User Manual

(TDS Reference Number T90 520)

CPR 3000 2 part Pressure Transmitter

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EUROGAUGE
... the level people

Declaration of Conformity

CPR3000 Two-Part Loop Powered Pressure Transmitter

This is to certify that the above named product fully complies with the requirements of the normative sections of the following harmonised European Standards.

EN 50081-1 : Electromagnetic Compatibility - Generic Emission Standard.
Part 1 : Residential, Commercial and Light Industry.

EN 50082-1 : Electromagnetic Compatibility - Generic Immunity Standard.
Part 1 : Residential, Commercial and Light Industry.

Signed :

(J Graham)

Position : Technical Manager
Date : 09/07/2001

This declaration applies to the following Part Numbers:

4049 12 0000 Standard Unit with 1" BSP Fitting and Stainless Steel Sensor Diaphragm.
4049 12 0001 Unit with 1" BSP Fitting and Hastelloy Sensor Diaphragm.

1. Application

The CPR3000 range of two-part loop-powered pressure transmitters is designed to give continuous indication of liquid levels in tanks. A 4-20mA output signal, proportional to the liquid level in the vessel, is provided which operates from a nominal 24 Volt DC supply. The transmitter section incorporates a 1" BSP thread which can be fitted either directly into the vessel or into an external stand pipe. The transmitter is connected to the control unit via a 1.5 meter vented cable.

2. Operation

2.1 The pressure transducer is an integrated silicon strain gauge bridge with no moving parts that can wear or produce errors under conditions of shock or vibration. When pressure is applied to the diaphragm, the low level resulting strain is sensed by the strain gauges which respond with a change in their resistance. The strain gauges are bonded directly to the transducer diaphragm and are temperature compensated. When a voltage is used to excite the bridge, a signal voltage is created across the bridge which is linear and proportional to the applied pressure.

2.2 Zero and Span Adjustment

The zero and span adjustment potentiometers can be accessed by removing the lid of the control unit. The zero adjustment potentiometer (VR2) is preset at the works for a standard 4mA output. This control should normally only require minor (if any) adjustment.
The span adjustment potentiometers (coarse and fine) are works-preset to give a 20mA output corresponding to the height of liquid head and specific gravity supplied to Afriso Eurogauge by the Customer at the time of order. The fine span control (VR1) will normally only require minor readjustment.
Please note that the CPR sensor is selected for the pressure range required.
If the height and specific gravity requirements have changed significantly, the unit should be returned to Afriso Eurogauge for recalibration and / or sensor replacement.

3. Transmitter Installation

3.1 The protective cap on the sensor should not be removed from the transmitter unit until immediately prior to installation. If for any reason the transmitter is returned to Afriso Eurogauge it must be fitted with the protective cap.

3.2 The transmitter can be screwed into any 1" BSP fitting either in the vessel or in an external stand pipe using the pin spanner provided (Part Number 9930 3001).

3.3 Hygienic Fitting with Welding Gland (Part Number 6712 00 068W).
Ensure that the O'Rings have been removed prior to welding the gland into the tank wall.

Note The glands are precision machined and must not be excessively heated during the welding process. Re-fit the O'Rings into the gland and then screw the transmitter into the gland using the pin spanner provided (Part Number 9930 3001).

3.4 Fit the control unit housing to a flat vertical surface, not more than 1.5 meters from the transmitter, with the Pg glands pointing downwards.

4. Wiring and Commissioning

Note: The transmitter and control unit are calibrated as a pair and must be used together. If a transmitter and control box from different pairs are connected together the system may not function correctly.

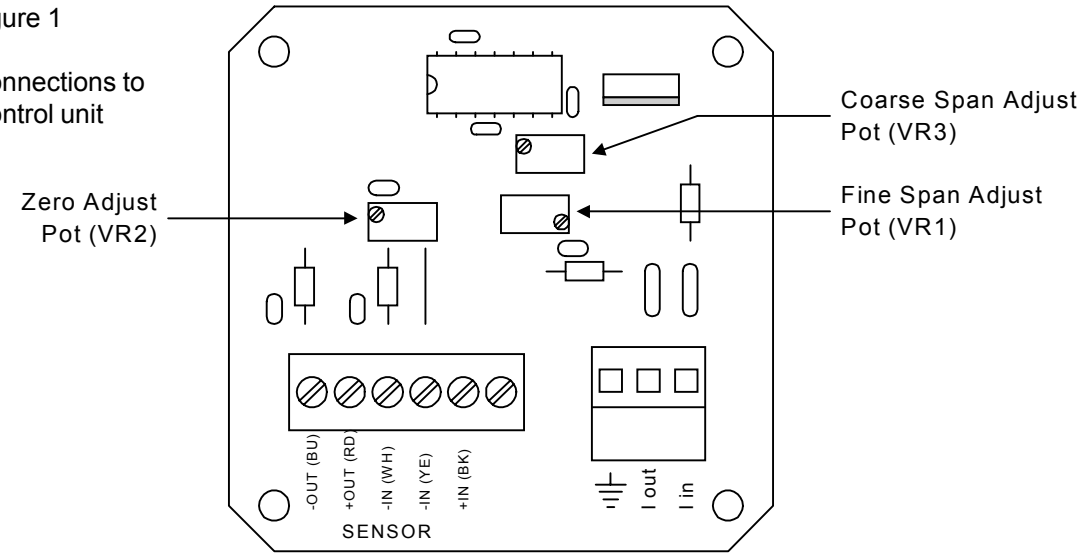
4.1 Wiring

Connect the 5 core vented cable from the transmitter to the sensor connnections in the control unit as follows (see figure 1 below):
Blue wire: -OUT; Red wire: +OUT; White wire: -IN (WH); Yellow wire: -IN (YE); Black Wire: +IN

Connect the control unit to the power supply (see wiring schematic on page 4). It is recommended that PVC covered 2-core 0.75mm^2 cable with a minimum o.d.of 6mm be used. If the cable is likely to be exposed to high levels of RFI, then screened cable should be used with the screen being connected to ground at the power supply end.

figure 1

connections to control unit



4.2 Commissioning

The transmitter and control unit are calibrated by Afriso Eurogauge to customer requirements prior to despatch, and the zero and span should therefore only require minor adjustments. It should not be necessary to adjust the coarse span control unless the vessel dimensions have been altered.

To commission the unit proceed as follows:

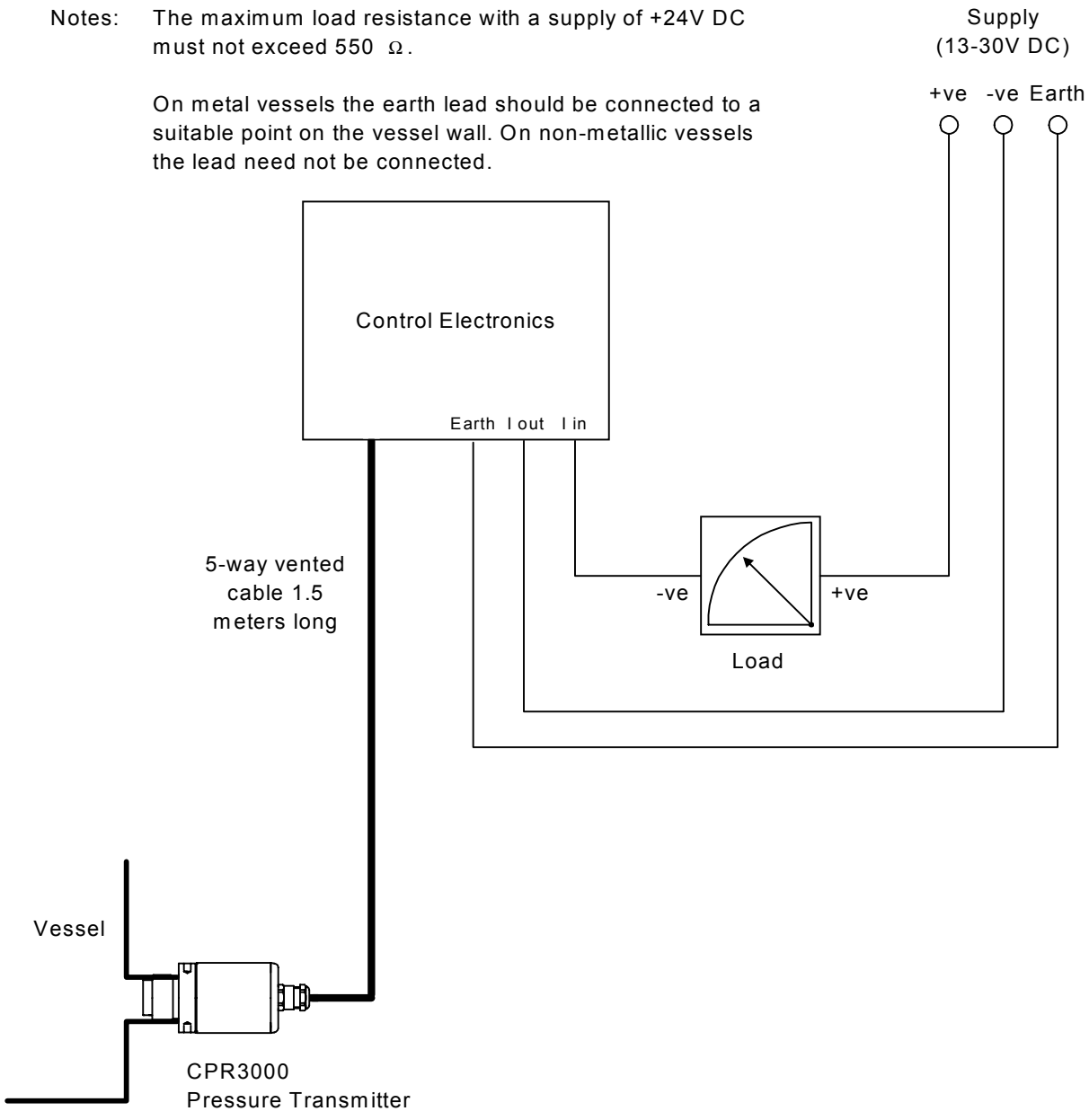
With the vessel empty re-adjust the zero potentiometer VR2 to give a reading of 4mA.
With the vessel full check that the reading is in the range 19.5 to 20.5mA.
If the reading is outside this range, adjust the coarse span potentiometer (VR3) to give a reading in the range 19.5 to 20.5mA.
Then re-adjust the fine span potentiometer (VR1) to give a reading of 20mA.

4.3 **Do not test the operation of the CPR3000 transmitter system by 'thumbing' the sensor face as this may cause permanent damage to the sensor!**

4.4 Wiring Schematic

Notes: The maximum load resistance with a supply of +24V DC must not exceed 550 Ω.

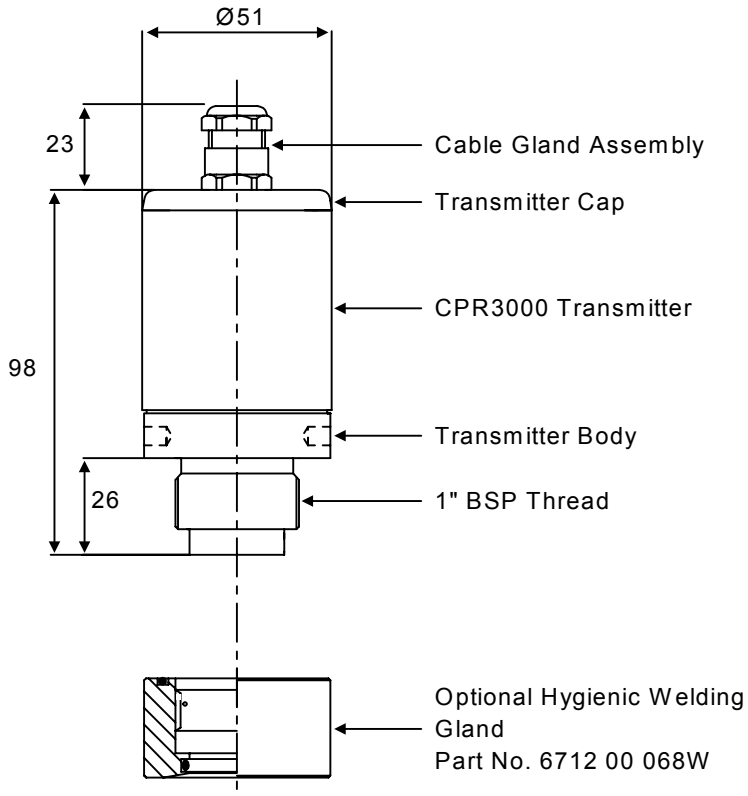
On metal vessels the earth lead should be connected to a suitable point on the vessel wall. On non-metallic vessels the lead need not be connected.



5. Specification

Ranges	200	0 - 3 m.w.g.	over-pressure 2.5 x rated pressure.
	500	0 - 7.5 m.w.g	over-pressure 2.5 x rated pressure.
	1000	0 - 15 m.w.g.	over-pressure 3 x rated pressure.
	2000	0 - 30 m.w.g.	over-pressure 4 x rated pressure.
Supply	13 - 30 Volts DC.		
Output	4-20mA.		
Load	Maximum Load Resistance =		(Supply Voltage - 13)/0.02.
	e.g.	At Vs = 15V	RL (max) = 100Ω.
		At Vs = 24V	RL (max) = 550Ω.
		At Vs = 30V	RL (max) = 850Ω.
Combined Linearity and Hysteresis	≤ ± 0.25% of Full Scale.		
Temp. Co-Efficient	≤ 0.05% / ºC (zero and span) at rated transducer pressure.		
Temperature	Transmitter Operating Range: -20ºC - 100ºC.		
	Over-temperature: 120ºC for 30 minutes.		
Transmitter Housing	Wetted Parts	Stainless Steel T316 S31.	
	Sleeve	Stainless Steel T303 - See note 1 below.	
Transmitter Top Cap	Glass reinforced ABS		
Transmitter Cable	Vented PVC covered 2-core : core size 0.75mm^2		
	Cable length 1.5 meters.		
Transmitter Dimensions	Length 121mm (including Pg9 cable gland), Diameter 51mm.		
Control Unit Housing	Polycarbonate:	94mm x 94mm x 58.5mm	
	Fixing Holes:	79mm x 79mm x 5mm dia.	
Cable Entries	Transmitter Pg9; Control Unit: 2 off Pg11.		
Protection	Transmitter: IP67; Control Unit: IP66.		
Weights	Transmitter: 0.75kg; Control Unit: 0.25kg.		
Note 1 :	Other materials available on request.		

6. Transmitter Outline and Dimensions



7. Control Unit Outline and Dimensions