting point if encountering programming problems. Throughout the module description sections which follow, the factory setting for each parameter is shown below the parameter display. In addition, all factory settings are listed on theParameter Value Chart following the programming section.

ALTERNATING SELECTION DISPLAY

In the module description sections which follow, the dual display with arrows appears for each programming parameter. This is used to illustrate the display alternating between the parameter (top display) and the parameter’s Factory Setting (bottom display). In most cases, selections or value ranges for the parameter will be listed on the right.

STEP BY STEP PROGRAMMING INSTRUCTIONS:

PROGRAMMING MODE ENTRY (PAR KEY)

The Programming Mode is entered by pressing the PAR key. If this mode is not accessible, then meter programming is locked by either a security code or a hardware lock. (See Modules 2 and 3 for programming lock-out details.)

MODULE ENTRY (ARROW & PAR KEYS)

Upon entering the Programming Mode, the display alternates between the parameter display and the parameter’s Value display. Each of these displays can be locked from view through programming. (See Module 3) The Input Display Value is shown with no annunciator.

PARAMETER (MODULE) MENU (PAR KEY)

Each module has a separate parameter menu. These menus are shown at the start of each module description section which follows. The PAR key is pressed to select the desired module, which is then entered by pressing the PAR key.

PARAMETER SELECTION ENTRY (ARROW & PAR KEYS)

For each parameter, the display alternates between the parameter and the present selection or value for that parameter. For parameters which have a list of selections, the arrow keys (F1 and F2) are used to sequence through the list until the desired selection is displayed. Pressing the PAR key stores and activates the displayed selection, and also advances the meter to the next parameter.

NUMERICAL VALUE ENTRY (ARROW, RST & PAR KEYS)

For parameters which require a numerical value entry, the arrow keys can be used to increment or decrement the display to the desired value. When an arrow key is pressed and held, the display automatically scrolls up or scrolls down. The longer the key is held, the faster the display scrolls.

The RST key can be used in combination with the arrow keys to enter large numerical values. When the RST key is pressed along with an arrow key, the display scrolls by 1000’s. Pressing the PAR key stores and activates the displayed value, and also advances the meter to the next parameter.

PROGRAMMING MODE EXIT (DSP KEY or PAR KEY at Pr. 15)

The Programming Mode is exited by pressing the DSP key or the PAR key. The Programming Menu is re-entered.

OVERVIEW
5.1 MODULE 1 - SIGNAL INPUT PARAMETERS (I-INP)

**DP63700 INPUT RANGE**

<table>
<thead>
<tr>
<th>RANGE</th>
<th>SELECTION</th>
<th>RESOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>200µA</td>
<td>±200.00 µA</td>
<td>2µ</td>
</tr>
<tr>
<td>0.0002A</td>
<td>±2.0000 mA</td>
<td>20µ</td>
</tr>
<tr>
<td>0.002A</td>
<td>±20.00 mA</td>
<td>300µ</td>
</tr>
<tr>
<td>0.2A</td>
<td>±200.00 mA</td>
<td>1000µ</td>
</tr>
<tr>
<td>2A</td>
<td>±2.0000 A</td>
<td>10000µ</td>
</tr>
<tr>
<td>0.2µ</td>
<td>±200.00 mV</td>
<td>10V</td>
</tr>
</tbody>
</table>

Select the input range that corresponds to the external signal. This selection should be high enough to avoid input signal overload but low enough for the desired input resolution. This selection and the position of the Input Range Jumper must match.

**DP63500 INPUT TYPE**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>SELECTION</th>
<th>TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tc-c</td>
<td>TC</td>
<td>C TC</td>
</tr>
<tr>
<td>Tc-e</td>
<td>E TC</td>
<td>Pt-385 RTD platinum 385</td>
</tr>
<tr>
<td>Tc-j</td>
<td>J TC</td>
<td>Pt-392 RTD platinum 392</td>
</tr>
<tr>
<td>Tc-P</td>
<td>P TC</td>
<td>N-6.12 RTD nickel 672</td>
</tr>
<tr>
<td>Tc-R</td>
<td>R TC</td>
<td>Cu-427 RTD copper 10 Ω</td>
</tr>
<tr>
<td>Tc-S</td>
<td>S TC</td>
<td>Cs-tc Custom TC</td>
</tr>
<tr>
<td>Tc-b</td>
<td>B TC</td>
<td>Cs-rh Custom RTO High</td>
</tr>
<tr>
<td>Tc-n</td>
<td>N TC</td>
<td>Cs-rl Custom RTO Low</td>
</tr>
</tbody>
</table>

Select the input type that corresponds to the input sensor. For RTD types, check the RTD Input Jumper for matching selection. For custom types, the Temperature Scale parameter is not available, the Display Decimal Point is expanded, and Custom Sensor Scaling must be completed.

**DP63900 INPUT RANGE**

Select the input range that corresponds to the external signal. This selection should be high enough to avoid input signal overload but low enough for the desired input resolution. This selection and the position of the Input Range Jumper must match.

**DP63500 TEMPERATURE SCALE**

Select the temperature scale. This selection applies for Input, MAX, MIN, and TOT displays. This does not change the user installed Custom Units Overlay display. If changed, those parameters that relate to the temperature scale should be checked. This selection is not available for custom sensor types.

**DISPLAY DECIMAL POINT**

Select the decimal point location for the Input, MAX and MIN displays. (The TOT display decimal point is a separate parameter.) This selection also affects round, dSP1 and dSP2 parameters and setpoint values.

Refer to the appropriate Input Range for the selected meter. Use only one Input Range, then proceed to Display Decimal Point.

The input signal can be either AC coupled (rejecting the DC components of the signal) or DC coupled (measures both the AC and DC components of the signal). The coupling jumper and the setting of this parameter must match.
DISPLAY Rounding*

Rounding selections other than one, cause the Input Display to ‘round’ to the nearest rounding increment selected (ie. rounding of ‘5’ causes 122 to round to 120 and 123 to round to 125). Rounding starts at the least significant digit of the Input Display. Remaining parameter entries (scaling point values, setpoint values, etc.) are not automatically adjusted to this rounding display selection.

DP63500: TEMPERATURE DISPLAY OFFSET*

The temperature display can be corrected with an offset value. This can be used to compensate for probe errors, errors due to variances in probe placement or adjusting the readout to a reference thermometer. This value is automatically updated after a Zero Display to show how far the display is offset. A value of ‘0’ does not require this setting. To derive this slope, use \( \mu V \) data obtained from thermocouple manufacturers’ tables for two points between 0°C and 50°C. Place this corresponding \( \mu V \) and °C information into the equation:

\[
\text{slope} = (\mu V_2 - \mu V_1)/(C_2 - C_1).
\]

Due to the nonlinear output of thermocouples, the compensation may show a small offset error at room temperatures. This can be compensated by the offset parameter. A value of 0 disables internal compensation when the thermocouple is externally compensated.

DP63500: ICE POINT SLOPE

This parameter sets the slope value for ice point compensation for the Custom TC range (C5-C10) only. The fixed thermocouple ranges are automatically compensated by the meter and do not require this setting. To calculate this slope, use \( \mu V \) data obtained from thermocouple manufacturer’s tables for two points at 0°C and 50°C. Place this corresponding \( \mu V \) and °C information into the equation:

\[
\text{slope} = (\mu V_2 - \mu V_1)/(C_2 - C_1).
\]

Due to the nonlinear output of thermocouples, the compensation may show a small offset error at room temperatures. This can be compensated by the offset parameter. A value of 0 disables internal compensation when the thermocouple is externally compensated.

FILTER BAND*

The digital filter will adapt to variations in the input signal. When the variation exceeds the input filter band value, the digital filter disengages. When the variation becomes less than the band value, the filter engages again. This allows for a stable readout, but permits the display to settle rapidly after a large process change. The value of the band is in display units. A band setting of ‘0’ keeps the digital filter permanently engaged.

FILTER Setting*

The input filter setting is a time constant expressed in tenths of a second. The filter settles to 99% of the final display value within approximately 3 time constants. This is an Adaptive Digital Filter which is designed to steady the Input Display reading. A value of ‘0’ disables filtering.

SCALING STYLE

This parameter does not apply for the DP63500. Scaling values for the DP63500 must be keyed-in.

INPUT VALUE FOR SCALING POINT 1

For Key-in (PEY), enter the known first Input Value by using the arrow keys. (The Input Range selection sets up the decimal location for the Input Value). For Apply (RPLY), apply the input signal to the meter, adjust the signal source externally until the desired Input Value appears. In either method, press the PAR key to enter the value being displayed.

Note: RPLY style - Pressing the RST key will advance the display to the next scaling display point without storing the input value.


**DISPLAY VALUE FOR SCALING POINT 2**

Enter the second coordinating Display Value by using the arrow keys. This is the same for **PES** and **RPL**. (Follow the same procedure if using more than two scaling points.)

**General Notes on Scaling**

1. Input Values for scaling points should be confined to the limits of the Input Range Jumper position.
2. The same Input Value should not correspond to more than one Display Value. (Example: 20 mA can not equal 0 and 10.) This is referred to as read out jumps (vertical scaled segments).
3. The same Display Value can correspond to more than one Input Value. (Example: 0 mA and 20 mA can equal 10.) This is referred to as readout dead zones (horizontal scaled segments).

**5.2 MODULE 2 - USER INPUT AND FRONT PANEL FUNCTION KEY PARAMETERS (2-FAC)**

The three user inputs are individually programmable to perform specific meter control functions. While in the Display Mode or Program Mode, the function is executed the instant the user input transitions to the active state.

The front panel function keys are also individually programmable to perform specific meter control functions. While in the Display Mode, the primary function is executed the instant the key is pressed. Holding the function key for three seconds executes a secondary function. It is possible to program a secondary function without a primary function.

In most cases, if more than one user input and/or function key is programmed for the same function, the maintained (level trigger) actions will be performed while at least one of those user inputs or function keys is activated. The momentary (edge trigger) actions will be performed every time any of those user inputs or function keys transition to the active state.

**Note:** In the following explanations, not all selections are available for both user inputs and front panel function keys. Alternating displays are shown with each selection. Those selections showing both displays are available for both. If a display is not shown, it is not available for that selection. **USr-1** will represent all three user inputs. **F1** will represent all five function keys.

**NO FUNCTION**

No function is performed if activated. This is the factory setting for all user inputs and function keys. No function can be selected without affecting basic start-up.

**PROGRAMMING MODE LOCK-OUT**

Programming Mode is locked-out, as long as activated (maintained action). A security code can be configured to allow programming access during lock-out.

**ZERO (TARE) DISPLAY**

The Zero (Tare) Display provides a way to zero the Input Display value at various input levels, causing future Display readings to be offset. This function is useful in weighing applications where the container or material on the scale should not be included in the next measurement value. When activated (momentary action), **rSEL** flashes and the Display is set to zero. At the same time, the Display value (that was on the display before the Zero Display) is subtracted from the Display Offset Value and is automatically stored as the new Display Offset Value (**OFF**). If another Zero (tare) Display is performed, the display will again change to zero and the Display reading will shift accordingly.

**RELATIVE/ABSOLUTE DISPLAY**

This function will switch the Input Display between Relative and Absolute. The Relative is a net value that includes the Display Offset Value. The Input Display will normally show the Relative unless switched by this function. Regardless of the display selected, all meter functions continue to operate based on relative values. The Absolute is a gross value (based on Module 1 **DSP** and **INP** entries) without the Display Offset Value. The Absolute display is selected as long as the user input is activated (maintained action) or at the transition of the function key (momentary action). When the user input is released, or the function key is pressed again, the input display switches back to Relative display. **dSEL** (absolute) or **rSEL** (relative) is momentarily displayed at transition to indicate which display is active.
HOLD DISPLAY
The shown display is held but all other meter functions continue as long as activated (maintained action).

HOLD ALL FUNCTIONS
The meter disables processing the input, holds all display contents, and locks the state of all outputs as long as activated (maintained action). The serial port continues data transfer.

SYNCHRONIZE METER READING
The meter suspends all functions as long as activated (maintained action). When the user input is released, the meter synchronizes the restart of the A/D with other processes or timing events.

STORE BATCH READING IN TOTALIZER
The Input Display value is one time added (batched) to the Totalizer at transition to activate (momentary action). The Totalizer retains a running sum of each batch operation until the Totalizer is reset. When this function is selected, the normal operation of the Totalizer is overridden.

SELECT TOTALIZER DISPLAY
The Totalizer display is selected as long as activated (maintained action). When the user input is released, the Input Display is returned. The DSP key overrides the active user input display but not the Maximum function.

RESET TOTALIZER
When activated (momentary action), the Maximum value is set to the present Input Display value. The Maximum function then continues from that value. This selection functions independent of the selected display.

RESET, SELECT, ENABLE MAXIMUM DISPLAY
When activated (momentary action), the Maximum value is set to the present Input Display value. Maximum continues from that value while active (maintained action). When the user input is released, Maximum detection stops and holds its value. This selection functions independent of the selected display. The DSP key overrides the active user input display but not the Maximum function.

SELECT MINIMUM DISPLAY
The Minimum display is selected as long as activated (maintained action). When the user input is released, the Input Display is returned. The Minimum function then continues from that value. This selection functions independent of being displayed.

RESET MINIMUM
When activated (momentary action), the Minimum value is set to the present Input Display value. Minimum continues from that value while active (maintained action). When the user input is released, Minimum detection stops and holds its value. This selection functions independent of the selected display. The DSP key overrides the active user input display but not the Minimum function.

RESET MAXIMUM AND MINIMUM
When activated (momentary action), the Maximum and Minimum readings are set to the present Input Display value. The Maximum and Minimum function then continues from that value. This selection functions independent of the selected display.

CHANGE DISPLAY INTENSITY LEVEL
When activated (momentary action), the display intensity changes to the next intensity level (of 4). The four levels correspond to Display Intensity Level (d-L) settings of 0, 3, 8, and 15. The intensity level, when changed via the User Input/ Function Key, is not retained at power-down, unless Quick Programming or Full Programming mode is entered and exited. The meter will power-up at the last saved intensity level.
SETPOINT SELECTIONS

The following selections are accessible only with the Setpoint plug-in card installed. Refer to the Setpoint Card Bulletin shipped with the Setpoint plug-in card for an explanation of their operation.

Setpoint Card Only

- L1Se - Select main or alternate setpoints
- r'1 - Reset Setpoint 1 (Alarm 1)
- r'2 - Reset Setpoint 2 (Alarm 2)
- r'3 - Reset Setpoint 3 (Alarm 3)
- r'4 - Reset Setpoint 4 (Alarm 4)
- r'34 - Reset Setpoint 3 & 4 (Alarm 3 & 4)
- r'234 - Reset Setpoint 2, 3 & 4 (Alarm 2, 3 & 4)
- r'ALL - Reset Setpoint All (Alarm All)

The following selections are accessible only with the Setpoint plug-in card installed. Refer to the Setpoint Card Bulletin shipped with the Setpoint plug-in card for an explanation of their operation.

PRINT REQUEST

The meter issues a block print through the serial port when activated. The data transmitted during a print request is programmed in Module 7. If the user input is still active after the transmission is complete (about 100 msec), an additional transmission occurs. As long as the user input is held active, continuous transmissions occur.

5.3 MODULE 3 - DISPLAY AND PROGRAM LOCK-OUT

PARAMETERS (3-Lc)

Module 3 is the programming for Display lock-out and “Full” and “Quick” Program lock-out.

When in the Display Mode, the available displays can be read consecutively by repeatedly pressing the DSP key. An annunciator indicates the display being shown. These displays can be locked from being visible. It is recommended that the display be set to Lc when the corresponding function is not used.

“Full” Programming Mode permits all parameters to be viewed and modified. This Programming Mode can be locked with a security code and/or user input. When locked and the PAR key is pressed, the meter enters a Quick Programming Mode. In this mode, the setpoint values can still be read and/or changed per the selections below. The Display Intensity Level (d+Lt4) parameter also appears whenever Quick Programming Mode is enabled and the security code is greater than zero.

PROGRAM MODE SECURITY CODE*

By entering any non-zero value, the prompt Code 0 will appear when trying to access the Program Mode. Access will only be allowed after entering a matching security code or universal code of 222. With this lock-out, a user input would not have to be configured for Program Lock-out. However, this lock-out is overridden by an inactive user input configured for Program Lock-out.

Throughout this document, Programming Mode (without Quick in front) always refers to “Full” Programming (all meter parameters are accessible).
MAX CAPTURE DELAY TIME*

When the Input Display is above the present MAX value for the entered delay time, the meter will capture that display value as the new MAX reading. A delay time helps to avoid false captures of sudden short spikes.

MIN CAPTURE DELAY TIME*

When the Input Display is below the present MIN value for the entered delay time, the meter will capture that display value as the new MIN reading. A delay time helps to avoid false captures of sudden short spikes.

DISPLAY UPDATE RATE*

This parameter determines the rate of display update. When set to 20 updates/second, the internal re-zero compensation is disabled, allowing for the fastest possible output response.

DP63900: AUTO-ZERO TRACKING

The meter can be programmed to automatically compensate for zero drift. Drift may be caused by changes in the transducers or electronics, or accumulation of material on weight systems.

Auto-zero tracking operates when the readout remains within the tracking band for a period of time equal to the tracking delay time. When these conditions are met, the meter re-zeroes the readout. After the re-zero operation, the meter resets and continues to auto-zero track.

The auto-zero tracking band should be set large enough to track normal zero drift, but small enough to not interfere with small process inputs.

For filling operations, the fill rate must exceed the auto-zero tracking rate. This avoids false tracking at the start of the filling operation.

Fill Rate ≥ tracking band
tracking time

Auto-zero tracking is disabled by setting the auto-zero tracking parameter = 0.

DP63900: ICE POINT COMPENSATION*

This parameter turns the internal ice point compensation on or off. Normally, the ice point compensation is on. If using external compensation, set this parameter to off. In this case, use copper leads from the external compensation point to the meter. If using Custom TC range, the ice point compensation can be adjusted by a value in Module 1 when this is yes.

* Factory Setting can be used without affecting basic start-up.

UNITS LABEL BACKLIGHT*

The Units Label Kit Accessory contains a sheet of custom unit overlays which can be installed into the meter’s bezel display assembly. The backlight for these custom units is activated by this parameter.

DISPLAY OFFSET VALUE*

This parameter does not apply for the DP63500.

Unless a Zero Display was performed or an offset from Module 1 scaling is desired, this parameter can be skipped. The Display Offset Value is the difference from the Absolute (gross) Display value to the Relative (net) Display value for the same input level. The meter will automatically update this Display Offset Value after each Zero Display. The Display Offset Value can be directly keyed-in to intentionally add or remove display offset. See Relative / Absolute Display and Zero Display explanations in Module 2.
The totalizer accumulates (integrates) the Input Display value using one of two modes. The first is using a time base. This can be used to compute a time-temperature product. The second is through a user input or function key programmed for Batch (one time add on demand). This can be used to provide a readout of temperature integration, useful in curing and sterilization applications. If the Totalizer is not needed, its display can be locked-out and this module can be skipped during programming.

TOTALIZER DECIMAL POINT*

For most applications, this matches the Input Display Decimal Point \( dECPb \). If a different location is desired, refer to Totalizer Scale Factor.

TOTALIZER TIME BASE

\[ \text{BASE} \quad \text{SEC} \times \text{seconds} \left( \times 1 \text{ hour} \times 3600 \right) \]

\[ \text{IN} \times \text{ minutes} \left( \div 60 \right) \]

This is the time base used in Totalizer accumulations. If the Totalizer is being accumulated through a user input programmed for Batch, then this parameter does not apply.

TOTALIZER SCALE FACTOR*

\[ \text{SCFRAC} \quad 1 \text{ to } 65,000 \]

For most applications, the Totalizer reflects the same decimal point location and engineering units as the Input Display. In these cases, the Totalizer Scale Factor is 1.000. The Totalizer Scale Factor can be used to scale the Totalizer to a different value as the Input Display. Common possibilities are:

1. Changing decimal point location (example tenths to whole)
2. Average over a controlled time frame.

Details on calculating the scale factor are shown later.

If the Totalizer is being accumulated through a user input programmed for Batch, then this parameter does not apply.

TOTALIZER LOW CUT VALUE*

\[ \text{LOcut} \quad -19999 \text{ to } 99999 \]

A low cut value disables Totalizer when the Input Display value falls below the value programmed.

TOTALIZER POWER UP RESET*

\[ \text{P-UP} \quad \text{NO} \quad \text{Do not reset buffer} \]

The Totalizer can be reset to zero on each meter power-up by setting this parameter to reset.

* Factory Setting can be used without affecting basic start-up.
## 5.6 MODULE 6 - SETPOINT (ALARM) PARAMETERS (6-SPt)

<table>
<thead>
<tr>
<th>Parameter Menu</th>
<th>DP63500 ONLY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SPSEL</strong></td>
<td><strong>SP-n</strong></td>
</tr>
<tr>
<td>Setpoint Select</td>
<td>Setpoint Action</td>
</tr>
</tbody>
</table>

- **SP-n - SELECT SETPOINT**
  - NO SP-1 SP-3
  - SP-2 SP-4

- **ACE-n - SETPOINT ACTION**
  - OFF
  - dE-H1
dE-L0
  - Ab-H1
dE-L0
  - Ab-LO bAND
  - AU-H1
totLO
  - AU-LO totHI

- **SP-n - SETPOINT VALUE**
  - -19999 to 99999

- **HYS-n - SETPOINT Hysteresis**
  - 1 to 65000

- **lDN-n - ON TIME DELAY**
  - 00 to 32760 sec

- **lOF-n - OFF TIME DELAY**
  - 00 to 32760 sec

- **out-n - OUTPUT LOGIC**
  - nor rEu

- **rSt-n - RESET ACTION**
  - AuTa LREC2
  - LREC1

- **Stb-n - STANDBY OPERATION**
  - NO YES

- **L It-n - SETPOINT ANNUNCIATORS**
  - OFF rEu
  - nor FLASH

- **brn-n - PROBE BURN-OUT ACTION**
  - ON OFF

Repeat programming for each setpoint.

## 5.7 MODULE 7 - SERIAL COMMUNICATIONS PARAMETERS (7-SrL)

<table>
<thead>
<tr>
<th>Parameter Menu</th>
<th>DP63900 ONLY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>bAud</strong></td>
<td><strong>dAls</strong></td>
</tr>
<tr>
<td>Baud Rate</td>
<td>Data Bits</td>
</tr>
</tbody>
</table>

- **bAud - BAUD RATE**
  - 300 4800
  - 600 9600
  - 1200 19200
  - 2400

- **dAls - DATA BITS**
  - 7 8

- **PRr - PARITY BIT**
  - Odd
  - NO
  - EVEN

- **Addr - METER ADDRESS**
  - 0 to 99

- **Abru - ABBREVIATED PRINTING**
  - NO YES

- **DPl - PRINT OPTIONS**
  - NO
  - YES Grss LArE
  - INP H ILO
tot SPnl

These two options are for the DP63900 ONLY.

## 5.8 MODULE 8 - ANALOG OUTPUT PARAMETERS (8-Out)

<table>
<thead>
<tr>
<th>Parameter Menu</th>
<th>DP63500 ONLY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8-Out</strong></td>
<td><strong>TYPE</strong></td>
</tr>
<tr>
<td>Analog Type</td>
<td>Analog Assignment</td>
</tr>
</tbody>
</table>

- **TYPE - ANALOG TYPE**
  - 0-20 0-10
  - 4-20

- **RS In - ANALOG ASSIGNMENT**
  - INP LO
  - H1 tot

- **AN-LD - ANALOG LOW SCALE VALUE**
  - -19999 to 99999

- **AN-HI - ANALOG HIGH SCALE VALUE**
  - -19999 to 99999

- **udt - ANALOG UPDATE TIME**
  - 00 to 100 sec.

- **burn - PROBE BURN-OUT ACTION**
  - DP63500 ONLY
  - H1 LO

Modules 6, 7, and 8 are accessible only with the appropriate plug-in cards installed. A quick overview of each Module is listed below. Refer to the corresponding plug-in card bulletin for a more detailed explanation of each parameter selection.
DP63800 - Input Calibration

**WARNING:** Calibration of this meter requires a signal source with an accuracy of 0.01% or better and an external meter with an accuracy of 0.005% or better.

Before starting, verify that the precision signal source is connected to the correct terminals and ready. Allow a 30 minute warm-up period before calibrating the meter. **ne** and **PAR** can be chosen to exit the calibration mode without any changes taking place.

Then perform the following procedure:
1. Use the arrow keys to display **Code 48** and press **PAR**.
2. Choose the range to be calibrated by using the arrow keys and press **PAR**. (**ne** and **PAR** can be chosen to exit the calibration mode without any changes taking place.)
3. When the zero range limit appears on the display, apply the appropriate:
   - Voltage range: dead short applied
   - Current range: open circuit
4. Press **PAR** and ・・・ will appear on the display for about 10 seconds.
5. When the top range limit appears on the display, apply the appropriate:
   - Voltage range: 10 VDC
   - Current range: 20 mA
6. Press **PAR** and ・・・ will appear on the display for about 10 seconds.
7. When **ne** appears, press **PAR** twice.
8. If the meter is not field scaled, then the input display should match the value of the input signal.
9. Repeat the above procedure for each input range to be calibrated.

DP63700 - Input Calibration

**WARNING:** In the DP63700, DC signals are used to calibrate the AC ranges. Calibration of the DP63700 requires a DC voltmeter with an accuracy of 0.025% and a precision DC signal source capable of:
1. 1% of full scale, DC
2. -1% of full scale, DC
3. +100% of full scale, DC; (300 V range = +100 V calibration)
4. -100% of full scale, DC; (300 V range = -100 V calibration)

Before starting, verify the Input Range and Signal Jumpers are set for the range to be calibrated and the Couple jumper is installed for DC. Also verify the DC signal source is connected and ready. Allow a 30 minute warm-up period before calibrating the meter. **ne** and **PAR** can be chosen to exit the calibration mode without any changes taking place.

Then perform the following procedure:
1. Press the arrow keys to display **Code 48** and press **PAR**.
2. The meter displays ・・・. Use the arrow keys to select the range that matches the Signal Jumper setting. Press **PAR**.
3. Apply the signal matching the meter prompt.
4. Press **PAR** and ・・・ will appear on the display, wait for next prompt.
5. Repeat steps 3 and 4 for the remaining three prompts.
6. When **ne** appears, press **PAR** twice.
7. If the meter is scaled to show input signal, the Input Display should match the value of the input signal in the Display Mode.
8. Repeat the above procedure for each range to be calibrated or to recalibrate the same range. It is only necessary to calibrate the input ranges being used.
9. When all desired calibrations are completed, remove the external signal source and restore original configuration and jumper settings. If AC is being measured, continue with AC Couple Offset Calibration.
AC Couple Offset Calibration - DP63700

It is recommended that Input Calibration be performed first.

1. With meter power removed, set the Input Range Jumper for 20 V, the Coupler Jumper for DC, and set the Signal Jumper for voltage by removing the jumper.
2. Connect a wire (short) between Volt (terminal 6) and COMM (terminal 4).
3. Apply meter power.
4. In Module 1, program as follows: Range: 20u; Couple: AC; Decimal Point: 0; Round: f; Filter: 05; Band: 20; Points: 2; Style: YES; INP1: 0000; DSP1: 0; INP2: 20000; DSP2: 20000
5. In Module 2, program as follows: Hi-t: 00; Lo-t: 3711
6. Press PAR then DSP to exit programming and view the Input Display.
7. The readout displays the DC coupled zero input, record the value.
8. Remove the meter power and set the Couple Jumper to AC by removing the jumper.
9. Maintaining the short between terminals 4 and 6, reapply the meter power.
10. Keeping all programming the same, view the Input Display.

11. Press the down arrow key twice to exit programming.
12. Calculate the offset (DC coupled reading) using the following formula:
   \[ \text{OFFSET} = \text{AC coupled reading (step 11)} - \text{DC coupled reading (step 7)} \]
13. Use the arrow keys to enter the calculated \[ \text{OFFSET} \]
14. Press PAR three times, to exit programming.
15. Remove the meter power and remove the short from terminals 4 and 6.
16. Restore the original jumper and configuration settings.

DP63900 - Input Calibration

**WARNING:** Calibration of this meter requires a signal source with an accuracy of 0.01% or better and an external meter with an accuracy of 0.005% or better.

Before starting, connect -SIG (terminal 4) to COMM (terminal 5). This allows a single ended signal to be used for calibration. Connect the calibration signal to +SIG (terminal 3) and -SIG (terminal 4). Verify the Input Jumper is in the desired position. Allow a 30 minute warm-up period before calibrating the meter. \[ \text{ne} \] and \[ \text{PAR} \] can be chosen to exit the calibration mode without any changes taking place. Perform the following procedure:

1. Press the arrow keys to display \[ \text{LaDE} \; \text{4B} \] and press \[ \text{PAR} \].
2. Choose the range to be calibrated by using the arrow keys and press \[ \text{PAR} \].
3. When the zero range limit appears on the display, apply 0 mV between +SIG and -SIG.
4. Press \[ \text{PAR} \] and --- will appear, wait for next prompt.
5. When the top range limit appears on the display, apply the corresponding +SIG and -SIG voltage (20 mV or 200 mV).
6. Press \[ \text{PAR} \] and --- will appear, on the display for about 10 seconds.
7. When \[ \text{NO} \] appears, press \[ \text{PAR} \] twice to exit programming.
8. Repeat the above procedure for each range to be calibrated or recalibrate the same range. It is only necessary to calibrate the input ranges being used.
9. When all desired calibrations are completed, remove -SIG to COMM connection and external signal source.
10. Restore original configuration and jumper settings.

DP63500 - Input Calibration

**WARNING:** Calibration of this meter requires precision instrumentation operated by qualified technicians. It is recommended that a calibration service calibrate the meter.

Before selecting any of the calibration procedures, the input to the meter must be at 0 mV or 0 ohms. Set the digital filter in Module 1 to 1 second. Allow a 30 minute warm-up period before calibrating the meter. The \[ \text{ne} \] and \[ \text{PAR} \] can be chosen to exit calibration mode without any changes taking place.

10 OHM RTD Range Calibration
1. Set the Input Range Jumper to 10 ohm.
2. Use the arrow keys to display \[ \text{LaDE} \; \text{4B} \] and press \[ \text{PAR} \]. Then choose \( r \) and press \[ \text{PAR} \].
3. At \[ 0 \; \text{r} \], apply a direct short to input terminals 3, 4 and 5 using a three wire link. Wait 10 seconds, then press \[ \text{PAR} \].
4. At \[ 15 \; \text{r} \], apply a precision resistance of 15 ohms (with an accuracy of 0.01% or better) using a three wire link, to input terminals 3, 4 and 5. Wait 10 seconds, then press \[ \text{PAR} \].
5. Connect the RTD, return to the Display Mode and verify the input reading (with 0 Display Offset) is correct. If not correct repeat calibration.

100 OHM RTD Range Calibration
1. Set the Input Range Jumper to 100 ohm.
2. Use the arrow keys to display \[ \text{LaDE} \; \text{4B} \] and press \[ \text{PAR} \]. Then choose \( r \) and press \[ \text{PAR} \].
3. At \( r \), apply a direct short to input terminals 3, 4 and 5 using a three wire link. Wait 10 seconds, then press \[ \text{PAR} \].
4. At \[ 300 \; \text{r} \], apply a precision resistance of 300 ohms (with an accuracy of 0.01% or better) using a three wire link, to terminals 3, 4 and 5. Wait 10 seconds, then press \[ \text{PAR} \].
5. Connect the RTD, return to the Display Mode and verify the input reading (with 0 Display Offset) is correct. If not correct repeat calibration.

THERMOCOUPLE Range Calibration
1. Use the arrow keys to display \[ \text{LaDE} \; \text{4B} \] and press \[ \text{PAR} \]. Then choose \[ \text{ICE} \] and press \[ \text{PAR} \].
2. At \[ 0 \; \text{u} \], apply a dead short or set calibrator to zero to input terminals 4 and 5. Wait 10 seconds, then press \[ \text{PAR} \].
3. At \[ 0 \; \text{u} \], apply 50,000 mV input signal (with an accuracy of 0.01% or better) to input terminals 4 and 5. Wait 10 seconds, then press \[ \text{PAR} \].
4. Return to the Display Mode.
5. Continue with Ice Point Calibration.

ICE POINT Calibration
1. Remove all option cards or invalid results will occur.
2. The ambient temperature must be within 20°C to 30°C.
3. Connect a thermocouple (types T, E, J, K, or N only) with an accuracy of 1°C or better to the meter.
4. Verify the readout Display Offset is 0, Temperature Scale is °C, Display Resolution is 0.0, and the Input Range is set for the connected thermocouple.
5. Place the thermocouple in close thermal contact to a reference thermometer probe. (Use a reference thermometer with an accuracy of 0.25°C or better.) The two probes should be shielded from air movement and allowed sufficient time to equalize in temperature. (A calibration bath could be used in place of the thermometer.)
6. In the Normal Display mode, compare the readouts.
7. If a difference exists then continue with the calibration.
8. Enter Module 9, use the arrow keys to display \[ \text{LaDE} \; \text{4B} \] and press \[ \text{PAR} \]. Then choose \[ \text{ICE} \] and press \[ \text{PAR} \].
9. Calculate a new Ice Point value using: existing Ice Point value + (reference temperature - Display Mode reading). All values are based on °C.
10. Enter the new Ice Point value.
11. Return to the Display Mode and verify the input reading (with 0 Display Offset) is correct. If not correct repeat steps 8 through 10.

ANALOG OUTPUT CARD CALIBRATION
Before starting, verify that the precision voltmeter (voltage output) or current meter (current output) is connected and ready. Perform the following procedure:

1. Use the arrow keys to display \[ \text{LaDE} \; \text{4B} \] and press \[ \text{PAR} \].
2. Use the arrow keys to choose \[ \text{OUT} \] and press \[ \text{PAR} \].
3. Using the chart below, step through the five selections to be calibrated. At each prompt, use the DP63x00arrow keys to adjust the external meter display to match the selection being calibrated. When the external reading matches, or if this range is not being calibrated, press \[ \text{PAR} \].

<table>
<thead>
<tr>
<th>SELECTION</th>
<th>EXTERNAL METER</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>( Q ) D. ( R )</td>
<td>0.00</td>
<td>Adjust if necessary, press [ \text{PAR} ].</td>
</tr>
<tr>
<td>( Q ) D. ( R )</td>
<td>4.00</td>
<td>Adjust if necessary, press [ \text{PAR} ].</td>
</tr>
<tr>
<td>( 200 ; \text{D} ; \text{R} )</td>
<td>20.00</td>
<td>Adjust if necessary, press [ \text{PAR} ].</td>
</tr>
<tr>
<td>( 500 ; \text{D} ; \text{R} )</td>
<td>0.00</td>
<td>Adjust if necessary, press [ \text{PAR} ].</td>
</tr>
<tr>
<td>( 1000 ; \text{D} ; \text{R} )</td>
<td>10.00</td>
<td>Adjust if necessary, press [ \text{PAR} ].</td>
</tr>
</tbody>
</table>

4. When \[ \text{NO} \] appears remove the external meters and press \[ \text{PAR} \] twice.
TROUBLESHOOTING

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>REMEDIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO DISPLAY</td>
<td>CHECK: Power level, power connections</td>
</tr>
<tr>
<td>PROGRAM LOCKED-OUT</td>
<td>CHECK: Active (lock-out) user input ENTER: Security code requested</td>
</tr>
<tr>
<td>MAX, MIN, TOT LOCKED-OUT</td>
<td>CHECK: Module 3 programming</td>
</tr>
<tr>
<td>INCORRECT INPUT DISPLAY VALUE</td>
<td>CHECK: Module 1 programming, Input Range Jumper position, input connections, input signal level</td>
</tr>
<tr>
<td></td>
<td>Module 4 Display Offset is zero, press DSP for Input Display PERFORM: Module 9 Calibration (If the above does not correct the problem.)</td>
</tr>
<tr>
<td>&quot;OLOL&quot; in DISPLAY (SIGNAL HIGH)</td>
<td>CHECK: Module 1 programming, Input Range Jumper position, input connections, input signal level</td>
</tr>
<tr>
<td>&quot;ULUL&quot; in DISPLAY (SIGNAL LOW)</td>
<td>CHECK: Module 1 programming, Input Range Jumper position, input connections, input signal level</td>
</tr>
<tr>
<td>JITTERY DISPLAY</td>
<td>INCREASE: Module 1 filtering, rounding, input range CHECK: Wiring is per EMC installation guidelines</td>
</tr>
<tr>
<td>MODULES or PARAMETERS NOT ACCESSIBLE</td>
<td>CHECK: Corresponding plug-in card installation</td>
</tr>
<tr>
<td>ERROR CODE (Err 1-4)</td>
<td>PRESS: Reset KEY (If cannot clear contact factory.)</td>
</tr>
<tr>
<td>DISPLAY ZERO’S AT LEVELS BELOW 1% OF RANGE</td>
<td>PROGRAM: Module 4 as Hi-t: 0.0 LO-t: 3271.1 (to disable zero chop feature)</td>
</tr>
</tbody>
</table>

For further assistance, contact technical support at the appropriate company numbers listed.

PARAMETER VALUE CHART

<table>
<thead>
<tr>
<th>MODEL NUMBER ________</th>
<th>Meter# _____________</th>
<th>Security Code ____ ______</th>
</tr>
</thead>
</table>

1-INP Signal Input Parameters

<table>
<thead>
<tr>
<th>DISPLAY</th>
<th>PARAMETER</th>
<th>FACTORY SETTING</th>
<th>USER SETTING</th>
<th>DISPLAY</th>
<th>PARAMETER</th>
<th>FACTORY SETTING</th>
<th>USER SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>rANGe</td>
<td>MODEL DEPENDENT</td>
<td>______________</td>
<td>____________</td>
<td>iNP 6</td>
<td>* INPUT VALUE 6</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>eYPE</td>
<td>DP63500: INPUT TYPE</td>
<td>e·J</td>
<td>____________</td>
<td>dSP 6</td>
<td>* DISPLAY VALUE 6</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>sCALE</td>
<td>DP63500: TEMPERATURE SCALE</td>
<td>of</td>
<td>____________</td>
<td>iNP 7</td>
<td>* INPUT VALUE 7</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>COuPL</td>
<td>DP63700: INPUT COUPLE</td>
<td>RC</td>
<td>____________</td>
<td>dSP 7</td>
<td>* DISPLAY VALUE 7</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>dECPt</td>
<td>* DISPLAY RESOLUTION</td>
<td>0</td>
<td>____________</td>
<td>iNP 8</td>
<td>* INPUT VALUE 8</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>round</td>
<td>DISPLAY Rounding INCREMENT</td>
<td>1</td>
<td>____________</td>
<td>dSP 8</td>
<td>* DISPLAY VALUE 8</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>OFFSt</td>
<td>DP63500: DISPLAY OFFSET</td>
<td>0</td>
<td>____________</td>
<td>iNP 9</td>
<td>* INPUT VALUE 9</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>FILtr</td>
<td>FILTER SETTING</td>
<td>0.5</td>
<td>____________</td>
<td>dSP 9</td>
<td>* DISPLAY VALUE 9</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>bAND</td>
<td>FILTER ENABLE BAND</td>
<td>10</td>
<td>____________</td>
<td>iNP 10</td>
<td>* INPUT VALUE 10</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>ICE</td>
<td>DP63500: ICE POINT SLOPE</td>
<td>0.000</td>
<td>____________</td>
<td>dSP 10</td>
<td>* DISPLAY VALUE 10</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>PlS</td>
<td>SCALING POINTS</td>
<td>2</td>
<td>____________</td>
<td>iNP 11</td>
<td>* INPUT VALUE 11</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>sTYLe</td>
<td>SCALING STYLE - NOT DP63500</td>
<td>KEY</td>
<td>____________</td>
<td>dSP 11</td>
<td>* DISPLAY VALUE 11</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>iNP 1</td>
<td>* INPUT VALUE 1</td>
<td>______________</td>
<td>____________</td>
<td>iNP 12</td>
<td>* INPUT VALUE 12</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>dSP 1</td>
<td>* DISPLAY VALUE 1</td>
<td>______________</td>
<td>____________</td>
<td>iNP 13</td>
<td>* INPUT VALUE 13</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>iNP 2</td>
<td>* INPUT VALUE 2</td>
<td>______________</td>
<td>____________</td>
<td>dSP 13</td>
<td>* DISPLAY VALUE 13</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>dSP 2</td>
<td>* DISPLAY VALUE 2</td>
<td>______________</td>
<td>____________</td>
<td>iNP 14</td>
<td>* INPUT VALUE 14</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>iNP 3</td>
<td>* INPUT VALUE 3</td>
<td>______________</td>
<td>____________</td>
<td>dSP 14</td>
<td>* DISPLAY VALUE 14</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>dSP 3</td>
<td>* DISPLAY VALUE 3</td>
<td>______________</td>
<td>____________</td>
<td>iNP 15</td>
<td>* INPUT VALUE 15</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>iNP 4</td>
<td>* INPUT VALUE 4</td>
<td>______________</td>
<td>____________</td>
<td>dSP 15</td>
<td>* DISPLAY VALUE 15</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>dSP 4</td>
<td>* DISPLAY VALUE 4</td>
<td>______________</td>
<td>____________</td>
<td>iNP 16</td>
<td>* INPUT VALUE 16</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>iNP 5</td>
<td>* INPUT VALUE 5</td>
<td>______________</td>
<td>____________</td>
<td>dSP 16</td>
<td>* DISPLAY VALUE 16</td>
<td>______________</td>
<td>____________</td>
</tr>
<tr>
<td>dSP 5</td>
<td>* DISPLAY VALUE 5</td>
<td>______________</td>
<td>____________</td>
<td></td>
<td></td>
<td>______________</td>
<td>____________</td>
</tr>
</tbody>
</table>

* Decimal point location is model and programming dependent.
### 2-FNC User Input and Function Key Parameters

<table>
<thead>
<tr>
<th>DISPLAY</th>
<th>PARAMETER</th>
<th>FACTORY SETTING</th>
<th>USER SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>USr-1</td>
<td>USER INPUT 1</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>USr-2</td>
<td>USER INPUT 2</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>USr-3</td>
<td>USER INPUT 3</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>F1</td>
<td>FUNCTION KEY 1</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td>FUNCTION KEY 2</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>rSt</td>
<td>RESET KEY</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>Sc-F1</td>
<td>2nd FUNCTION KEY 1</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>Sc-F2</td>
<td>2nd FUNCTION KEY 2</td>
<td>NO</td>
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</tbody>
</table>

### 3-LOC Display and Program Lockout Parameters

<table>
<thead>
<tr>
<th>DISPLAY</th>
<th>PARAMETER</th>
<th>FACTORY SETTING</th>
<th>USER SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>MAX DISPLAY LOCKOUT</td>
<td>LOC</td>
<td></td>
</tr>
<tr>
<td>L0</td>
<td>MIN DISPLAY LOCKOUT</td>
<td>LOC</td>
<td></td>
</tr>
<tr>
<td>bLoc</td>
<td>TOTAL DISPLAY LOCKOUT</td>
<td>LOC</td>
<td></td>
</tr>
<tr>
<td>SP-1</td>
<td>SETPOINT 1 ACCESS</td>
<td>LOC</td>
<td></td>
</tr>
<tr>
<td>SP-2</td>
<td>SETPOINT 2 ACCESS</td>
<td>LOC</td>
<td></td>
</tr>
<tr>
<td>SP-3</td>
<td>SETPOINT 3 ACCESS</td>
<td>LOC</td>
<td></td>
</tr>
<tr>
<td>SP-4</td>
<td>SETPOINT 4 ACCESS</td>
<td>LOC</td>
<td></td>
</tr>
<tr>
<td>CoDE</td>
<td>SECURITY CODE</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

### 4-SEC Secondary Function Parameters

<table>
<thead>
<tr>
<th>DISPLAY</th>
<th>PARAMETER</th>
<th>FACTORY SETTING</th>
<th>USER SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1-t</td>
<td>MAX CAPTURE DELAY TIME</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>L0-t</td>
<td>MIN CAPTURE DELAY TIME</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>dSP-t</td>
<td>DISPLAY UPDATE TIME</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Ra-t</td>
<td>DP63900: AUTO-ZERO DELAY</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Ra-b</td>
<td>DP63900: AUTO-ZERO BAND</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>b-LIt</td>
<td>UNITS LABEL BACKLIGHT - DP63500</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>OFFSt</td>
<td>DISPLAY OFFSET - NOT DP63500</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>ICE</td>
<td>DP63500: ICE POINT COMPENSATION</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

### 5-EB Totalizer (Integrator) Parameters

<table>
<thead>
<tr>
<th>DISPLAY</th>
<th>PARAMETER</th>
<th>FACTORY SETTING</th>
<th>USER SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>dECPt</td>
<td>TOTALIZER DECIMAL POINT</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>TbRSE</td>
<td>TOTALIZER TIME BASE</td>
<td>.1n</td>
<td></td>
</tr>
<tr>
<td>SCFCR</td>
<td>TOTALIZER SCALE FACTOR</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Locut</td>
<td>TOTALIZER LOW CUT VALUE</td>
<td>-19999</td>
<td></td>
</tr>
<tr>
<td>P-UP</td>
<td>TOTALIZER POWER-UP RESET</td>
<td>NO</td>
<td></td>
</tr>
</tbody>
</table>

### 7-5rL Serial Communication Parameters

<table>
<thead>
<tr>
<th>DISPLAY</th>
<th>PARAMETER</th>
<th>FACTORY SETTING</th>
<th>USER SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>bRud</td>
<td>BAUD RATE</td>
<td>9600</td>
<td></td>
</tr>
<tr>
<td>dRdR</td>
<td>DATA BIT</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>PRr</td>
<td>PARITY BIT</td>
<td>Odd</td>
<td></td>
</tr>
<tr>
<td>Addr</td>
<td>METER ADDRESS</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>ABrw</td>
<td>ABBREVIATED PRINTING</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>OPt</td>
<td>ENTER PRINT OPTIONS</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>GrO55</td>
<td>DP63900: PRINT GROSS OFFSET</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>GrO5E</td>
<td>DP63900: PRINT TARE OFFSET</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>inp</td>
<td>PRINT INPUT VALUE</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>tob</td>
<td>PRINT TOTAL VALUE</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>H 1/0</td>
<td>PRINT MAX &amp; MIN VALUES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>SPat</td>
<td>PRINT SETPOINT VALUES</td>
<td>NO</td>
<td></td>
</tr>
</tbody>
</table>

### 8-Out Analog Output Parameters

<table>
<thead>
<tr>
<th>DISPLAY</th>
<th>PARAMETER</th>
<th>FACTORY SETTING</th>
<th>USER SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>ANALOG TYPE</td>
<td>4-20</td>
<td></td>
</tr>
<tr>
<td>AS In</td>
<td>ANALOG ASSIGNMENT</td>
<td>INP</td>
<td></td>
</tr>
<tr>
<td>RA-LQ</td>
<td>ANALOG LOW SCALE VALUE</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>RA-HL</td>
<td>ANALOG HIGH SCALE VALUE</td>
<td>1000</td>
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</tr>
<tr>
<td>udp</td>
<td>ANALOG UPDATE TIME</td>
<td>0.0</td>
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<tr>
<td>burn</td>
<td>DP63500: PROBE BURN-OUT ACTION</td>
<td>LO</td>
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</tr>
</tbody>
</table>

### 9-FC5 Factory Setting Parameters

<table>
<thead>
<tr>
<th>DISPLAY</th>
<th>PARAMETER</th>
<th>FACTORY SETTING</th>
<th>USER SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>dLEu</td>
<td>DISPLAY INTENSITY LEVEL</td>
<td>3</td>
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### 6-SPt Setpoint (Alarm) Parameters

<table>
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<th>PARAMETER</th>
<th>FACTORY SETTING</th>
<th>USER SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACl-n</td>
<td>SETPOINT ACTION</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>SP-n</td>
<td>SETPOINT VALUE (main)</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>SP-n</td>
<td>SETPOINT VALUE (alternate)</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>HY5-n</td>
<td>SETPOINT HYSTERESIS</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>t0n-n</td>
<td>ON TIME DELAY</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>t0f-n</td>
<td>OFF TIME DELAY</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>out-n</td>
<td>OUTPUT LOGIC</td>
<td>nor</td>
<td></td>
</tr>
<tr>
<td>rSt-n</td>
<td>RESET ACTION</td>
<td>RuTo</td>
<td></td>
</tr>
<tr>
<td>Sb-n</td>
<td>STANDBY OPERATION</td>
<td>NO</td>
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</tr>
<tr>
<td>LIt-n</td>
<td>SETPOINT ANNUNCIATORS</td>
<td>nor</td>
<td></td>
</tr>
<tr>
<td>br-n</td>
<td>DP63500: PROBE BURN-OUT ACTION</td>
<td>OFF</td>
<td></td>
</tr>
</tbody>
</table>

† Select alternate list to program these values.

* Decimal point location is model and programming dependent.
### PART NUMBER INFORMATION

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3. Repair instructions and/or specific problems relative to the product.

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2. Model and serial number of the product, and
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OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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