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 273944

**United States of America**

ABB Instrumentation Inc.
Tel: +1 716 292 6050
Fax: +1 716 273 6207

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**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:

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

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**Health and Safety**

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

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

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**Use of Instructions**

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.

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**Terminology**

The safety and environmental hazard level is classified as:

- Category 1: Hazardous substances (hazard level 1)
- Category 2: Risk of fire and explosion (hazard level 2)
- Category 3: Hazardous property (hazard level 3)
- Category 4: Environmental hazard (hazard level 4)

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**Process of Instructions**

1. **Warning** - Information on equipment or product safety.
2. **Caution** - Information on environmental impact.
3. **Note** - Additional information on installation or operation.
4. **Information** - Further reference for technical details or user guidance.
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:
  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.

MECHANICAL INSTALLATION

2.1 Pressure Connections

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

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

Dimensions mm (inches)

<table>
<thead>
<tr>
<th>Part</th>
<th>Dimension</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1/4 External thread process connector shown for example only. For connector dimensions – see Specification Sheet SS/P881</td>
<td>36 (1.42) Max.</td>
<td></td>
</tr>
<tr>
<td>DIN 43650 Connector</td>
<td>35 (1.38) O.D.</td>
<td></td>
</tr>
<tr>
<td>Mini 4-pole Connector</td>
<td>31 (1.22) Max.</td>
<td></td>
</tr>
<tr>
<td>P881 Sensor</td>
<td>18 (0.71) O.D.</td>
<td></td>
</tr>
<tr>
<td>27.2 (1.07) Max.</td>
<td>103 (4.06) Max.</td>
<td></td>
</tr>
<tr>
<td>68.2 (2.69) Max.</td>
<td>64.1 (2.52) Max.</td>
<td></td>
</tr>
<tr>
<td>P871 Sensor</td>
<td>81.0 (3.19) Max.</td>
<td></td>
</tr>
</tbody>
</table>

ELECTRICAL INSTALLATION

3.1 Electrical Connections

<table>
<thead>
<tr>
<th>Electrical Connections</th>
<th>+ve</th>
<th>–ve</th>
<th>case earth</th>
</tr>
</thead>
<tbody>
<tr>
<td>P871</td>
<td>Red</td>
<td>Blue</td>
<td>Green/braided screen</td>
</tr>
<tr>
<td>P881</td>
<td>Pin 1</td>
<td>Pin 2</td>
<td>Pin 4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical Specifications</th>
<th>Rated</th>
<th>Min./Max.</th>
<th>Milliamps</th>
</tr>
</thead>
<tbody>
<tr>
<td>P871</td>
<td>24V d.c.</td>
<td>7 to 35</td>
<td>4 to 20</td>
</tr>
<tr>
<td>P881</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

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.