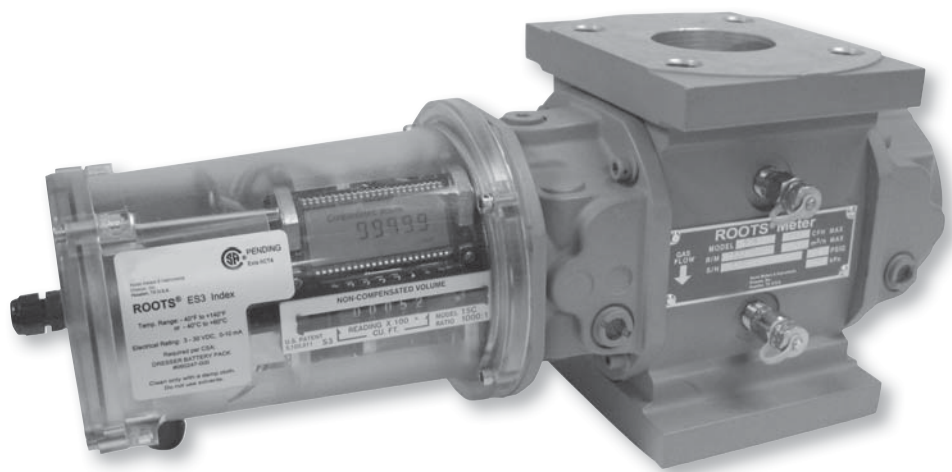


Dresser* Series B3 Meter with ES3 Electronic Temperature Compensator Circular Pulse Output Connector

Installation Supplement



ROOTS* ES3 Electronic Temperature Compensator (TC) Installation Procedures

Use and Limitations

This document provides recommendations where there is no established company procedure or practice.

WARNING

This equipment is designed to operate at temperatures between -40° F to 140° F. Prior to going on-site for installation or maintenance, make sure proper safety equipment is worn before handling the equipment and that you are properly dressed for the work site environment temperatures.

Safety

The purchaser and user of this product is warned that compliance with the manufacturer's instructions and procedures is required in order to avoid the hazards of leaking gas resulting from improper installation, start-up or use of this product. The user is responsible to comply with all federal, state and local building and safety regulations. The manufacturer recommends that a qualified technician install this product for safe and proper operation.

Refer to "Installation Operation and Maintenance: ES3" (IOM) for complete instructions. Consult Factory to obtain the IOM.

Receiving, Handling and Storage

Although of very rugged construction, reasonable care should be taken during handling and storage.

At Time of Delivery

1. Check the packing list to account for all items received
2. Inspect each item for damage
3. Record any visible damage or shortages on the delivery record
 - a. File a claim with the carrier if necessary
 - b. Notify your Roots Meter supplier immediately

IMPORTANT NOTE

Do not attempt repairs or adjustments, as doing so may be a basis for voiding all claims for warranty.

The ES3 Electronic TC does not require lubrication.

1. Meter Installation

Refer to "Installation Supplement IS:B3" for Meter installation procedures.

WARNING

If equipment is installed/serviced/maintained at elevated heights, ensure proper safe site work practices are in place to prevent fall and drop hazards.

WARNING

For installations in confined spaces, allow adequate room to safely handle product and equipment without causing bodily strain. Also verify proper ventilation is in place to maintain a breathable atmosphere.

2. LCD Display

Scrolling through the screen displays and connecting to the ES3 Electronic TC requires use of the magnet. The magnet can be purchased as part of the Communications Kit, P/N 060542-000 or as an individual item, P/N 060541-000. Consult Factory for pricing.

Swipe the magnet across the words "Roots ES3 Index" as shown in Figures 1 - 2.

Note: the magnet will not change screen displays if swiped on another area of the label.



Figure 1 - Label on ES3 Electronic TC



Figure 2 - Swipe magnet across the words "Roots ES3 Index" to change the screen displays

2.1 LCD Screen Displays

1. The default screen is either Compensated Volume or Non-Compensated Volume, depending on customer configuration.
 - a. This parameter is the home/default screen.
 - b. After a time out of approximately 30 seconds, the home screen always will appear.
2. Repeat the swiping motion of the magnet across the words "Roots ES3 Index," and the screens will appear in sequential order as shown in Table 1.

Note: Using the Dresser MeterWare Software, the screens are configured by checking and un-checking the parameter to be displayed. Depending on the ES3 configuration, some screens may not appear.

Table 1 - Scrolling sequence for ES3 screen display

Displayed on Screen	Represents	Function
COMPENSATED VOLUME	Compensated Volume	Displays non-compensated volume which has been corrected to standard conditions
NON-COMPENSATED VOLUME	Non-compensated Volume	Displays actual non-compensated volume
LINETEMP	Line Temperature	Displays live line temperature
FIXED P	Fixed Line Temperature	Displays the line pressure as entered by the user
FLOWRATE	Flow Rate	Displays uncorrected flow rate (average of latest 30 seconds of captured data)
MTR INFO	Meter Info	Meter size and type
PROVE CV	Compensated Prove Mode	Allows for compensated volume accuracy testing
PROVE UV	Non-compensated Prove Mode	Allows for non-compensated volume accuracy testing
BATTVOLT	Battery Voltage	Displays battery voltage
REM LIFE	Remaining Life	Calculated remaining battery life - shown in months
FIRM REV	Firmware Revisions	Displays the firmware revision that is in the ES3 at the present time
LCD TEST	LCD Test	Tests all display segments
BATTCHNG	Change Battery	Saves data to memory and resets clock
COMPFCTR	Compensation Factor	Displays the factor applied to non-compensated volume in order to arrive at compensated volume
COMPENSATED RESIDUAL	Compensated Residual	Shows extended compensated volume data beyond the value shown in the compensated volume screen
NON-COMPENSATED RESIDUAL	Non-compensated Residual	Shows extended non-compensated volume data beyond the value shown in the non-compensated volume screen
BASE T	Base Temperature	Displays base temperature as entered by the user
BASE P	Base Pressure	Displays base pressure as entered by the user
ATMOS	Atmospheric	Displays average atmospheric pressure as entered by the user
NCVOLFLT	Non-compensated volume under fault	Displays non-compensated volume that has accumulated since a fault occurred

- Three to five seconds after the name of the value or the parameter appears, the screen will switch to show you the value of the selected parameter.
- For an explanation of the data displays, refer to Section 2 of the "IOM:ES3 Installation Operation and Maintenance" manual. Consult Factory for a copy of the manual.

3. RPM Wheel

A high-speed RPM wheel is visible to the left of the digital display as shown in Figure 3.

The RPM wheel is tied directly to the meter impellers and is used to verify gas flow through the meter.

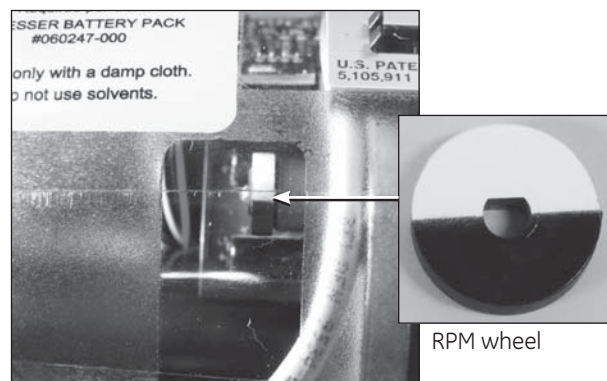


Figure 3 - Movement of the RPM wheel indicates impeller rotation

4. Wiring the Pulse Outputs

See Table 2 and Figure 4 for output pulse wiring for a Circular Connector.

WARNING

Ensure properly licensed/trained professionals are used to install equipment if installed in hazardous locations containing explosive atmospheres. All local codes and standards shall be maintained during installation.

WARNING

Products certified as intrinsically safe installations shall be:

- Installed, put into service, used and maintained in compliance with national and local regulations and in accordance with the recommendations contained in the relevant standards concerning potentially explosive atmospheres.
- Used only in situations complying with the certification conditions shown in this document and after verification of their compatibility with the zone of intended use and the permitted maximum ambient temperature.
- Installed, put into service and maintained by qualified and competent professionals who have undergone suitable training for instrumentation used in areas with potentially explosive atmospheres.

NOTE:

The Circular mating connector is available with 5, 10 or 20 feet of cable. Contact Factory for price, part number and availability.

To maintain compliance with CSA certification, use a suitable Intrinsic Safety barrier for a Class 1 hazardous area for groups A, B, C and D:

1. Do not exceed the following input values for the barrier device:
 - a. $V_i=8.2V$
 - b. $I_i=1.5ma$
2. The OUTPUT and power handling capability of a barrier should not exceed:
 - a. $V_{out}=30V$
 - b. $I_{out}=50ma$

Refer to Figure 5 for proper wiring in hazardous locations.

Table 2 - Circular Connector Wiring

Output	Name	Connector Pin	Pulse Type
Pulse Output 1 (+)	PO1 (+)	A	Form A
Pulse Output 1 (-)	PO1 (-)	B	
Drain	(Drain)	C	—
Pulse Output 2 (+)	PO2 (+)	D	Form A
Pulse Output 2 (-)	PO2 (-)	E	

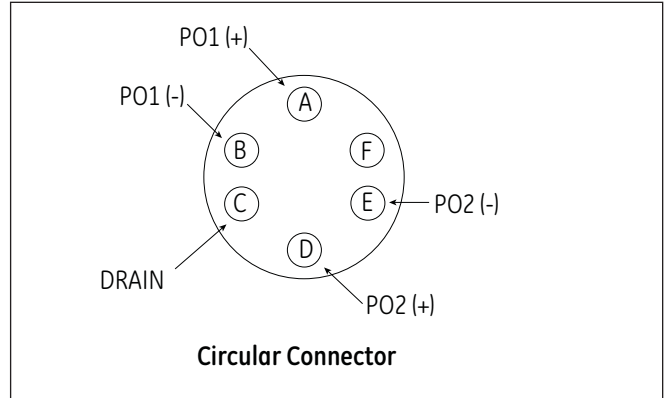


Figure 4 - Circular Connector Wiring

HAZARDOUS AREA

NON HAZARDOUS AREA

Use TURCK IM1-12Ex-T single channel, IM1-22 EX-R Dual channel Isolation Amplifiers or equivalent which are capable of high speed switching response.

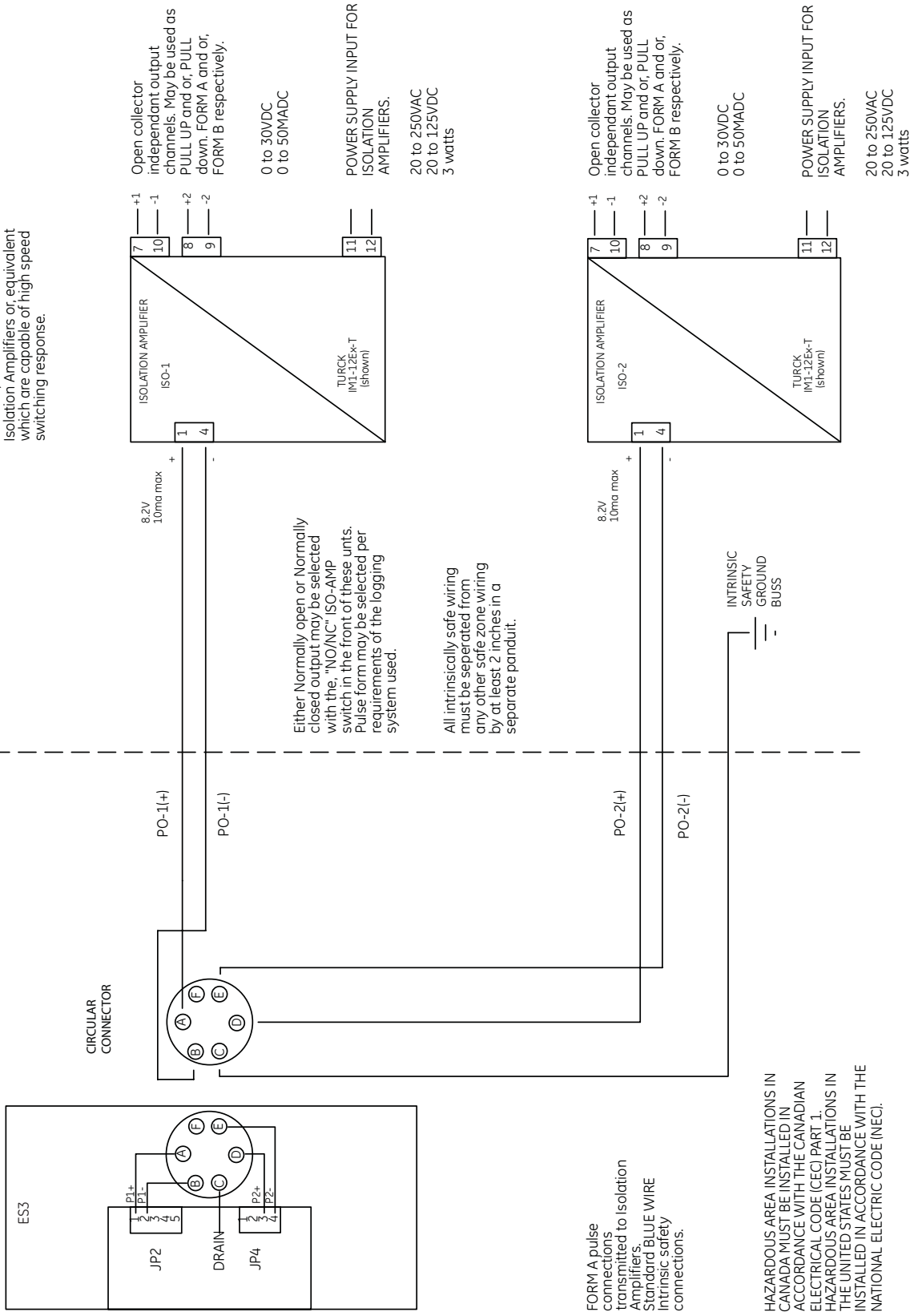


Figure 5 - Wiring Diagram for hazardous locations.

5. Pulse Output Verification

Using the Dresser MeterWare software, the Corrector pulse output allocation is configured in the Volume Configuration screen, as shown in Figure 6. Refer to this screen to verify proper configuration. Refer to the MeterWare Manual for complete operating instructions.

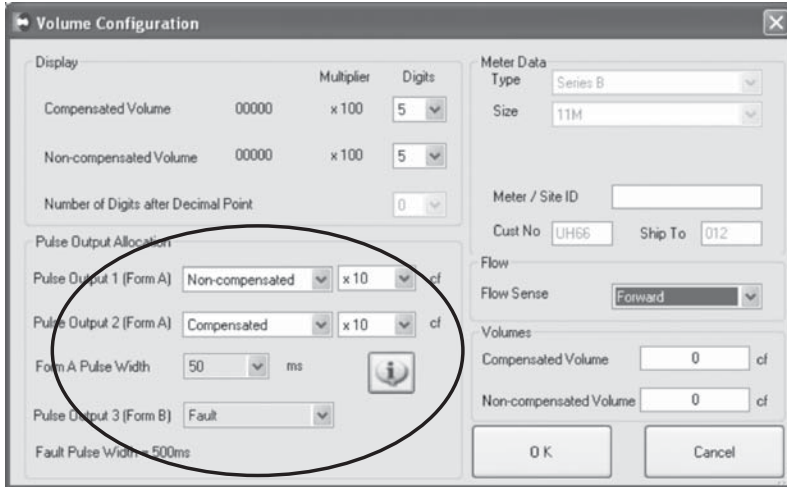


Figure 6 - Volume Configuration screen in Dresser MeterWare software

To ensure pulse outputs are properly wired, the Dresser MeterWare software has a test function available on the Advanced screen, as shown in Figure 7.

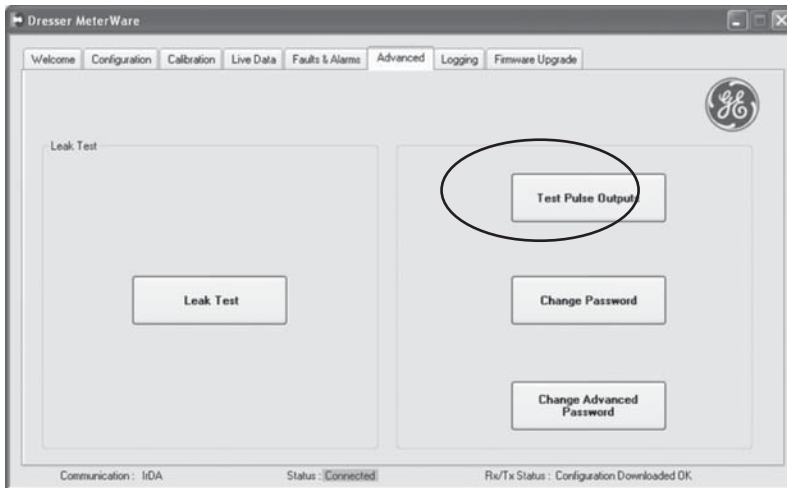


Figure 7 - Advanced screen in Dresser MeterWare software

After clicking "Test Pulse Outputs," a screen appears as shown in Figure 8. Click "Yes" to proceed with the pulse output test. For further information, refer to the Dresser MeterWare Manual.



Figure 8- Send test Pulses screen in Dresser MeterWare software

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