

## **GEMS SENSORS & CONTROLS**

### **OPERATING & INSTALLATION INSTRUCTIONS 31XX / 32XX SERIES**

**PLEASE READ CAREFULLY BEFORE INSTALLING**

**Part Number:** 560550-0076

**Issue:** D

## **INTRODUCTION**

Series 3100/3200 high output pressure transducers and transmitters are fitted with an Asic providing various optional (at time of order) voltage outputs, and a 4-20mA current output capable of being used in control and indicating loops without further amplification.

Series 3100/3200 with the CE Mark conform to the essential protection requirements of the EMC Directive 89/33/EEC certified by type testing to EN50082-2 & EN50081-1.

Series 3100/3200 with the CE0086 mark also complies with the requirements of the Pressure Equipment regulations 1999 and is classed as a safety accessory and can be used as a safety-related device on Category IV pressure equipment. No other product should be used a "Safety Accessories" as defined by the PED Article 1, Paragraph 2.1.3.

## **HAZARDOUS PRODUCTS**

The Consumer Protection Act of 1987, Section 6 of the Health and Safety at Work Act 1974 and the Control of Substances Hazardous to Health Regulations 1988 require that we advise recipients and users of our products of any potential hazards associated with their storage, handling or use.

The products which our Company supplies may be classified as Electrical, Electro-Mechanical and Electronic equipment.

These products are tested and supplied in accordance with our published specifications or individual special requirements that are agreed in writing at time of order. They are constructed so as not to affect adversely the safety of persons and property when properly installed, maintained and used by qualified personnel, in the applications for which they were designed and manufactured.

**Conformity with the requirements of the CE mark only applies when the installation conditions described in these instructions have been met. For units supplied without a cable assembly connection to the transducer must be accomplished using Gems Sensors approved cable. See APPROVED CABLE section.**

## **GENERAL**

- \* Transducer should not be subjected to greater than the maximum allowable pressure (P.S.)  
/ Temperature (T.S) as defined on the transducer label.
- \* Transducer should not be subjected to mechanical impact.
- \* In the event of fire the end user must ensure that the system pressure is vented to a safe area.

- \* The effects of decomposition of unstable fluids should be considered by the user when placing this device in service.
- \* The pressure transducer has no means of draining or venting, this must be performed by another component in the end users system.
- \* Pressure range must be compatible with the maximum pressure being measured.
- \* Pressure media must be compatible with the transducer/transmitter wetted parts listed in these instructions.
- \* Liquid must not be allowed to freeze in the pressure port.
- \* The gasket must be fitted under the electrical connector.

### **MECHANICAL INSTALLATION**

**Mounting:** Pressure Transducer is designed to be attached by the coupling thread only. Omni-directional, self supported directly into the pipework. The Customer must ensure that the pressure seal is suitable for the application. If in doubt contact Gems Sensors & Controls. Observe the following maximum torques when tightening. Tightening / removal torque must be applied to pressure port hexagon only, with electrical supply disconnected.

<b>PRESSURE PORT THREAD TYPE</b>	<b>MAX TORQUE NM OR TIGHTENING INSTRUCTION</b>
G1/4”A	35
G1/8”A	25
M12	30
M12 HP (Washer Seal)	35
M14	40
M18	35
5/16”-24UN ‘O’ Ring	10
7/16”-20UN ‘O’ Ring	20
7/16”-20UN Flare	16
9/16”-18UN Flare	28
NPT or NPTF	2 to 2.5 FFFT (Flats from Finger Tight) 120 to 150 degrees

### **ELECTRICAL INSTALLATION**

All types with the CE Mark include suppression devices providing transient protection to EN 61000-6-2 and EN 55022. Refer to Tables 1 and 2 for electrical connections. Supply voltages are shown in Table 3.

### **RECOMMENDED CABLE**

Gems Sensors & Controls uses cables comprising 2, 3 or 4 colour-coded cores, enclosed by either a braided screen or aluminised polyester screen where the screen is in intimate contact with a separate drain wire. Cable materials must compatible with the operating temperature.

## **OPERATION**

Having installed the transducers as instructed, they are ready for use. The transducer should not be removed whilst the system is at pressure. Before applying power, check that the correct polarity and excitation levels are being applied. See Tables 1 & 2 for electrical connections.

## **CALIBRATION**

Transducers are calibrated to the datum requested at time of order; this can be identified by the sixth letter of the identification code as follows:-

- G - Gauge datum vented to atmosphere via the electrical connector or cable
- S - Sealed Datum

## **LOAD CHARACTERISTICS** (4-20mA Current Output)

The total resistive load in the loop (to include all the cable resistance) can be from 'zero to 50 x (supply volts -7.5) ohms' e.g. with a 24V d.c. supply the permissible load is from zero up to 700 ohms.

## **OPERATIONAL LIFE:**

Limited to 100M cycles to maximum allowable pressure.

## **WARRANTY**

We guarantee this instrument against faulty workmanship and material for a period of one year from date of delivery. The Company undertake to repair, free of charge, ex-works any instrument found to be defective within the specified period providing the instrument has been used within the specification in accordance with these instructions and has not been misused in any way.

Detailed notice of such defects and satisfactory proof thereof must be given to the Company immediately after the discovery and the goods are to be returned free of charge to the Company, carefully packed and accompanied by a detailed failure report. See "RETURN TO FACTORY".

## **WETTED PARTS**

17-4 PH stainless steel , 304 stainless steel & Viton (FKM Elastomer-Standard seal material)

## **SERVICING**

The transducer cannot be repaired locally and if damaged should be returned to ourselves at the address shown below or to accredited dealers when a replacement/repair is required:

Gems Sensors & Controls  
Lennox Road  
Basingstoke  
Hants. RG22 4AW

Gems Sensors Inc  
1 Cowles Road  
Plainville, CT 06062  
U.S.A.

## RETURN TO FACTORY

**PLEASE NOTE:** To comply with Health and Safety requirements, the instrument must be clean and safe to handle and accompanied by a formal statement to that effect duly signed by an authorised officer of the Company.

Any instrument returned without certification will be quarantined and no action will occur until cleared. It may ultimately be returned to you and subject to a transportation charge.

## MAINTENANCE

**Routine Inspection:** Not required except for periodic inspection of the cable and connector to ensure that these are neither damaged nor softened by incompatible liquid.

### ELECTRICAL CONNECTIONS

**Table 1**

TYPE NUMBER	CONNECTOR	4-20MA		VOLTAGE 3100			VOLTAGE 3101/3102/3103				UNCONDITIONED			
		IN+	IN-	IN+	COM	OUT+	IN+	COM	OUT+	TEMP OUT+	IN+	OUT+	IN-	OUT-
310X-6	Amp Superseal 1.5	3	2	3	2	1								
310X-8	Deutsch DT04	2	1	2	1	4	2	1	4	3				
310X-B	GDS 307	2	4	2	4	1	2	4	1	3				
310X-G	DIN 43650A	1	2	1	2	3								
310X-E	M12 Flying Lead	BR	BL	BR	BL	W	BR	BL	W	BK	BR	BL	BK	W
310X-7	DIN 72585 Bayonet	1	2	1	2	3	1	2	3	4				
310X-E	M12	1	3	1	3	2	1	3	2	4	1	3	4	2
310X-9	Packard Metripack	B	A	B	A	C								
310X-F	Integral Cable	BR	BL	BR	BL	W	BR	BL	W	BK				

**Table 2**

TYPE NUMBER	CONNECTOR	4-20MA		VOLTAGE 3200			VOLTAGE 3201/3102/3103				UNCONDITIONED			
		IN+	IN-	IN+	COM	OUT+	IN+	COM	OUT+	TEMP OUT+	IN+	OUT+	IN-	OUT-
320X-6	Amp Superseal 1.5	3	2	3	2	1								
320X-8	Deutsch DT04	2	1	2	1	4	2	1	4	3				
320X-B	GDS 307	2	4	2	4	1	2	4	1	3				
320X-G	DIN 43650A	1	2	1	2	3								
320X-E	M12 Flying Lead	BR	BL	BR	BL	W	BR	BL	W	BK	BR	BL	BK	W
320X-7	DIN 72585 Bayonet	1	2	1	2	3	1	2	3	4				
320X-E	M12	1	3	1	3	2	1	3	2	4	1	3	4	2
320X-9	Packard Metripack	B	A	B	A	C								
320X-F	Integral Cable	BR	BL	BR	BL	W	BR	BL	W	BK				

**Table 3**

OUTPUT	SUPPLY VOLTAGE
4-20mA	10V to 30V d.c. (24V d.c. maximum above 110°C)
1-6V	8V to 30V d.c.
0-10V	12V to 30V d.c.
0.5-4.5V	8V to 30V d.c. (non-ratiometric)
0.5-4.5V	5V d.c. ±10% (ratio-metric)
1-5V	8V to 30V d.c.
0-5V	8V to 30V d.c.