

# EST-4 Series

## Smart Pressure Transmitter



With EST4300 Pressure Transmitter, you may better control your plant. You will be able to reduce product variation and complexity as well as your total cost of ownership by leveraging one device across a number of pressure, liquid level and flow application. You will access information for diagnose, correct and even prevent errors. EST4300 provides you unparalleled reliability and experience. As industry standards, EST4300 will help you operate more effectively and safely, so you may remain global competitive.

- EST4300-GP Smart Gage Pressure Transmitter
- EST4300-AP Smart Absolute Pressure Transmitter
- EST4300-DP Smart Differential Pressure Transmitter
- EST4300-HP Smart High-static Differential Pressure Transmitter
- EST4300-LT Smart Flange-mounted Liquid Level Transmitter
- EST4300-RG/RD Smart Remote Differential Pressure Transmitter

# Metallic Capacitance Smart Differential Pressure Transmitter

## Introduction

EST4300 Metallic Capacitance Pressure Transmitter is the new generation of Smart Capacitance Differential Pressure Transmitter developed by our company, for which Eastsensor owns independent intellectual property rights. The metallic capacitance sensors are smart and high-precision, which are manufactured with introduced advanced technology from overseas. With digital compensation technology compensating for temperature and static pressure, the sensors improve the accuracy of measurement and reduce the temperature drift. The metallic capacitance sensors have been the darling of transmitter market due to long-term stability, high reliability, self-diagnostic capability as well as excellence cost performance.



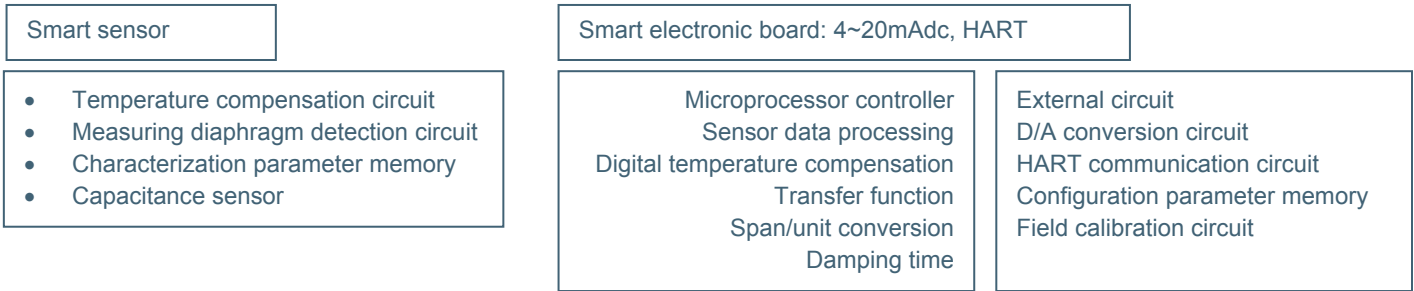
Besides the well-tested sensors, EST4300 also features advanced digital compensation and communication function. All these features make EST4300 the high-end smart transmitters of multiple purposes. With HART 388 or Rosemount 275 field communicator, EST4300 can perform address polling, test, configuration, and calibration. Remote commissioning can be completed through the communication between transmitter and the control cabin, installation site or any terminal in the loop with the help of field communicator or commissioning device; Local span trimming can be performed through the zero/span magnetic rod at the top of the transmitter. Note: A minimum resistance of 250 ohms between terminals and power supply is required when performing remote communication.

## Features

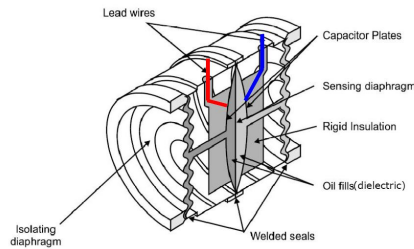
- Microprocessor-based high flexibility and enhanced features
- Enhanced self-diagnostic capacity;
- Wide range 0~150 Pa~42MPa;
- Measurement accuracy above level 0.1/0.2, turndown 40:1
- Independent Zero & Span Adjustment;
- Perfect local and remote set-up and calibration function;
- Two-wire, HART-compliant, communicating with HART-compliant devices without interrupting;
- Digital compensation technology compensating for temperature and static pressure
- High stability and precision, adjustable damping and strong overload capacity;
- No mechanical transmission parts, less maintenance, firm and shock resistant;
- General components ensuring convenient maintenance;
- Zero/span magnetic rod local adjustment without opening the cover;
- Optional contact diaphragm materials, explosion-proof and available for 24 hours;
- Proved performance and reliability.

## Working Principle

EST4300 Smart Transmitter consists of sensor module and electronic board. The sensor includes capacitance sensor, measuring diaphragm detection circuit, temperature sensor and temperature compensation circuit; the electronics board includes microprocessor controller and external circuit, capable of pressure signal conversion of 4~20mA dc. This section below gives a brief introduction about the working principle.



## Smart Sensor Module



### Capacitance Sensor

Through isolating diaphragm and oil fill system, the pressure was transmitted to the diaphragm at the center of  $\delta$  cabin. The diaphragm is an elastic component for testing the differential pressure. The displacement of the diaphragm is proportional to differential pressure, and the maximum displacement is 0.10mm (0.004inch). The position of the measuring diaphragm is detected by the detection circuit of capacitors two sides' plate.

### Detection circuit of the diaphragm

The circuit is used to convert the sensor pressure to voltage signal, which is proportion to the pressure and is used for CPU sampling.

### Temp. Sensor and Temp. Compensation

With characterization calibration, perform temperature cycling test to the working temp of sensing element, and store the data as temperature compensation data (TCD) to the EEPROM inside the sensor; Test the working temp of the sensor element while in operation, perform contrast

operation between the TCD of characterization EEPROM and the tested temp data, and compensate the temp drift error through CPU.

### Microprocessor Controller

Apart from the operation of the transmitter, the Microprocessor Controller also functions the sensor data processing, digital temperature compensation, transfer function computing, conversion between engineering unit and span, output type set, damping value set, self-diagnosis and HART communications.

### Parameter Memory

Save all the configuration data remote / local modified by the transmitter and the data can be kept in the memory even when the power is off.

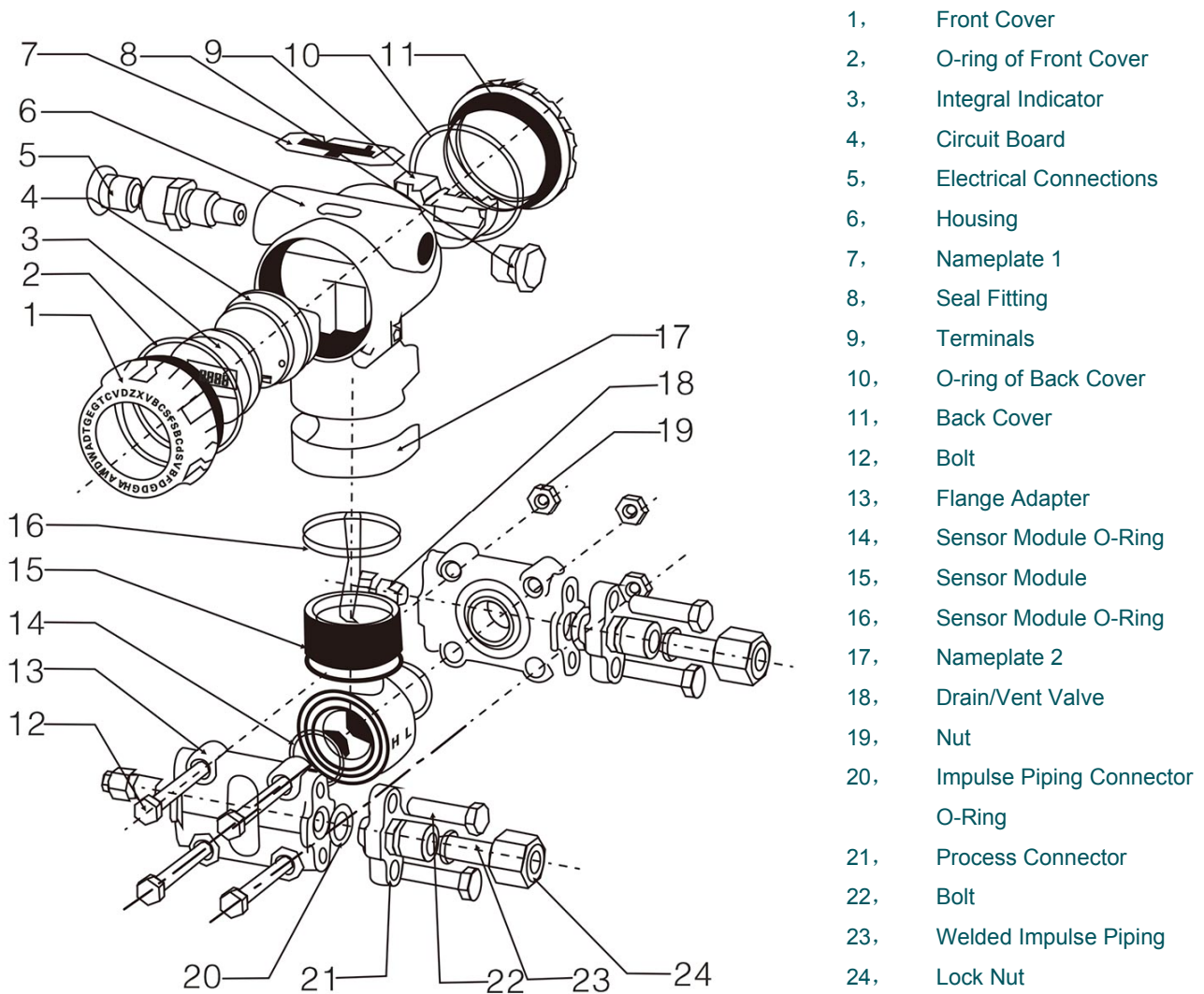
### D/A Transducer

D/A Transducer converts the digital signal corrected by the microprocessor into analog signal, and transmits it to output loop.

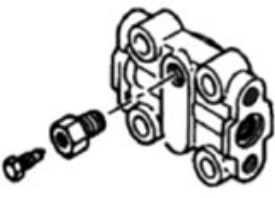
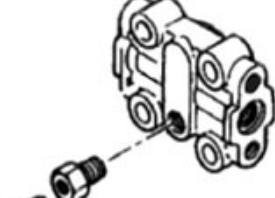

### HART Communication

Digital communication circuit provides interfaces between the transmitter and interface 388 or the control system. The circuit is composed of receiving and sending sections. The receiving section detects the FSK signal superimposed on 4~20mA loop and the sending section superimposes the signal on to 4~20mA loop likewise.

## Exploded View of EST 4300



## Side-mounted Drain/Vent Valve

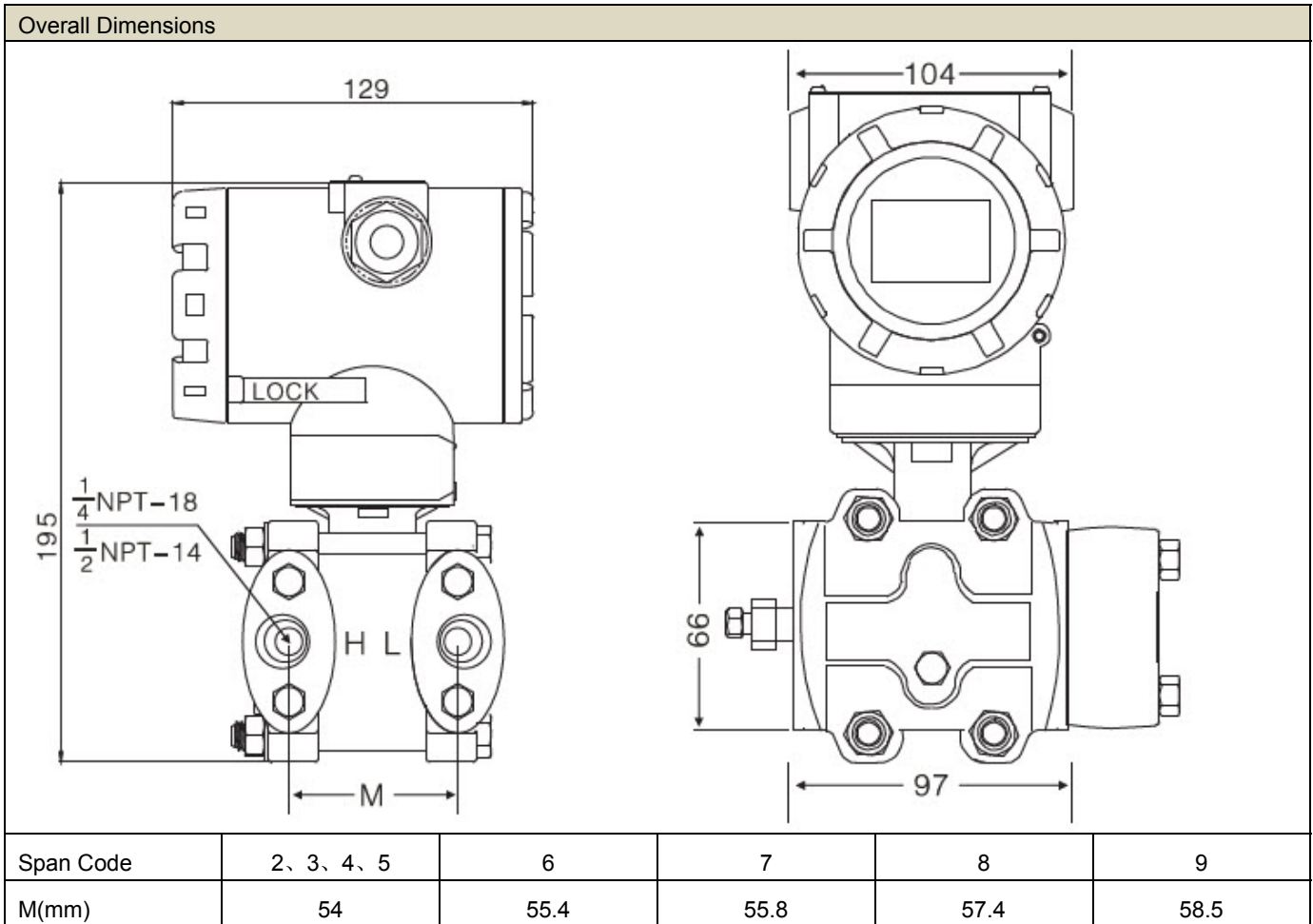
Drain/Vent Valve at the top of the flange	Drain/Vent Valve at the bottom of the flange	Drain/Vent Valve at the back of the flange
		



**Note Drain/Vent Valves are located at the back of the flange unless specified in the order.**

- Order No. D1 For liquid process application, vertically mount the transmitter, and the side-mounted drain/vent valves at the top of the flange will allow gases to vent.
- Order No. D1 For gas process application, vertically mount the transmitter, and the side-mounted drain/vent valves at the bottom of the flange will drain the liquid.

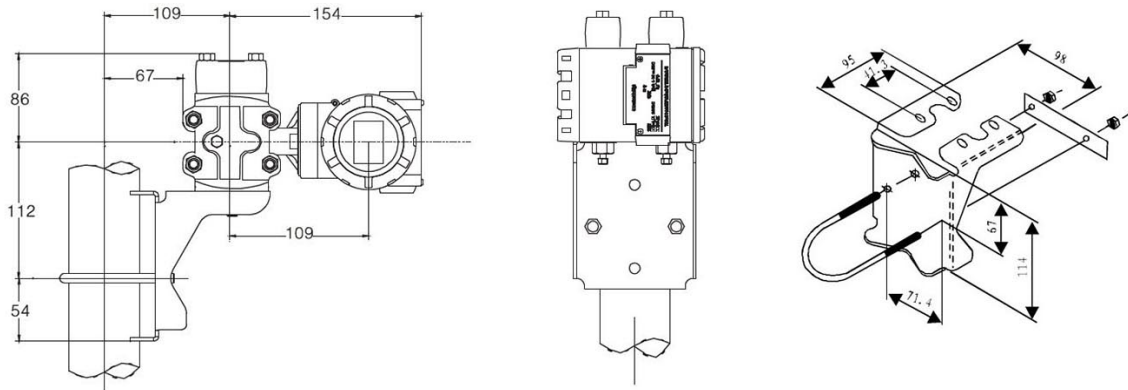
## EST4300 Dimensional Drawings



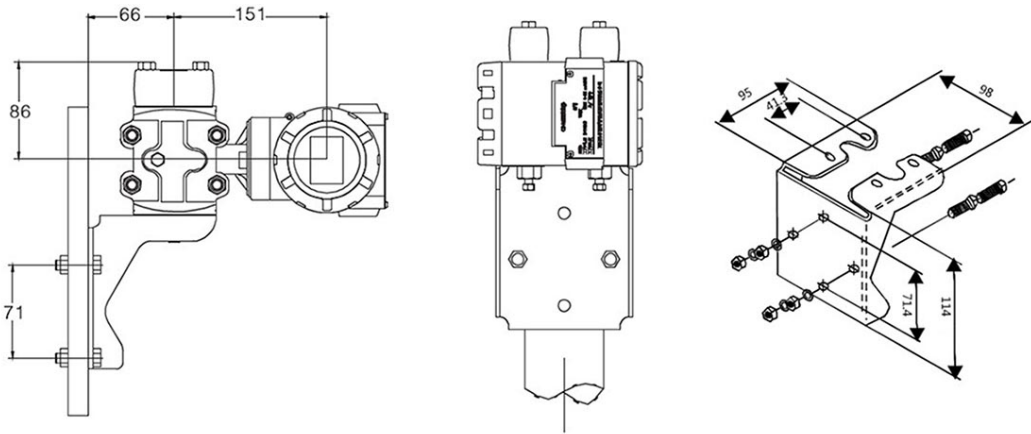
## Field Installation and External Connections

Mounting bracket dimensions and three installation methods. Different bracket options enable independent installation from the process. Applicable to DP, GP, HP, and AP, three options as below ❶ Pipe Mounting Bracket 1--Ordering Code B1; ❷ Panel Mounting Bracket--Ordering Code B2; ❸ Piping Mounting Bracket 2--Ordering Code B3.

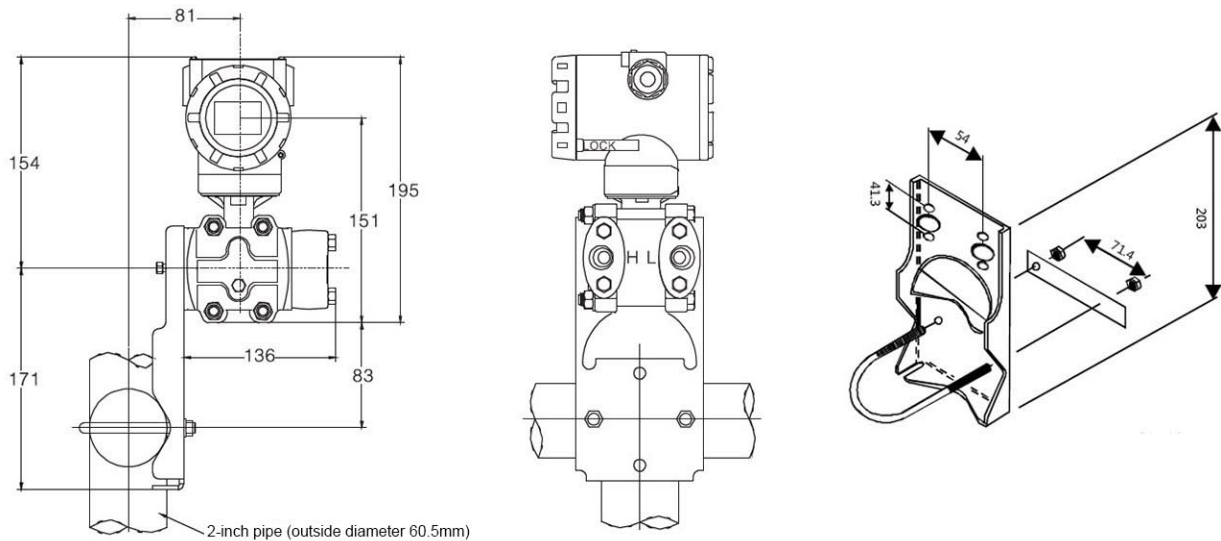
Pipe Mounting A

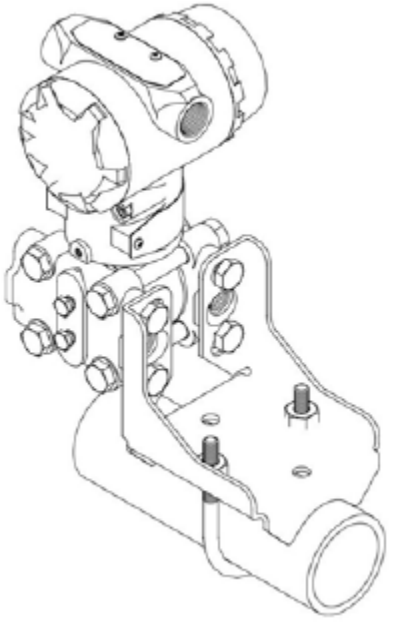
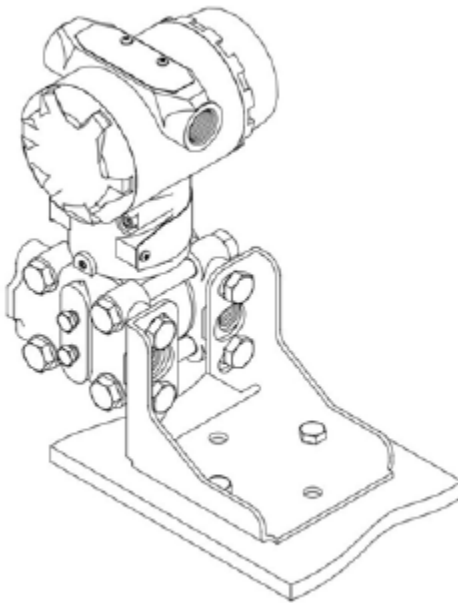
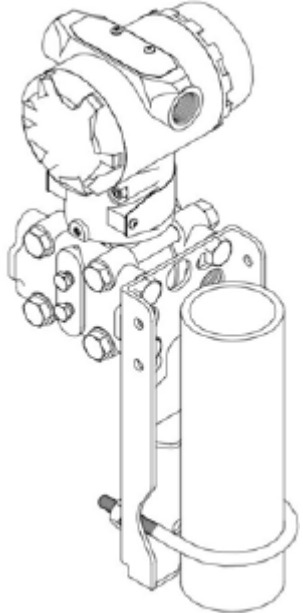


Panel Mounting

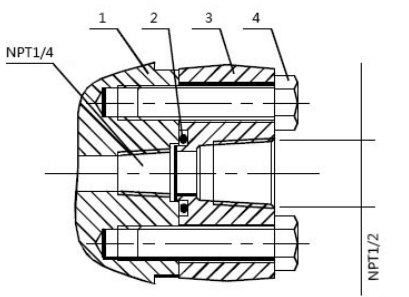
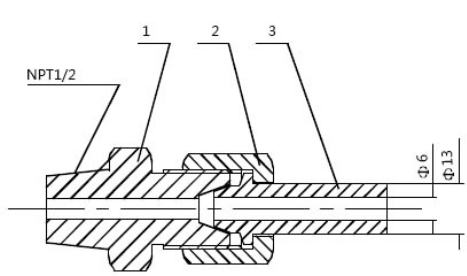
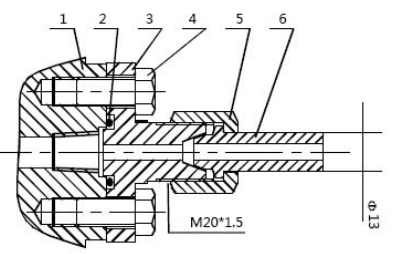


Pipe Mounting B



Optional Bracket for Pipe Mounting--- (See Ordering Procedure B1)	Optional Bracket for Panel Mounting---(See Ordering Procedure B2)	Optional Bracket for Pipe Mounting- --(See Ordering Procedure B3)
		

## Impulse Piping Connections

		
<p>A: NPT Female Connection</p>	<p>B: NPT1/2 connector and back-welded impulse piping</p>	<p>C: T-shaped connector</p>
<ol style="list-style-type: none"> <li>1. Capsule Flange</li> <li>2. O-Rings</li> <li>3. A: NPT Female Connector</li> <li>4. Flange Mounting M10*1.5 Thread</li> </ol>	<ol style="list-style-type: none"> <li>1. NPT1/2 and transition joint connecting with spherical cone</li> <li>2. Nut M20*1.5</li> <li>3. Ball joint ( weldable with impulse piping at <math>\phi 13</math>)</li> </ol>	<ol style="list-style-type: none"> <li>1. Capsule Flange</li> <li>2. O-Rings</li> <li>3. Sphere-cone joint M20 *1.5 Male Thread</li> <li>4. Flange Mounting Bolt M10*1.5</li> <li>5. Nut</li> <li>6. Ball joint weldable to impulsing pipe at <math>\phi 13</math></li> </ol>

## Electrical Wiring

