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User's Guide

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DPF700-A
Analog Output Option Board
for the DPF700 Meter



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The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. 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, patient-connected applications.

This device is marked with the international caution symbol. It is important to read the Setup Guide before installing or commissioning this device as the guide contains important information relating to safety and EMC.



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PREFACE

MANUAL OBJECTIVES

This manual shows you how to install and use the Analog Output Option Board with the DPF700 meter.

In this manual we provide procedures for:

- * Installing the Analog Output Board
- * Setting up the Analog Output Board

Use this manual with your DPF700 manual (M1676)

NOTES and CAUTIONS

Information that is especially important to note is identified by these labels:

- **NOTE**
- **WARNING**
- **CAUTION**
- **IMPORTANT**



NOTE: provides you with information that is important to successfully setup and use the Programmable Digital Meter.



CAUTION or WARNING: tells you about the risk of electric shock.



CAUTION, WARNING or IMPORTANT: tells you of circumstances or practices that can effect the meter's functionality and must refer to accompanying documents

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INTRODUCTION

UNPACKING

Remove the Packing List and verify that all equipment has been received. If there are any questions about the shipment, use the phone number for the Customer Service Department nearest you.

Upon receipt of shipment, inspect the container and equipment for any signs of damage. Take particular note of any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

 **Note** *The carrier will not honor any claims unless all shipping material is saved for their examination. After examining and removing contents, save packing material and carton in the event reshipment is necessary.*

If you order a configured meter with options, you will receive the meter with option boards installed.

SAFETY CONSIDERATIONS



CAUTION: Do not expose this instrument to rain or moisture. Do not operate this instrument in flammable or explosive atmospheres. As with any electronic instrument, you may encounter high voltage exposure when calibrating or removing parts. Install the meter only when ac power is disconnected.

1.1 INSTALLING THE ANALOG OUTPUT BOARD

Install the analog output board as follows (refer to Figure 1-1):



CAUTION: The meter has no power-on switch, so it will be in operation as soon as you apply power.



IMPORTANT: Disconnect the power from the unit before installing this option board.

1. Hold the analog output card in a horizontal position, with the R37 and R38 potentiometers facing the back of the meter.
2. Line up the P6 connector on the interconnect board with the J6 pin on the main board. Push down to secure.
3. Line up the J8 pin on the analog output board with the P8 connector on the interconnect board. Push down to secure.

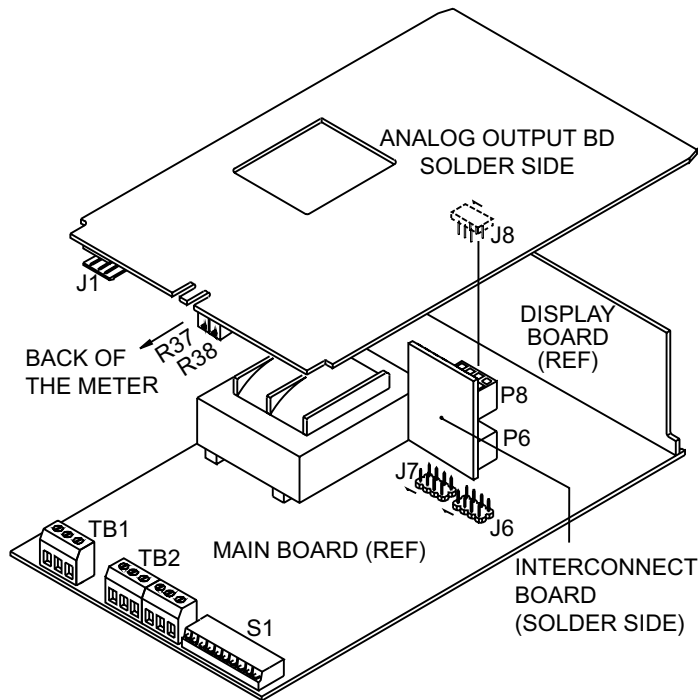


Figure 1-1. Installing the Analog Output Board

1.2 SETTING UP THE ANALOG OUTPUT BOARD

- * The display reading is in counts, disregarding the decimal point.
- * The output is in volt or milliamp.
- * The analog output may be used for proportional control applications, without integral or reset function.
- * "**A_n L₀**" and "**A_n H₁**" **values are write-only**. Values cannot be displayed once they are stored. Display will show "000000." even through values are stored.

Coarse adjust the analog output board as follows:

Note

Refer to Table 6-1 in the Main Operators manual for summary list of menu configuration.

1. Set the left digit in configuration to 0 for 4-20 mA (0XXXXX) or to 1 for 0-10 V (1XXXXX).
2. Access "**A_n L₀**" menu item. Enter display value which will give you 4 milliamps (0 volts).
3. Access "**A_n H₁**" menu item. Enter display value which will give you 20 milliamps (10 volts).
4. Save in either volatile or nonvolatile memory.

1.2 SETTING UP THE ANALOG OUTPUT BOARD (Continued)

Once you have performed coarse adjustment, proceed to fine adjustment as follows:

5. Adjust the input to show a value equal to "An L0". Adjust R38 potentiometer at the back of the board (refer to Figure 1-1) for 4 milliamp output (0 volts).
6. Adjust the input to show a value equal to "An H1". Adjust R37 potentiometer at the back of the board for 20 milliamp output (10 volts).
7. Repeat fine adjustment as necessary.

An easy way to set the display to "An L0" and "An H1" is to put the meter in the totalizer mode and set the offset to "An L0" and "An H1" while there is no input.

Example 1:

0.00 - 1000.00 display counts to equal 4-20 mA analog output.

1. Set configuration = 0XXXXX
2. Enter "An L0" = 0000.00
3. Enter "An H1" = 1000.00
4. Adjust R38 potentiometer for 4 mA output, while display = 0.00
5. Adjust R37 potentiometer for 20 mA output, while display = 1000.00.

1.2 SETTING UP THE ANALOG OUTPUT BOARD (Continued)

Example 2:

5000 - 10000. display counts to equal 0 - 10 V analog output.

1. Set configuration = 1XXXXX
2. Enter "An L0" = 005000.
3. Enter "An H1" = 010000.
4. Adjust R38 potentiometer for 0 V output, while display = 5000.
5. Adjust R37 potentiometer for 10 V output, while display = 10000.

Example 3:

Using analog output as a proportional controller: 8000. - 7000. display counts to equal 4-20 mA analog output. When "An L0" is greater than "An H1", the analog output may be used for proportional control applications.

1. Set configuration = 0XXXXX
2. Enter "An L0" = 008000.
3. Enter "An H1" = 007000.
4. Adjust R38 potentiometer for 0 V output, while display = 8000.
5. Adjust R37 potentiometer for 10 V output, while display = 7000.

1.2 SETTING UP THE ANALOG OUTPUT BOARD (Continued)

Example 4:

Programming "An LO" and "An HI" for analog output ranges other than 0-10 V or 4-20 mA. For example, if require 0-5 V output for the display readings of 0 - 10,000:

1. Select 0 - 10 V range and enter "An LO" = 0
2. Enter "An HI" = 20,000.

Example 5:

To get 1-5 V output for 0 - 10,000 readings, enter the desired display for 0 V output as "An LO" per the formula below:

$$\text{Gain} = \frac{\text{Reading High} - \text{Reading Low}}{\text{Input High} - \text{Input Low}}$$

$$\text{Gain} = \frac{10,000 - 0}{5-1} = \frac{10,000 \text{ cts/V}}{4} = 2,500 \text{ cts/V}$$

$$\text{Output} = \text{Reading/Gain} + \text{Offset}$$

$$\text{Output} = \frac{\text{Reading} + 1}{2500}$$

Reading = -2,500 will cause 0 V output

Reading = 22,500 will cause 10 V output

$$\text{An LO} = 0$$

$$\text{An HI} = 22,500$$

1.3 ELECTRICAL CONNECTION and SPECIFICATIONS

The analog output board is available on the J1 connector.

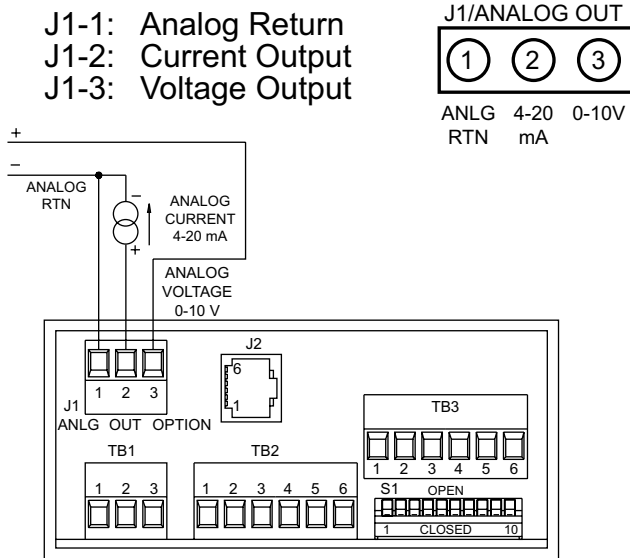


Figure 1-2. Electrical Wiring for Analog Output Connection

Maximum Load Impedance for Current Output: 500Ω
 Maximum Load for Voltage Output: 20 mA
 Total Current Output (pins 2 and 3 combined): 21 mA

Response Time

Total Mode: 80 mSec (99% of final value)
 Rate Mode: 360 mSec (99% of final value)

Note Response time in the Rate Mode can be reduced by changing the Gate Time, using RS-232 communication.

Minimum SPAN for 20 mA (10 V) output: 220 Counts

Maximum turn down ratio ($\frac{\text{An LO}}{\text{An HI} - \text{An LO}}$): 80

Resolution: 15 bits
 Accuracy, 0 - 10 V 99.8%
 Accuracy, 4 - 20 mA 99.75%







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If the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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2. Model and serial number of the product under warranty, and
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