

Pressure Transmitter with Display,
Rangeable Wet/Wet Differential

Product Details

The Omega differential PX3005-DIFF is a compact, rangeable, pressure transmitter ideal for monitoring pressures in process automation, hydraulic systems, compressors, pumps, and in tank level applications where consistent, reliable pressure measurement is essential. The PX3005-DIFF utilizes a unique encapsulation construction of a MEMs piezoresistive pressure sensor coupled to an advanced microprocessing to provide superior accuracy and performance.

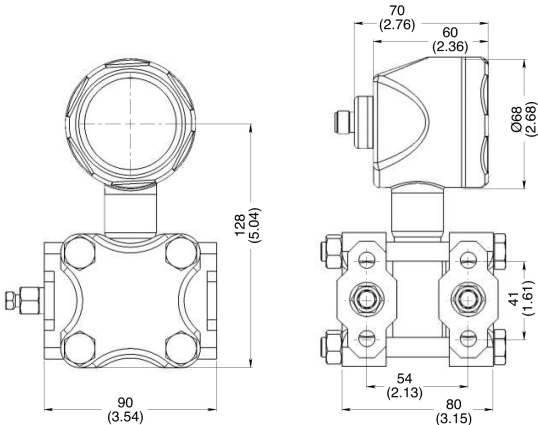
The unique construction enables high line pressure operations and superior protection from pressure overloads. The rugged 316 stainless-steel enclosure is IP67 rated making it suitable for wash down environments. A 5-digit backlit LCD allows for a full precision representation of process variable. Available in ranges from 1 to 1,500 psi, the intelligent transmitter module allows for configuration of the 4 to 20 mA signal, display of input or output, and choice of 19 measurement units. The output signal can be adjusted to re-arrange the transmitter or “tare” unwanted fluid head preloads. Rangeability is capable of adjusting zero and span are from -100 to 100% FS URL (Upper Range Limit) with a minimum span of 30% URL. This means a 15 psi transducer can have the zero set between -15 to FS 15 psi. For example, zero could be set for -15 psi and maximum 15 psi so the output would be 4 mA at -15 psi, midpoint 12 mA would be 0 psi and 20 mA would be 15 psi.

Features

- 0.075% Accuracy
- Linear or Square Root Output
- Adjustable Pulsation Dampening
- LCD Displays Either Process Variable, mA, or %
- Nineteen User Selectable Engineering Units
- IP67 316 SS Enclosure



Product Number	Pressure Range	Pressure Type
PX3005-25WDWBI	-25 to 25 inH2O	Differential
PX3005-160WDWBI	-160 to 160 inH2O	Differential
PX3005-1KWDWBI	-1,000 to 1,000 inH2O	Differential
PX3005-150DWBI	-70 to 150 psi	Differential
PX3005-400DWBI	-70 to 400 psi	Differential
PX3005-1.5KDWBI	-70 to 1,500 psi	Differential



Specifications

Turndown = nominal range of the device / set span of device

EXAMPLE: a PX3005-1KWDWBI with set span of 500"H₂O TD = 1000"H₂O/500"H₂O = 2

Accuracy (NLHR, 20°C ±5°C):

±0.075TD% SPAN

(Square root output accuracy is 1.5 times linear output accuracy)

Long Term Stability:

±0.2% URL/60 months

Ambient Temperature Effects -20 to 80°C (-4 to 176°F):

±(0.1 +0.1TD)% SPAN

Static Pressure Effects:

Effect on zero ±0.15TD % SPAN/10MPa (1450 psi); Effect

Power Supply Effects:

± 0.005TD% SPAN/V (Zero and Span)

Mounting Position Effects:

Install error less than 400Pa (1.60" H₂O) can be corrected by PV = 0 reset

Vibration Effects:

GB/T 1827.3/IEC61298-3 tests, 20g (5 to 2000 HZ, max <±3 mm), <0.1% URL

Supply Voltage:

10.5 to 55VDC

Output Signal:

4 to 20mA Two wire, linear or square root output selectable

Sensor Response Time:

200 mS

Damping Time:

Selectable, 0 to 100 S

Load Resistance Ω:

<(U-10.5)/0.021

Transmission Distance:

< 1000m

Power Consumption:

500mW(20.8mA output @ 24VDC)

Operating Temperature:

-20 to 70°C (-4 to 160°F)

Storage Temperature:

-40 to 85°C (-40 to 185°F)

Media Temperature:

-40 to 120°C (-40 to 250°F)

Environmental Rating:

IP67

Media:

Fluids and gasses compatible with 316 SS

Process Connection/Material:

¼" -18NPT F/316 SS

Electrical Connection:

4 pin male M12

Isolating Diaphragm:

316L SS

Sensor Fill Fluid:

Silicone Oil

Sensor Seal:

O-ring, FKM

Housing Material:

316 SS

Weight:

Net Weight: about 3kg (without mounting bracket and process connection adaptor)

Range Limit Table

Nominal Value		Minimum Span		UPPER (URL)		LOWER (LRL)		Static Pressure Limit		Hi Side Over Range Limit		Lo Side Over Range Limit	
Mbar	"H ₂ O	Mbar	"H ₂ O	Mbar	"H ₂ O	Mbar	"H ₂ O	Bar	Psi	Bar	Psi	Bar	Psi
60	25	0.02	0.8	60	25	-60	-25	250	3600	250	3600	160	2300
400	160	0.04	1.6	400	160	-400	-160	400	5750	250	3600	160	2300
2500	1000	0.25	10	2500	1000	-2500	-1000	400	5750	250	3600	160	2300
Bar	Psi	Bar	Psi	Bar	Psi	Bar	Psi	Bar	Psi	Bar	Psi	Bar	Psi
10	150	0.1	1.5	10	150	-5	-70	400	5750	250	3600	160	2300
30	400	0.3	4	30	400	-5	-70	400	5750	250	3600	160	2300
100	1500	1	15	100	1500	-5	-70	400	5750	250	3600	160	2300

PX3005

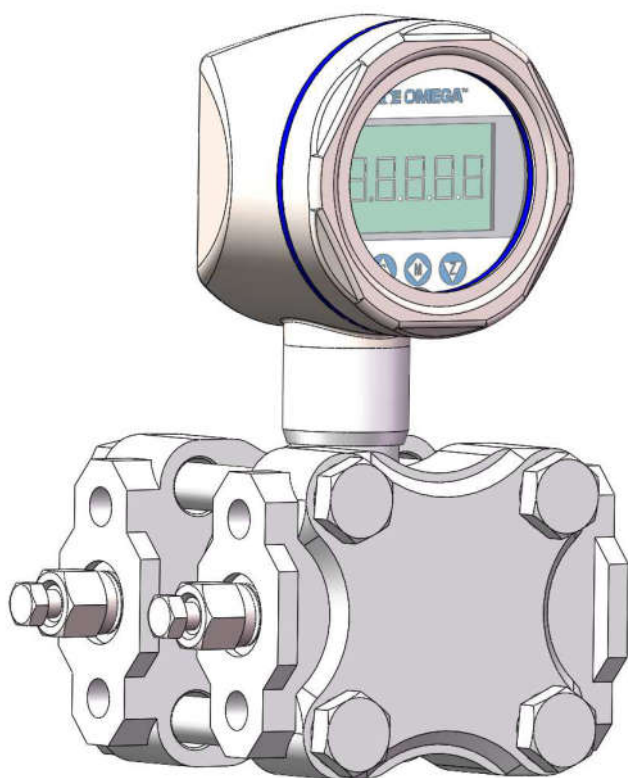
Rangeable Industrial Pressure Transmitter

INSTRUCTION
SHEET

M-5721/1018

Shop online at omega.com e-mail: info@omega.com

For latest product manuals: omegamanual.info



Safety precautions

- ⚠ Pressure / differential pressure transmitter should be installed by professional engineers or qualified technical personnel. The 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 that 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.
- ⚠ When 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.

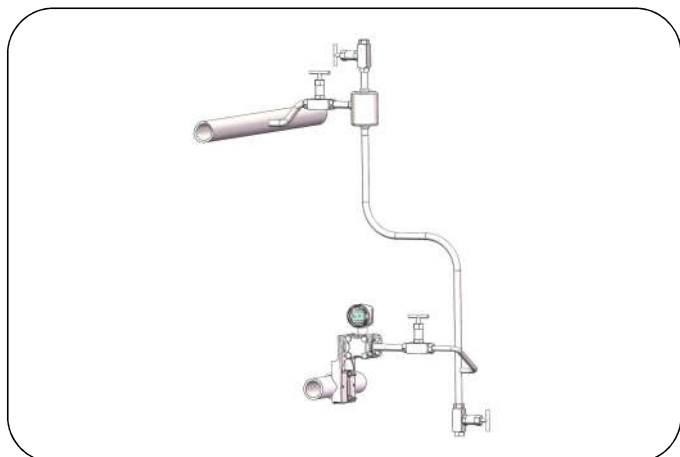
Product usage

Pipeline pressure measurement-pressure transmitter



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

Pipeline pressure measurement-differential pressure transmitter



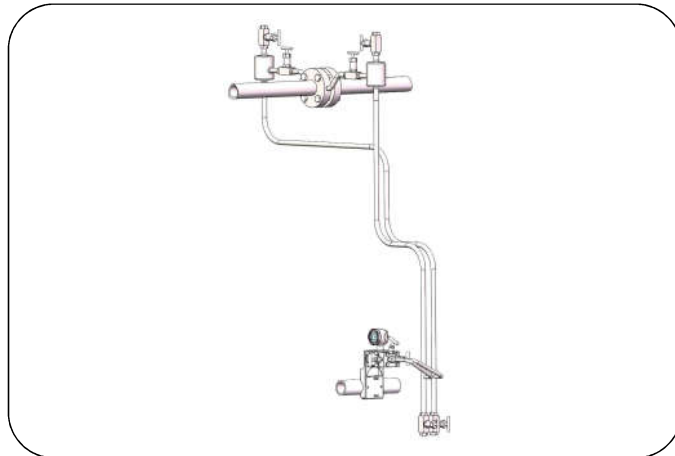
For high-temperature steam measuring, cooling water should be pre-injected into the guided pipe. After the steam pipes are stable, slowly open the shut-off valve to start measuring.

Differential pressure measurement



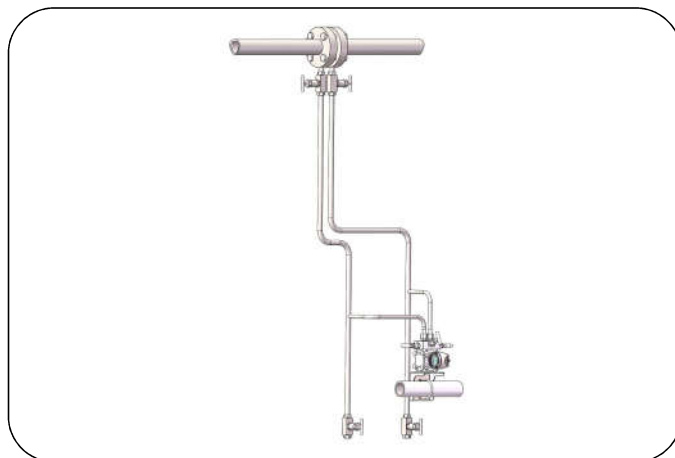
Differential pressure transmitter is especially suitable for micro pressure measurement of hydrostatic pressure such as filter and equipment leakage test and improving accuracy.

Steam flow measurement



The pressure tube should be tilted up 45°, the installation location should be lower than the process pipeline. Isolation tank and multiple shut-off valves should be used. Cooling liquid should be pre-injected into the guiding pressure tube. The drain/vent valve should be opened periodically, clearing the residual gas and liquid in the guiding pressure tube to ensure accuracy.

Liquid flow measurement



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

Air flow measurement



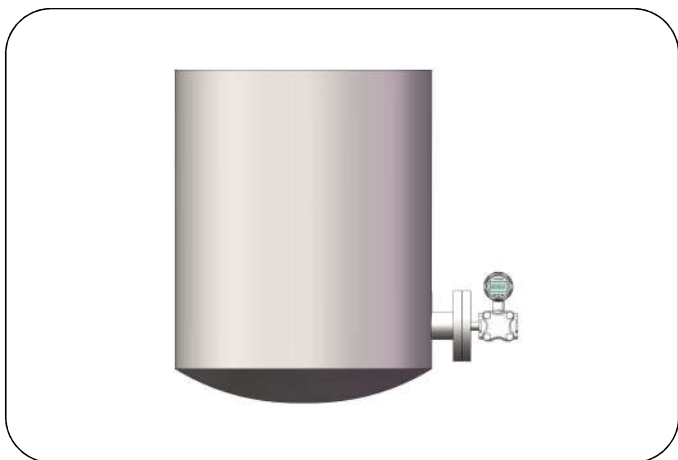
The pressure tube should be tilted up 45°, the installation location should be lower than the process pipeline. Isolation tank and multiple shut-off valves should be used. Open the drain/vent valve periodically to clear the residual gas and liquid in the guiding pressure tube to ensure accuracy.

Sealed container level measurement



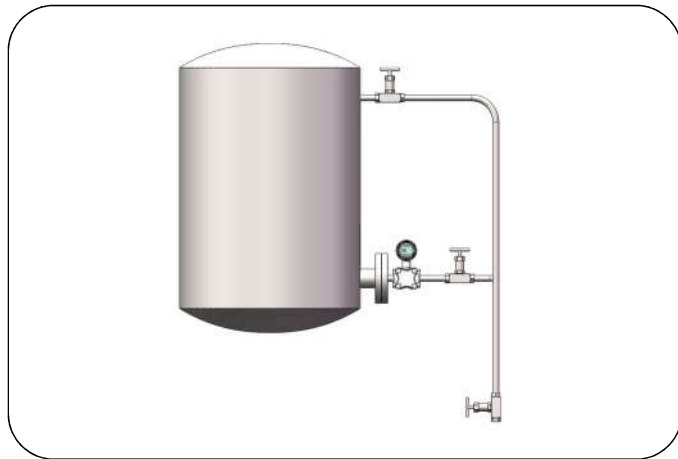
For sealed container level measurement, isolation tank and multiple shut-off valves should be used. Open the drain/vent valve periodically to clear the residual gas and liquid in the guiding pressure tube to ensure accuracy.

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

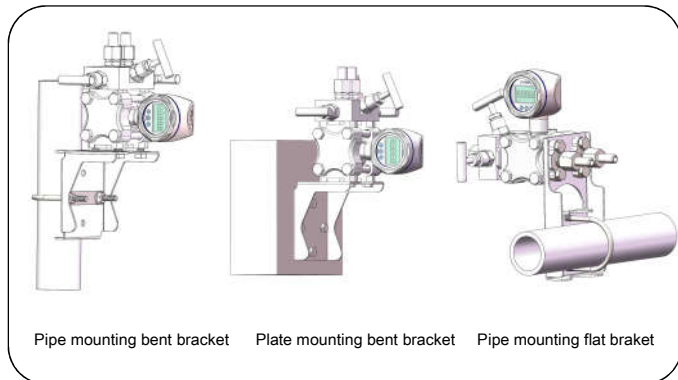


When single flange diaphragm system is used for sealed container level measurement, Isolation tank and multiple shut-off valves should be used, open the drain/vent valve periodically, clear the residual gas and liquid in the guiding pressure tube to ensure accuracy.

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

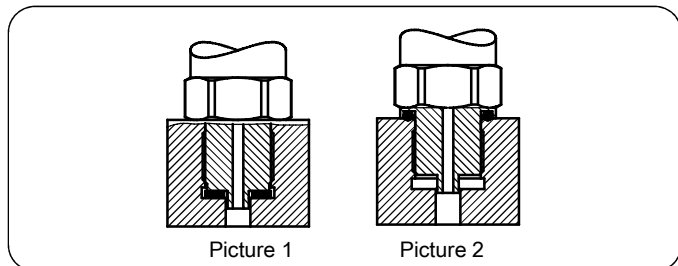
Install pressure transmitter

Differential pressure transmitter-bracket installation



Process connection

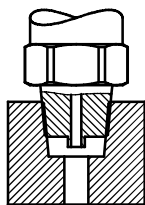
Straight thread connection



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



1. Inspect port and fitting to ensure that both are free of contaminants and excessive burrs and nicks.
2. Apply a stripe of an anaerobic liquid pipe sealant around the male threads leaving the first two threads uncovered. If no liquid sealant is available, wrap PTFE tape 1-1/2 turns in a clockwise direction, viewed from the pipe end, leaving the first two threads uncovered.

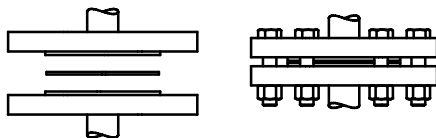
CAUTION: Follow manufacturer's recommendations for proper application of any sealant to prevent contamination.

3: Screw finger tight into the port.

4: Wrench tighten the fitting 1.5 to 3 Turns Past Finger Tight, TPFT. Consider final orientation position of display, as to not exceed the recommended TPFT. Total thread engagement should be 3.5 to 6 turns.

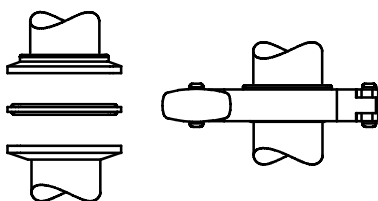
CAUTION: Never back out components to achieve proper alignment. Loosening will corrupt the seal and contribute to leakage and failure.

Flange connection



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

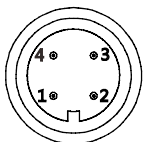
Clamp connection



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

Electrical connection

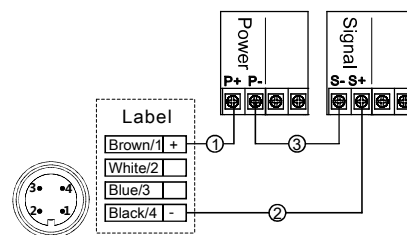
Aviation plug(M12*1 - 4 pins)



Label	Two wires
1	Power+
2	
3	
4	Power-

Signal connection

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



- ① Power supply+ is connected with transmitter terminal 1/brown cable.
- ② Signal+ is connected with transmitter terminals 4/black cable.
- ③ Signal- is connected with power supply-.

Power supply

It is recommended to use an independent linear direct-current power supply. Verify that the combined loop resistances (signal cable, display meter, and other equipment) are not too high, so that the voltage supplied to the pressure transmitter meets the normal operating requirements.

- Standard current signal output: 12-30VDC.

Grounding

- Using cable with shielded twisted-pair signal has the best effect. To avoid ground loop, shielded layer adopts single-end grounded.
- Transient protection is effective only in the case of good grounding. Metal shell and internal grounding terminals are used to the nearest ground directly.

Field adjustment



Range can be adjusted with LCD buttons. For detailed operation, please refer to instructions.

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 LCD function instructions-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 LCD function instructions.

Factory resets

- Please refer to LCD function instructions.

Maintenance

Requires no maintenance.

External cleaning

Please notice the following when cleaning:

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

Transportation / storage

- Do not store 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

- This pressure transmitter conforms to 2014/30/EU EMC standard and bears the CE mark.
- Users need to ensure that all equipment conform to all the applicable standards.

Retransport

- Remove all media from surfaces of the pressure transmitter.
Always refer safety data sheet for proper personal protection equipment when handling dangerous medium!
- Please adopt proper package to avoid damage in transportation.

Discard disposal

- The instrument is not restrained by WEEE instruction 2002/96/EG and laws of relevant countries.
- Please pass the instrument to specialized recycling companies other than local recycling points.

LCD function

Prior to commissioning, use the display module to setup all the parameters according to the site configuration.

Products with LCD



The display module of products with LCD can be viewed through the lenses.

Openings in safe area

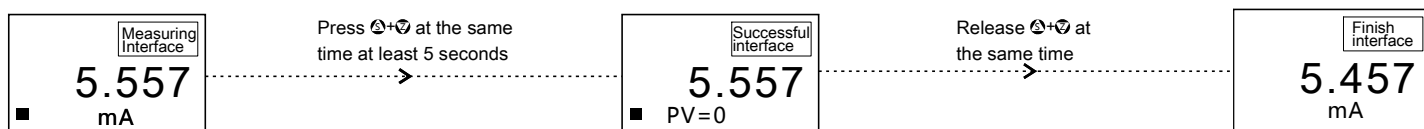


Adjustments to operating parameters can be done by removing the protective cover. When commissioning is complete, replace cover, taking care not to cross thread, and tighten snugly by hand.

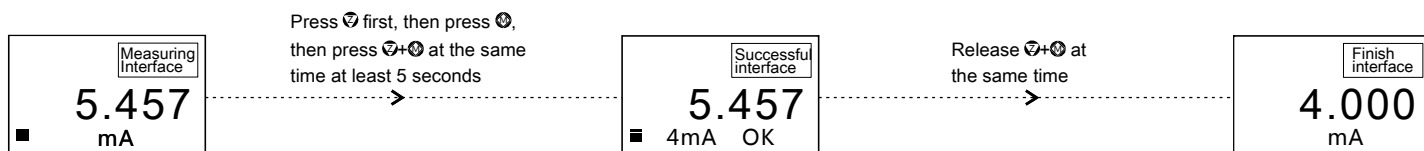
Keys operation

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

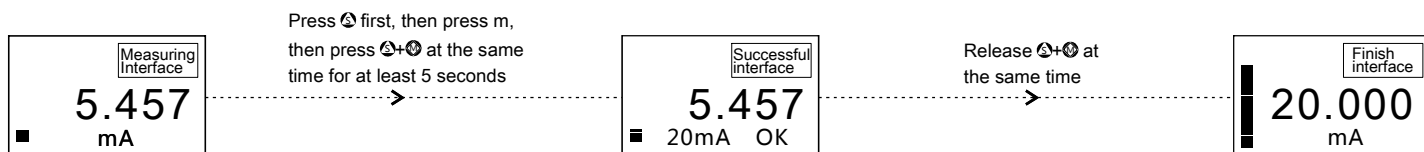
Set PV=0



4mA re-range with pressure

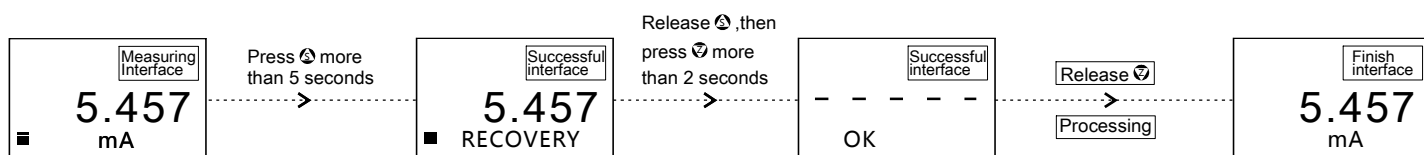


20mA re-range with pressure

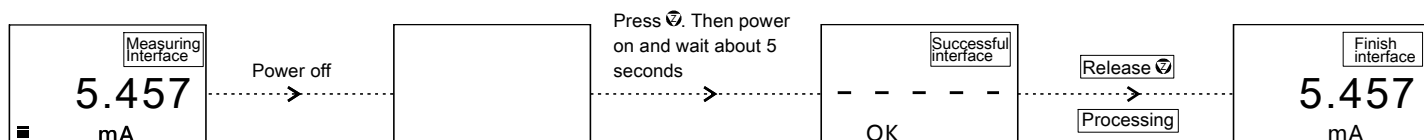


Factory reset

Method 1:

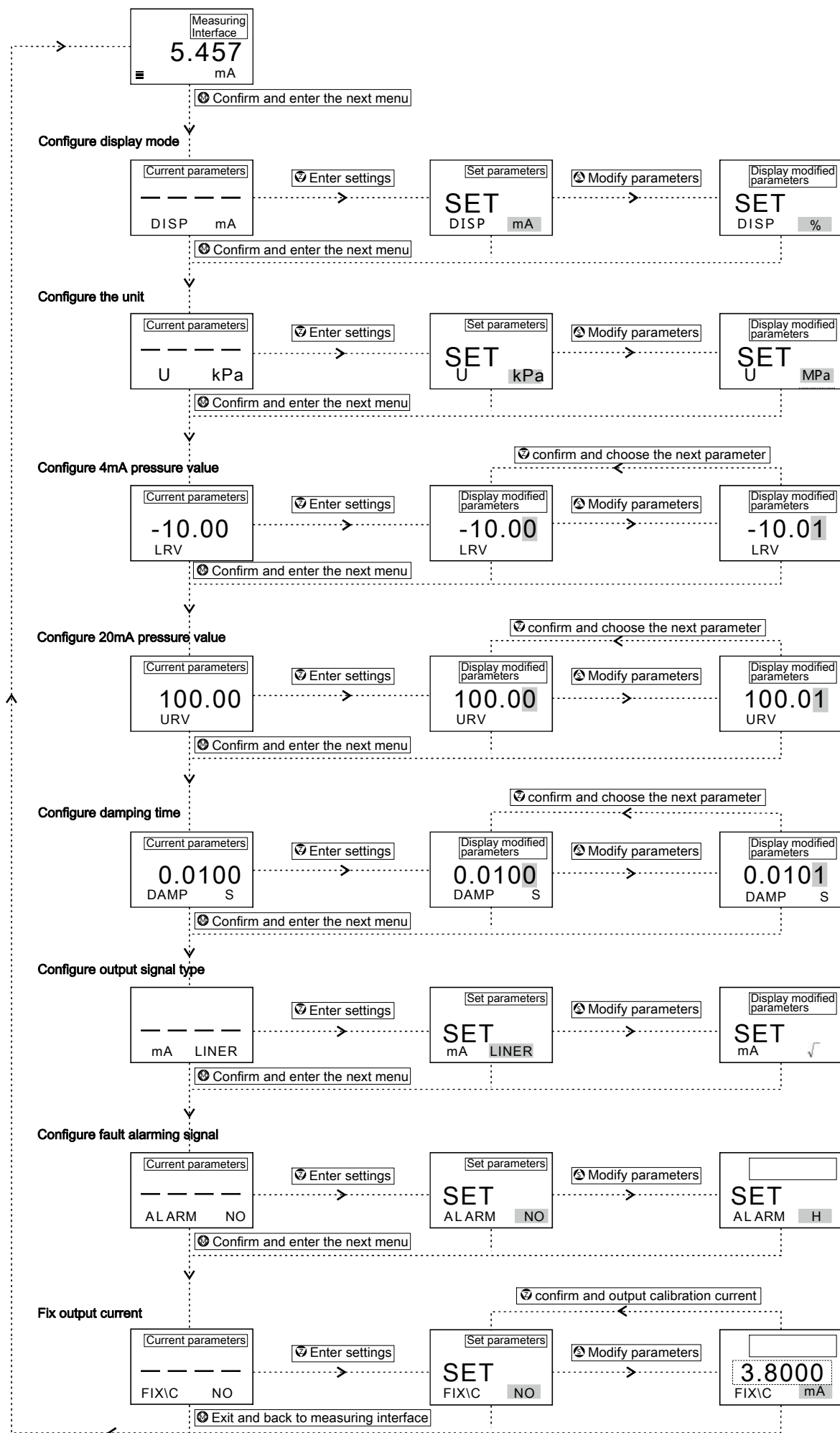


Method 2:



Detailed operating instructions

Measuring Interface



Parameters table

Display mode

%	Percentage
PV	Process variable
mA	Current

Units

(↓, ↑)

kPa
MPa
bar
psi
mmHg
mmH2O
mH2O
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"/>	Squar root
<input type="checkbox"/>	Linearity

Fault alarm signal

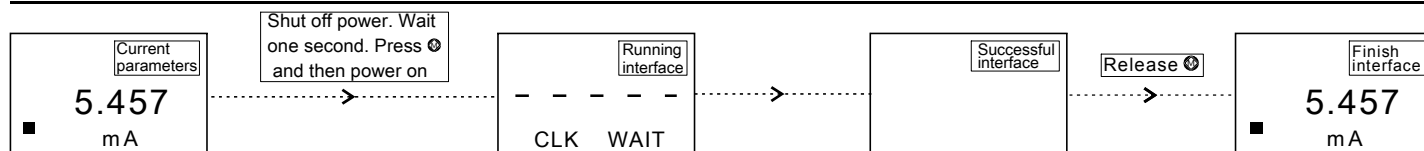
N O	None
H	20.8mA
L	3.8mA

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

Display hidden menu

Display hidden menus



Detailed operation instructions

