

# Manual Differential Tryckgivare DMP305x

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## Safety precautions

- ⚠ Pressure / differential pressure transmitter should be installed by professional engineers or qualified technical personnel, product specifications and important information provided on the label should be carefully read before installation and wiring operations.
- ⚠ Pressure / differential pressure transmitter is powered by an external power supply, the power supply circuit should comply with energy-limiting circuit by relevant standards, and pay attention to the high voltage circuits there may exist.
- ⚠ The maximum static pressure overload has been stated on the product label, the process maximum pressure should not exceed the full span of sensor.
- ⚠ Using pressure / differential pressure transmitter in hazardous areas, installation, use and maintenance should also comply with the operation manual and relevant requirements of national standards.
- ⚠ Attention please! Disassemble the instruments under the condition of normal atmospheric pressure only.

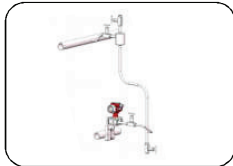
## Product usage

### Pipeline pressure measurement-pressure transmitter



For high-temperature steam measuring, more than half-tube cooling water should be pre-injected in the condenser. After the steam pipes are stable, slowly open the shut-off valve to start measuring.

### Pipeline pressure measurement-differential pressure transmitter



For high-temperature steam measuring, cooling water should be pre-injected into the guided pipe. After the steam pipes are stable, slowly open the shut-off valve to start measuring.

### Differential pressure measurement



Differential pressure transmitter is used for differential pressure measuring, especially suitable for micro pressure measurement of hydrostatic pressure such as filter and equipment leakage test and improving accuracy.

### Steam flow measurement



Guiding pressure tube uptilt 45°, the installation location should be lower than the process pipeline. Isolation tank and multiple shut-off valves should be increased, cooling liquid should pre-injected into the guiding pressure tube, and open the drain/vent valve periodically, clear the residual gas and liquid in the guiding pressure tube to ensure accuracy.

### Liquid flow measurement



Guiding pressure tube tilt down 45°, the installation location should be lower than the process pipeline. Isolation tank and multiple shut-off valves should be increased, open the drain/vent valve periodically, clear the residual gas and liquid in the guiding pressure tube to ensure accuracy.

### Air flow measurement



Guiding pressure tube uptilt 45°, the installation location should be lower than the process pipeline. Isolation tank and multiple shut-off valves should be increased, open the drain/vent valve periodically, clear the residual gas and liquid in the guiding pressure tube to ensure accuracy.

### Sealed container level measurement



For sealed container level measurement, isolation tank and multiple shut-off valves should be increased, open the drain/vent valve periodically, clear the residual gas and liquid in the guiding pressure tube to ensure accuracy.

### Open container level measurement-single flange level transmitter



For open container level measurement, media compatibility should be considered, install on location where the liquid level and temperature changes stably to improve accuracy.

### Sealed container level measurement-single flange level transmitter



Single flange diaphragm system used for sealed container level measurement, isolation tank and multiple shut-off valves should be increased, open the drain/vent valve periodically, clear the residual gas and liquid in the guiding pressure tube to ensure accuracy.

⚠ Media in process pipeline or guiding pressure tube may be effected by the surrounding environment, and may freeze. So anti-freezing measurements are needed.

## Install pressure transmitter

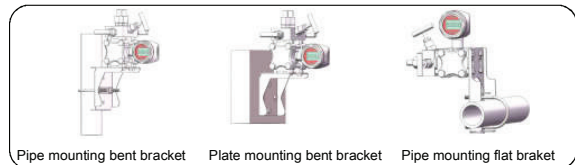
### Pressure transmitter- Installation



Direct installation

Bracket installation

### Differential pressure transmitter-bracket installation



Pipe mounting bent bracket

Plate mounting bent bracket

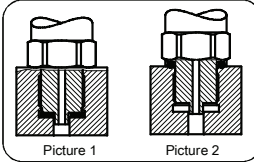
Pipe mounting flat bracket

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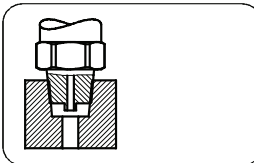
### Process connection

#### Straight thread connection



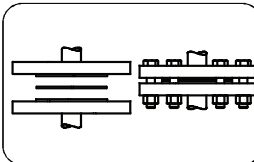
Picture 1: The length of pressure transmitter thread should be longer than the depth of the thread to ensure the seal of head face gasket is effective.  
Picture 2: The length of pressure transmitter thread should be shorter than the depth of the thread to ensure the seal of root gasket is effective.

#### Taper thread connection



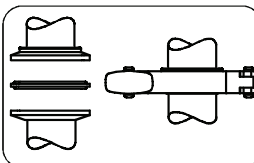
Sealing with teflon tape or sealant glue. When thread lock hard, there is a small part space.

#### Flange connection



Choose gasket according to medium features and temperature range, pay attention to the bolt balance lock.

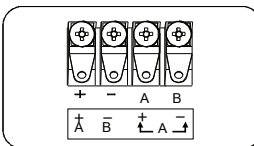
#### Clamp connection



Choose gaskets which meet the health standards, to avoid excessive locking clamp and squeeze gasket and diaphragm and cause measuring error.

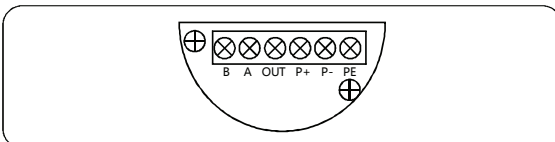
### Electrical connection

#### Module terminals- four terminals



Lable	Two wires	Three wires	Four wires
+	Power+	Power+	Power+
-	Power-	Power-	Power-
A		Signal+	Signal+
B			Signal-

#### Module terminals- six terminals ( Only for Modbus-RTU/RS485 )

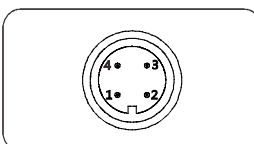


Lable	P+	P-	A	B	OUT	**PE
Modbus-RTU/RS485	Power+	Power-	A+	B-		Housing
Five wires	Power+	Power-	A+	B-	*Signal+	Housing ground

\*Signal: 4-20mA

\*\*PE: Housing ground terminals, please operate according to users' demands.

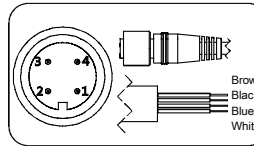
#### Aviation plug(M12\*1 - 4 pins)



Lable	Two wires	Three wires	Four wires	Modbus-TRU/RS485
1	Power+	Power+	Power+	Power+
2			Signal-	B-
3		Signal+	Signal+	A+
4	Power-	Power-	Power-	Power-

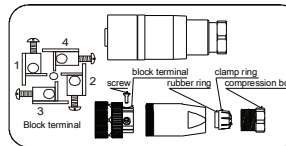
### Electrical connection accessories

#### Aviation plug (with cable)



Lable	Two wires	Three wires	Four wires	Modbus-TRU/RS485
1/brown	Power+	Power+	Power+	Power+
2/white			Signal-	B-
3/blue		Signal+	Signal+	A+
4/black	Power-	Power-	Power-	Power-

#### Aviation plug (without cable)

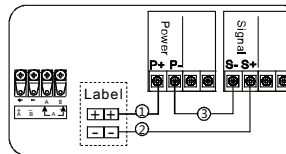


Lable	Two wires	Three wires	Four wires	Modbus-TRU/RS485
1	Power+	Power+	Power+	Power+
2			Signal-	B-
3		Signal+	Signal+	A+
4	Power-	Power-	Power-	Power-

⚠ Please refer to the label for specific signal outline type.

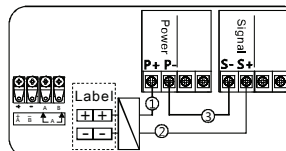
### Signal connection

#### 4-20mA two wires(module terminals-four terminals)



- Power supply+ is connected with transmitter terminals+
- Signal+ is connected with transmitter terminals-
- Signal- is connected with power supply-

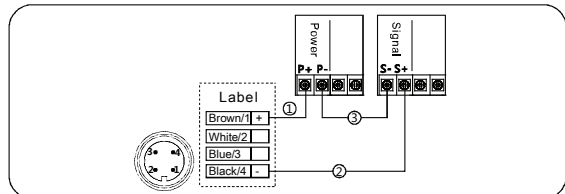
#### 4-20mA two wires, intrinsic safety(module terminals-four terminals)



- Power supply+ is connected with transmitter terminals+
- Signal+ is connected with transmitter terminals-
- Signal- is connected with power supply-

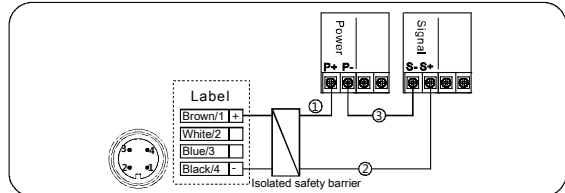
⚠ Please note that the wiring should refer to the installation information provided by the safety barrier manufacturer.

#### 4-20mA two wires (aviation plug with cable)



- Power supply+ is connected with transmitter terminal 1/brown cable
- Signal+ is connected with transmitter terminals 4/black cable
- Signal- is connected with power supply-

#### 4-20mA two wires, intrinsic safety(aviation plug with cable)



- Power supply+ is connected with transmitter terminal 1/brown cable
- Signal+ is connected with transmitter terminals 4/black cable
- Signal- is connected with power supply-

⚠ Please note that the wiring should refer to the installation information provided by the safety barrier manufacturer.

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## Power supply

Independent linear direct current power supply is suggested to be adopted for the power supply of pressure transmitter, over large resistive load will result in a large pressure drop, so it requires to calculate the all-in resistance of signal cable, display meter and other record and display equipment, to ensure the voltage provided to the pressure transmitter accord with normal operating requirements.

- Standard current signal output: 12-30VDC,
- Current signal output with HART: 16.5-55VDC,
- Current signal output with intrinsic safety : 12-30VDC,
- Modbus-RTU/RS485 signal output: 5VDC/9-30VDC,
- 0.5-4.5VDC voltage signal output: 5VDC/6-15VDC.

## Grounding

- Shielded twisted pair signal cable is the best, in order to avoid ground loops, Shielded layer adopts single-grounding, insulated floating at the side of pressure transmitter, and grounding at the control cabinet.
- Transient built-in module is only valid in the case of well-grounded, stainless steel housing and internal ground terminals is used for direct grounding.

## Cable protection system

### Standard protection system



In order to avoid the liquid flowing along with the cable to flow into the terminal box or result in waterproof joint effusion, an U-shaped ring needs to be configured between pull box and pressure transmitter as the picture shows, and please ensure the U-shaped bottom is under the pressure transmitter. Considering the maintenance

and replacement, enough cable length needs to be reserved.

### Explosion-proof tube protection system



⚠ Using explosion-proof pressure transmitters in dangerous situations, metal explosion-proof tube should be used to connect the cable into the threading box, and lead to safe zone.

## Intrinsic safety type

⚠ When choose intrinsic safety pressure transmitter, as the power, signal connection, grounding and transient solutions are different provided by the intrinsic safety and isolated safety barrier suppliers, please pay attention to the connection of signal line.

## Field adjustment



With LCD buttons, terminal box external buttons or software as HART protocol, it is convenient for range adjustment. For detailed operation, please refer to instructions of display, HART protocol and so on.

## Zero point adjustment

- Please make an adjustment after installation because the mounting position will affect zero setting.
- The vessel is absolutely empty (No pressure or medium on the measuring diaphragm, the vessel connect to the atmospheric air)
- Power connection please refer to "Keys operation manual-keyboard shortcuts-PV=0"
- Please set PV=0 after three weeks of installation to ensure the best accuracy
- Set PV=0 each year.

⚠ Zero point adjustment is only available for gauge pressure transmitter

## Full span adjustment

- Fill the vessel with medium (fill to the required level)
- The static pressure value should be within the minimum and the maximum pressure range.
- Power connection please refer to "Keys operation manual-keyboard shortcuts-full span adjustment"

## Factory resets

- Please refer to "Keys operation manual-keyboard shortcuts-factory resets"

## Maintenance

Requires no maintenance

## External cleaning

Please notice the following when cleaning:

- Use washing agent which will not damage to the instruments
- Prevent the process diaphragm from mechanical damage, eg: the mechanical damage caused by sharp objects.
- Mechanical cleaning of metal diaphragm(technical and reference) is prohibited.
- Do not point the nozzles to the diaphragm directly when doing internal cleaning by pressure washer.

## Transportation / storage

- Do not store at outside
- Keep dry and dust-free
- Do not expose to the corrosive medium
- Avoid solar radiation
- Avoid mechanical shock and vibration
- Storage temperature: -40~85°C
- Maximum relative humidity: 95%

## EMC statement

- EMC equipment instructions 2014/30/EU.
- CE mark suggests the instruments are in line with EU standards
- Users need to ensure the whole equipment conform to all the applicable standards.

## Retransport

- Keep clean of the pressure transmitter. Stay away from any dangerous medium!
- Please adopt proper package to avoid damage in transportation.

## Exceptions

- When measurement signal appears abnormal, please make sure whether it is the process pressure abnormal or measuring system error, or installation environment impact or pressure transmitter abnormal, then analyze the reasons and take corresponding measures.
- No signal output, process pressure changes but no corresponding output signal change or their changes do not correspond, the pressure transmitter may abnormal, it needs to check whether the power supply polarity or circuit cut, voltage, power and load resistance meets the normal working requirements, it also needs to check whether there is leakage and pressure impulse line blockage and shut-off valve does not open and so on.
- The output signal error is large or outside the normal range, it needs to check whether the supply voltage, power consumption, and load resistance meets the normal working requirements of pressure transmitters, measuring range settings, adjust the correct calibration. It also needs to check whether there is pressure leakage and guiding pressure tube blockage, shut-off valve does not open and whether is rapid temperature fluctuations in the installations.

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### LCD function

Display module is used for field adjustment to complete all the parameters setting and site configuration before measuring. The internal and external buttons can realize its normal use in safe and hazardous areas. (For stainless steel housing, only internal buttons can be used in security zones. The operation methods of buttons are totally same as the means of standard aluminium alloy housing.)

#### Products with LCD



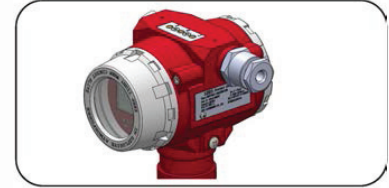
The display module of products with LCD is installed in the terminals, which can be viewed through the lenses.

#### Openings in safe area



Internal buttons operation in safe area, open the cover, use the internal buttons for operation.

#### Buttons operation in dangerous area

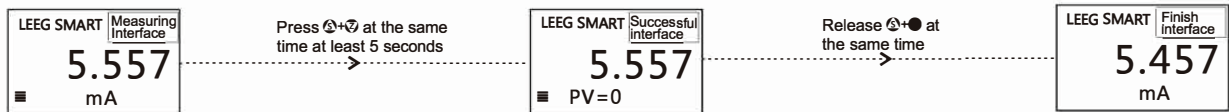


External buttons operation in dangerous area, turn over the label, use the external buttons for operation.

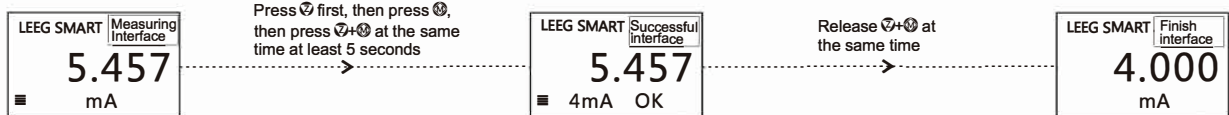
### Keys operation

For example, factory setting parameters; pressure range -10~100kPa, display unit mA, operate in the atmosphere.

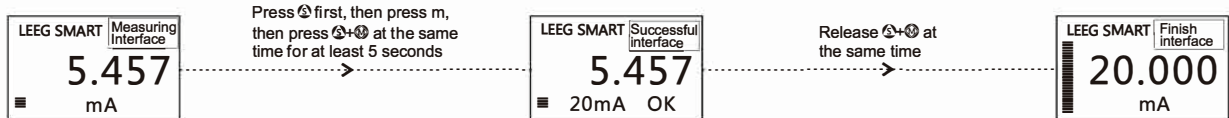
#### Set PV=0



#### 4mA re-range with pressure

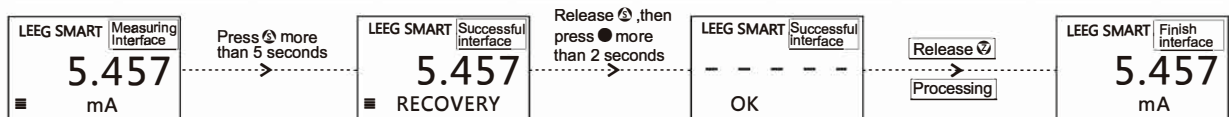


#### 20mA re-range with pressure

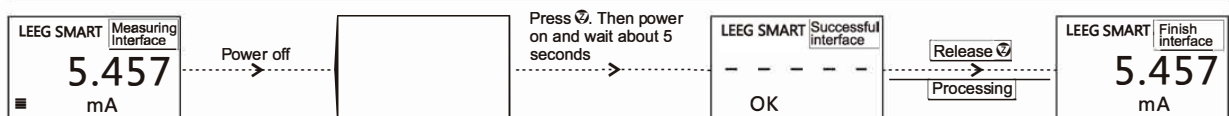


### Factory reset

#### Method 1:



#### Method 2:

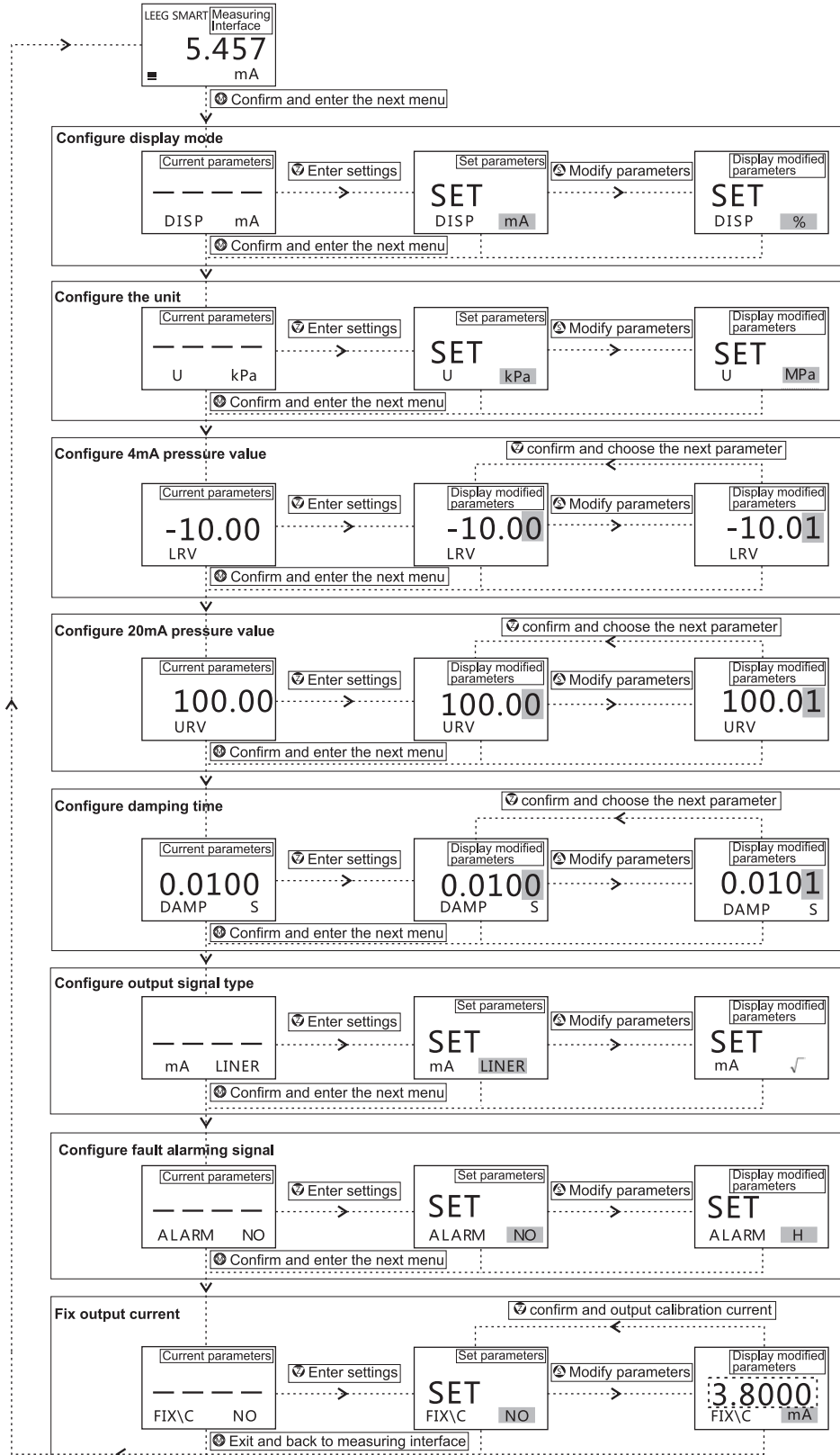




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## Detailed operating instructions

### Measuring Interface



### Parameters table

#### Display mode

%	Percentage
PV	Process variable
mA	Current

#### Units

kPa
MPa
bar
psi
mmHg
mmH2O
inH2O
ftH2O
inHg
mHg
TORR
mbar
g/cm2
kg/cm2
Pa
ATM
mm
m

#### Lower range value

-19999-99999
--------------

#### Upper range value

-19999-99999
--------------

#### Damping time

0-100S
--------

#### Output signal type

<input checked="" type="checkbox"/>	Square root
<input type="checkbox"/>	Linearity

#### Fault alarm signal

NO	None
H	20.8mA
L	3.8mA

#### Output current

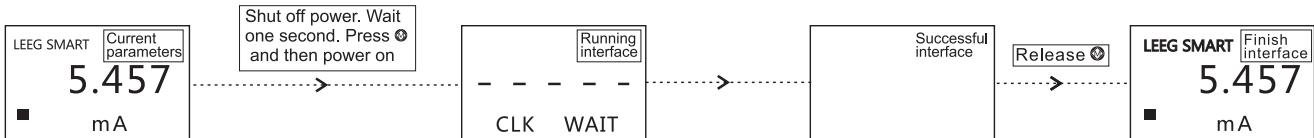
NO (none)
3.8000 mA
4.0000 mA
8.0000 mA
12.000 mA
16.000 mA
20.000 mA
20.800 mA

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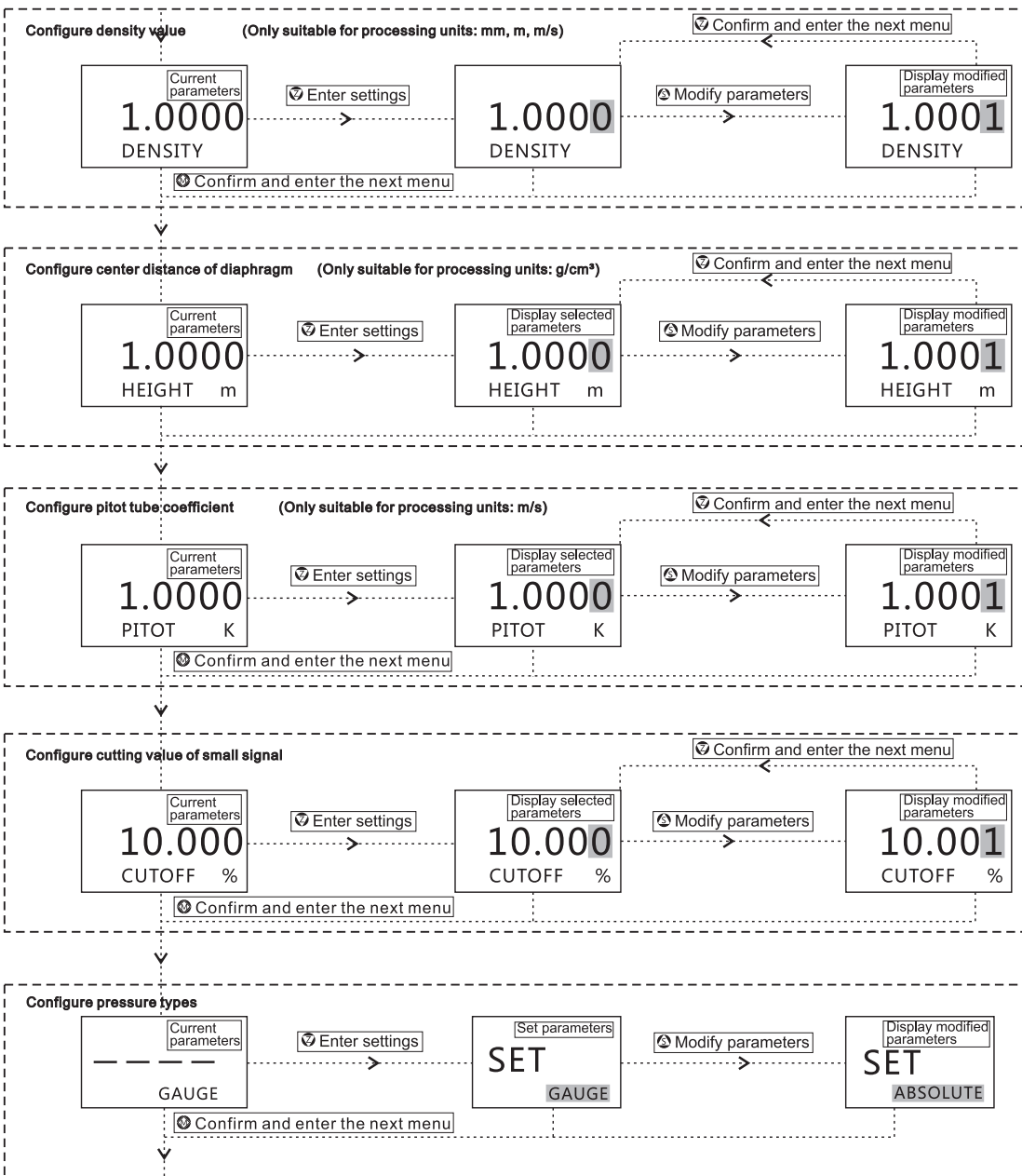
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## Display hidden menu

Display hidden menus



## Detailed operation instructions



### Parameters table

#### Configuring range of density value

0.0001-99999

#### Configuring range of center distance

0.0001-99999

#### Configuring range of coefficient

0.0001-99999

#### Configuring range of cutting value

0-99.999

#### Pressure types

GAUGE	gauge, differential
ABSOLUTE	absolute pressure