

IM/P871 Issue 4

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ABB Instrumentation



Health and Safety
To ensure that our products are safe and without risk to health, the following points must be noted:

- The relevant sections of these instructions must be read carefully before proceeding.
- Warning labels on containers and packages must be observed.
- Installation, operation, maintenance and servicing must only be carried out by suitably trained personnel and in accordance with the information given.
- Normal safety precautions must be taken to avoid the possibility of an accident occurring when operating in conditions of high pressure and/or temperature.
- Chemicals must be stored away from heat, protected from temperature extremes and powders kept dry. Normal safe handling procedures must be used.
- When disposing of chemicals ensure that no two chemicals are mixed.

Safety advice concerning the use of the equipment described in this manual or any relevant hazard data sheets (where applicable) may be obtained from the Company address on the back cover, together with servicing and spares.

Client Warranty
Prior to installation, the equipment referred to in this manual must be stored in a clean, dry environment, in accordance with the Company's published specification. Periodic checks must be made on the equipment's condition. In the event of a failure under warranty, the following documentation must be provided as substantiation:

- A listing evidencing process operation and alarm logs at time of failure.
- Copies of operating and maintenance records relating to the alleged faulty unit.

Information in this manual is intended only to assist our customers in the efficient operation of our equipment. Use of this manual for any other purpose is specifically prohibited and its contents are not to be reproduced in full or part without prior approval of Technical Communications Department, ABB Instrumentation Ltd.

Although **Warning** hazards are related to personal injury, and **Caution** hazards are associated with equipment or property damage, it must be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process system performance leading to personal injury or death. Therefore, comply fully with all **Warning** and **Caution** notices.

Note. Clarification of an instruction or additional information.

Information. Further reference for more detailed information or technical details.

Warning. An instruction that draws attention to the risk of injury or death.

Caution. An instruction that draws attention to the risk of damage to the product, process or surroundings.

Customer Support
ABB Instrumentation provides a comprehensive after sales service via a Worldwide Service Organization. Contact one of the following offices for details on your nearest Service and Repair Centre.

United Kingdom ABB Instrumentation Limited Tel: +44 (0)1480 475321 Fax: +44 (0)1480 470787	United States of America ABB Instrumentation Inc. Tel: +1 716 2926050 Fax: +1 716 2736207
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1 INTRODUCTION

Warning.

- The pressure range must be compatible with the maximum pressure being measured.
- The pressure media must be compatible with the transmitter wetted parts listed in these instructions.
- Liquid must not be allowed to freeze in the pressure port.
- Exposed ends of cables must be free from moisture.
- P881: the gasket must be fitted under the electrical connector.
- P871: the sensor breather tube must not be blocked.
- Wetted parts:
 P881 17 – 4 PH stainless steel plus Nickle Braze to BS1845 : NK3/HTN2.
 P871 17 – 4 PH stainless steel plus Nickle Braze to BS1845 : NK3/HTN2.
 316/321 Stainless steel body tube, polyurethane cable.

The **DATUM P871 and P881** Pressure Sensors are ideal for applications where a conventional transmitter is too expensive and over specified.

The **DATUM P881** is a low-cost simple transducer which, when used with the DATUM L150/L160 indicators, gives a complete stand-alone pressure indicator/transmitter solution.

The **DATUM P871** submersible sensor, with its IP68 integrity, is suitable for pressure measurement in adverse conditions or total immersion for the measurement of liquid level/depth.

Both types can be used as a primary sensor, utilizing one of ABB's other products, e.g. **COMMANDER 300 and 310** Universal Process Controllers.

2 MECHANICAL INSTALLATION

2.1 Pressure Connections

P871: G¹/₈ internal to BS 2779 compatible with ISO 228. Fitted with Nosecone.

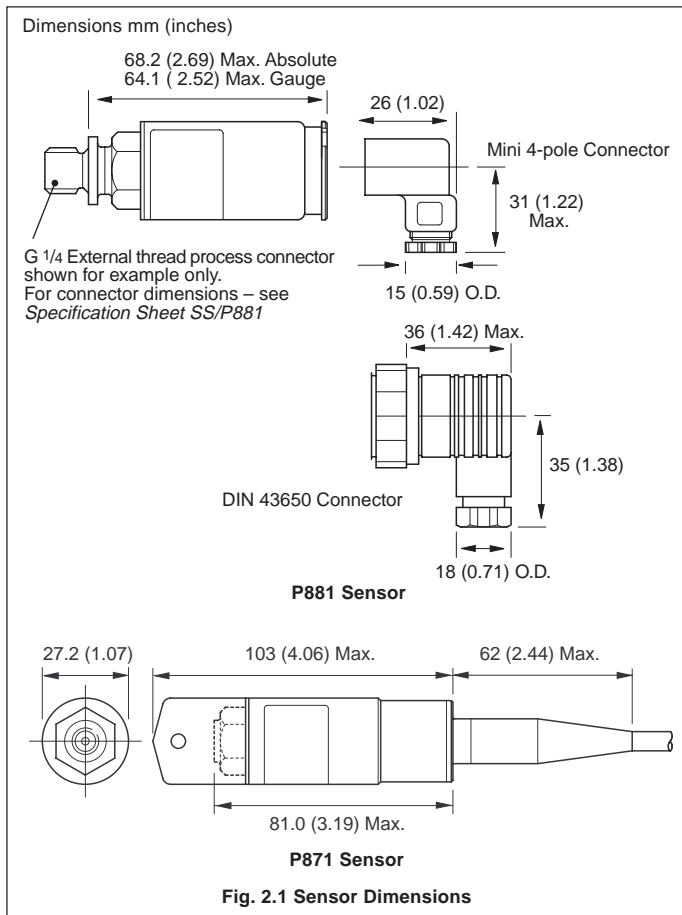
P881: G¹/₄ internal, G¹/₄ external, 1/4 – 18NPT external, G¹/₂A pressure gauge, 7/16 – 20UNF external, G¹/₄ ERMETO, 1/8 – 27NPT external, R¹/₄ external or G¹/₈ internal.

2.2 Environmental Limits

- Temperature limits: P871 –20°C to 55°C. P881 –40 °C to 125 °C.
- P871 rated to IP68

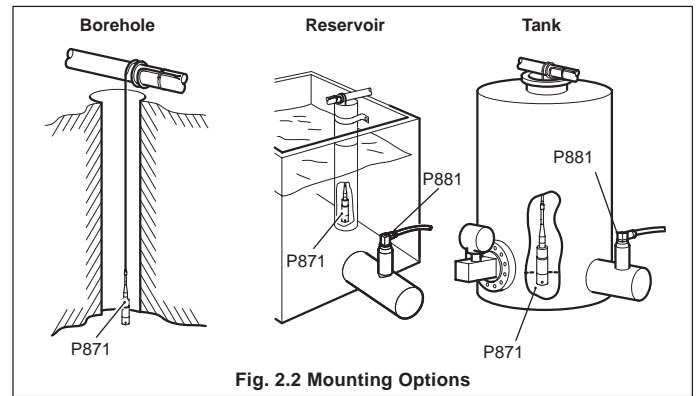
Caution. In high humidity environments, condensation must be prevented from entering the sensor vent (breather) tube.

2.3 Dimensions – Figs. 2.1



...2 MECHANICAL INSTALLATION

2.4 Mounting – Figs. 2.2



When mounting the P871, wrap the cable a minimum of two turns around a structural support (minimum bend radius 50mm (1.97 in.)) and secure using a suitable cable clamp. Avoid sharp edges which may damage or deform the cable.

3 ELECTRICAL INSTALLATION

Information. To reduce the effects of lightning strikes the sensors are fitted with suppression devices providing surge immunity to IEC 801 Part 5. It is recommended that the receiving equipment be fitted with a Lightning Protection Unit (LPU) at the point of cable entry into the building.

3.1 Electrical Connections

Electrical Connections	+ve	–ve	case earth
P871	Red	Blue	Green/braided screen
P881	Pin 1	Pin 2	Pin 4

Electrical Specifications	Rated	Min./Max.	Milliamps
P871	24V d.c.	7 to 35	4 to 20
P881			

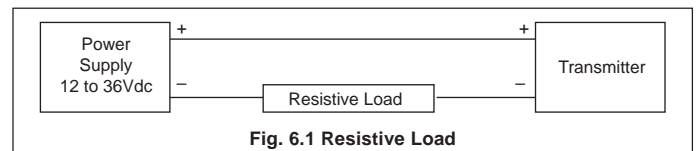
Table 3.1 Electrical Connections and Specifications

3.2 Grounding

All versions should be grounded by the installation pipework. If this is not possible, the sensor should be grounded at the instrumentation end via the appropriate pin or green lead. For maximum protection against RFI all versions should be installed using screened cable with the screen earthed at the instrumentation end.

3.3 Resistive Loading

The total permissible resistive load in the loop (to include all the cable resistance) can be from zero to 50 x (supply volts –7) ohms, eg. with a 24V d.c. supply the permissible load is from zero up to 850Ω, see Fig. 6.1.



3.4 Applying Power

Before applying power, ensure the correct polarity and excitation levels are applied.

3.5 Calibration

Transmitters are calibrated to a fixed range at time of order, identified by the identification code marked on the sensor housing – see specification sheets SS/P851 and SS/P881.

4 MAINTENANCE

4.1 Routine Inspection

Limited to periodic inspection of the cable and connector to ensure that these are neither damaged nor softened by incompatible liquid.

4.2 Repair

The instruments cannot be repaired locally. If damaged, return to the Company at the address shown on the back page, or to accredited dealers, if a replacement/repair is required.