Instructions



15J755 Sensor Circuit Option

311603 rev.A

To upgrade E-Flo[™] Plus Electric Circulation Pumps to include the sensor circuit option.



Important Safety Instructions

Read all warnings and instructions in this manual and in E-Flo Plus Repair-Parts manual 311594. Save these instructions.

> E-Flo Plus Pump with 15J755 Sensor Circuit Option installed.

The following hazardous location listings apply to the sensor circuit (item 25) only.

Circuit Assembly Intrinsic Safe Control										
APPROVED		PART NO. SER		IES SERIAL						
Conforms to EEx ib IIB T3 FM std 3600 &3610 FM 06 ATEX 0025X CAN/CSA 22.2 No 157-92 & No. 1010.1-92	Intrinsic Safe Input Parameters					İ				
for use in Class I Div 1 Group C & D T3 Hazardous locations C 0359 Intrinsically Safe (IS) System. Install per IS Control Drawing No. 288110. Class I, Division 1, Group C & D T3		TDC Circuit		Pressure Circuit		1				
	Ui	15 V		31.5 V		Ł				
		60 mA		33 mA		ł				
	Ci	220 nF		.036 uF		<u>ء</u>				
	Li	280 uH		.44 uH		9314				
Read Instruction Manual - Warning: Substitution of components may impair intrinsic safety.	GRACO INC. P.O. Box 1441 Minneapolis, MN GRACO 55440 U.S.A.									
MIN / MAX TEMP RANGE: 0° - 50°C (32° - 122°F)										



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Pressure Relief Procedure



System pressure can cause the pump to cycle unexpectedly, which could result in serious injury from splashing or moving parts.

- 1. Set START/STOP switch to STOP.
- 2. Push in SECURE DISABLE switch.
- 3. Open the back pressure regulator and all fluid drain valves in the system, having a waste container ready to catch drainage. Leave open until you are ready to pressurize system again.
- Check that pressure gauges on fluid supply and return lines read zero. If gauges do not read zero, determine cause and carefully relieve pressure by VERY SLOWLY loosening a fitting. Clear obstruction before pressurizing system again.

Kit Parts

Sensor Circuit Kit 15J755 includes all parts to add the optional sensor circuit to a pump. Parts included in the kit are marked with an asterisk, for example (12*). Use all the new parts in the kit.

Ref.			
No.	Part No.	Description	Qty
12*	116719	SCREW, 8-32 hex washer head	12
25	n/a	SENSOR CIRCUIT; includes items	1
		25a-25c	
25a*	n/a	PRESSURE TRANSDUCER	1
25b*	n/a	TDC SENSOR	1
25c*	n/a	CIRCUIT BOARD	1
33*	n/a	GASKET, circuit board	1
34*	n/a	COVER, circuit board	1
35*	n/a	CONNECTOR, strain relief, 45°	1
36*	n/a	LABEL, calibration	1
41*	111316	O-RING; chemically resistant fluo-	1
		roelastomer	
42*	n/a	ADAPTER, transducer	1
43*	n/a	NUT, transducer	1
44*	n/a	CONDUIT, transducer	1
58*	n/a	SPACER; brass	1

Parts designated n/a are not available separately.

Kit Installation

<u>1</u>			

- 1. Jog the motor to bring the stand side lower to the bottom of its stroke.
- 2. Relieve pressure, page 2.
- 3. Shut off electrical power to the unit.
- 4. See FIG. 1. Remove two screws (12) and the cover (A).



FIG. 1. Remove Cover

- 5. See FIG. 3, page 4. Apply medium strength thread lock to the 45° connector (35*). Install the connector (35*), nut (43*), and conduit (44*) in the gear housing, oriented as shown.
- Unscrew the plug from the gear housing cavity (C) and clean old sealant from the housing. Apply pipe sealant and screw the TDC sensor (25b*) into the gear housing. Torque to 66-78 in-lb (7.4-8.8 N•m).

TDC sensor nuts are locked in place to ensure correct positioning. Do not adjust.

- Install the circuit board (25c*) using four screws (12*).
- 8. Connect the TDC cable (25b*) to J2 on the circuit board (25c*).
- Connect the IS circuit field wire to J2 and J3. See the Electrical Schematic in the E-Flo Plus Repair-Parts Manual 311594.
- See FIG. 2. Install one new black o-ring (41*) and the new brass spacer (58*) on the transducer (25a*).
- Thread the transducer's cable (25a*) through the adapter (42*) and conduit (44*). Connect the cable to J1 on the circuit board (25c*). See FIG. 3.
- See FIG. 2. At the pump outlet manifold (D), remove the plug. Insert the transducer into the outlet manifold (D). Torque the adapter (F) first, then the nut (E) to 15-20 ft-lb (21-27 N•m).
- 13. See FIG. 3, page 4. Install the new gasket (33*), the cover (34*), and six screws (12*).
- 14. Attach the label (36*) to the cover (34*).
- 15. Enter calibration information found on the label (36*) into the VFD. See **Pressure Sensor Calibration** Information.
- See Fig. 1. Reinstall the cover (A) with two screws (12*).

A Torque to 15-20 ft-lb (21-27 N•m).



FIG. 2. Pressure Transducer

Pressure Sensor Calibration Information

Pressure sensor information (Pr 20.34, 20.35, and 20.36) for your system must be keyed into the Variable Frequency Drive before system start-up.

To prevent accidental change of pressure sensor calibration parameters, they are locked by Pr **20.16**. To enter calibration parameters, perform the following steps:

- a. Set Pr **20.16** to 777, to unlock pressure sensor parameters.
- b. Enter calibration parameters Pr 20.34, 20.35, and 20.36.
- c. Set Pr **20.16** to 0 to lock pressure sensor parameters.

Calibration Parameters from the label:

Pr 20.34 – Zero Calibration

- Pr 20.35 Calibration Pressure
- Pr 20.36 High Calibration



FIG. 3. Circuit Board Connections

Pressure Transducer Calibration Procedure

E-Flo Plus pressure sensor must be calibrated against an instrument grade High Precision Pressure Transducer, which should be installed near the E-Flo Plus pressure sensor.

- 1. Ensure that the High Precision Pressure Transducer calibration is up to date.
- 2. Set Pr **20.11** to 777, to unlock pressure sensor parameters.
- 3. Calibrate Low Pressure Point as follows:
 - a. Ensure that system is not pressurized. Calibration instrument pressure reading should be 0 psi.
 - Use Keypad to navigate to Pr 20.33; monitor its reading for 5 10 seconds to determine its average value. Make a record of it.
 - c. Navigate to Pr **20.34** and enter the recorded average value of Pr **20.33**.
- 4. Calibrate the High Pressure Point as follows:
 - a. Pressurize the system to 250 275 psi.



is rated to a pressure lower then 250 psi, use maximum allowable rated pressure. Refer to Operation Manual 311593.

- b. Keep the system pressurized and ensure that pressure does not fluctuate.
- c. Take a pressure reading from the calibration instrument and make a record of it.
- d. Navigate to Pr **20.35** and enter the recorded system pressure.
- e. Navigate to Pr 20.33; monitor its reading for 5-10 seconds to determine its average value. Make a record of it.
- f. Navigate to Pr **20.36** and enter the recorded value of Pr **20.33**.
- 5. Set Pr **20.11** to 0 to lock pressure sensor parameters.
- 6. Verify pressure calibration.
 - a. Relieve system pressure.
 - b. Navigate to Pr **20.31** and verify that its reading is within the range of 0-3 psi.
 - c. Pressurize the system to about 100 psi. Verify that reading of Pr 20.31 is within +/- 2.5 psi of the system pressure.
 - Pressurize system to about 250 psi. Verify that reading of Pr 20.31 is within +/- 2.5 psi of the system pressure.

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