



# APT 3200

## Smart Pressure Transmitter

for Gauge / Absolute Pressure Measurement



**PRESSURE**



# APT 3200

## Introduction

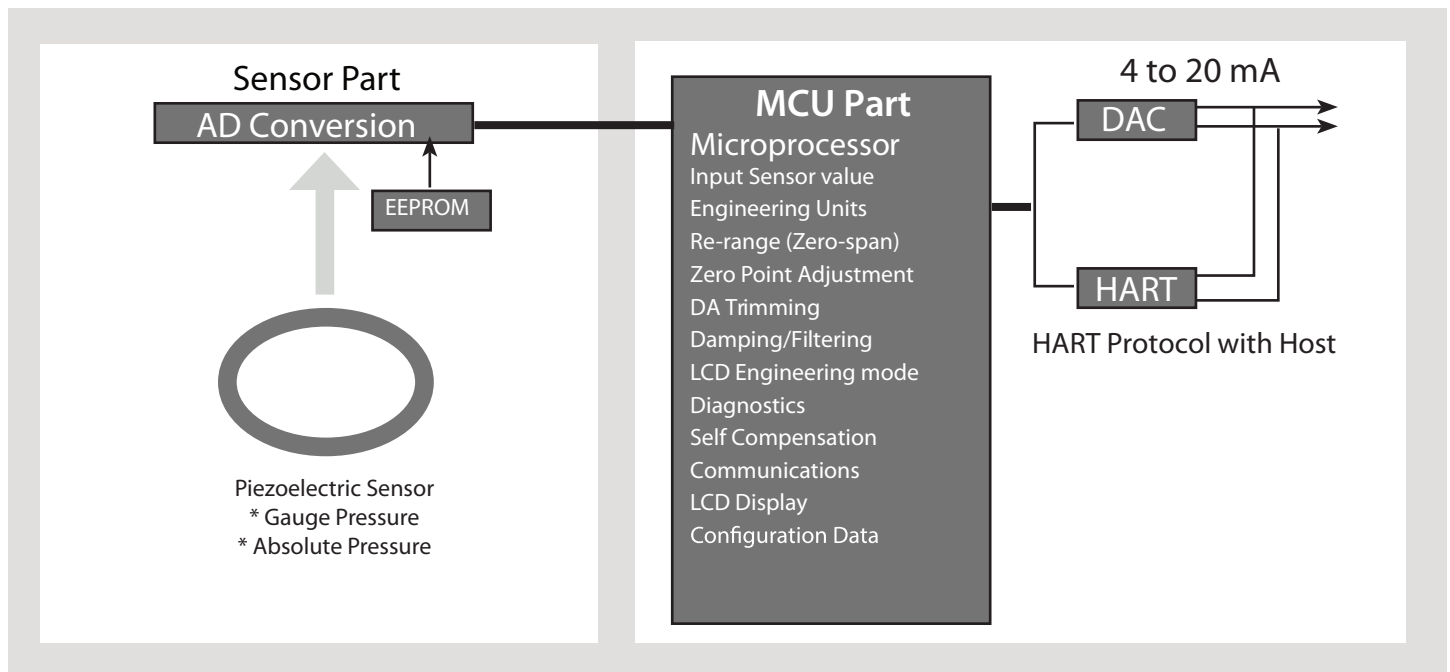
The APT 3200 Smart Pressure Transmitter is a microprocessor based high-performance transmitter, which has an automatic temperature compensation function integrated into its advanced signal processing circuitry to ensure high reliability and performance corresponding to change of ambient temperature. The APT 3200 uses a capacitance pressure transducer to measure differential pressure. It is used in level monitoring applications and to measure liquid, gas, and steam flow. All sensor data is input, modified and stored in EEPROM.

## Function

- Flexible Sensor Input : GP, AP, Flush Mount
- Various Output : 4-20mA, Digital Signals
- Setting Various Parameters : Zero/Span, Trim, Unit, Fail-mode, etc.
- Self Diagnostic Function : Sensor, Memory A/D Converter, Power, etc.
- Digital Communication with HART protocol
- Explosion-proof Approval & Intrinsic Safety Approval: ATEX, FM, FM Canada, GOST, KCs, etc.
- Marine Certificate: ABS, LR, BV, DNV



## Functional Block Diagram



## Features

### Superior Performance

- High Accuracy :  $\pm 0.075\%$  of Calibrated Span (option :  $\pm 0.04\%$  of Calibrated Span)
- Long-Term Stability
- High Rangeability (100:1)

### Flexibility

- Measuring GP, AP
- Data Configuration with HART configurator

### Reliability

- Continuous Self-Diagnostic Function
- Automatic Ambient Temperature Compensation
- Fail-mode Process Function
- EEPROM Write Protection
- CE EMC Conformity Standards (EN50081-2, EN50082-2)

## Transmitter Description

ATP3200 Pressure transmitter can be easily configured from any host that support the HART protocol.

### Basic Setup

- Operational Parameters.
- 4-20mA Points (Zero/Span)
- Damping Time : 0.25-60 sec
- Tag : 8 alphanumeric characters
- Descriptor : 16 characters
- Message : 32 characters.
- Date : day/month/year

An optional LCD module plugs into the MCU module and displays the digital output in user configured unit.

### Calibration and Trimming

- Lower/Upper Range (zero/span)
- Sensor Zero Trimming
- Zero Point Adjustment
- DAC Output Trimming
- Transfer Function
- Self-Compensation

### Self-Diagnosis and Others

- CPU & Analog Module Fault Detection
- Communication Error
- Fail-mode Handling
- LCD Indication
- Temperature Measurement of Sensor Module

## Specifications

### Range and Sensor Limits

- Refer to Table 1.

### Zero and Span Adjustment Limits

- Zero and span values can be set anywhere within the range limits stated in Table 1. Span must be greater than or equal to the minimum span stated in Table 1.

### Output (Analog Current and Digital Data)

- LCD Display & ENG Mode
- Two wire 4-20mA user configurable for linear. digital process value superimposed on 4-20mA signal, available to any host that conforms to the HART protocol

### Power Supply & Load Requirement

- External power supply required.
  - \* 250 ohm load - 17.5 Vdc
  - \* up to a 550 ohm load - 24 Vdc
- Max. Loop Resistance =  $(E - 12) / 0.022$   
(E = Power Supply Voltage)
- Voltage Range : 12 to 45 Vdc
- Voltage Rating : 24 Vdc  $\pm 30\%$
- Loop Load
  - 0-1500 ohm - Operation
  - 250-550 ohm - HART Communications

### EMC Conformity Standards

- EMI (Emission) – EN50081-2:1993
- EMS (Immunity) – EN50082-2:1995

### Failure Mode

- Fail High : Current  $\geq 21.1$  mA
- Fail Low : Current  $\leq 3.78$  mA

## Storage Temperature

- -40°C to 85°C (without condensing)  
-40°F to 248°F

## Process Temperature Limits

(Range codes and approval codes may effect limits)

- -40°C to 120°C (-104°F to 248°F)

## Isolation

- Input/output isolated to 500Vrms (707 Vdc)

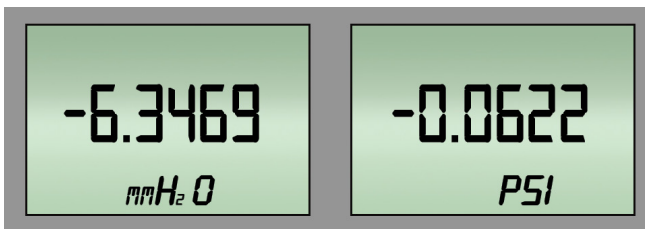
## Working Pressure Limits (silicone oil)

- Model G -100 -300KPa - # 3  
-100-3000 KPa - # 4  
0 -10,500KPa - # 5  
0-40,000 KPa - # 6  
0 - 75,000 KPa - # 7
- Model A 0-525 KPa - # 4  
0-3000 KPa - # 5  
0-5250 KPa - # 6

## 5 Digit LCD

- Express all pressure unit.
- Use 5 digit.
- Select decimal place (0 to 4)

## User Define Unit Function



## Change main parameter by Button

- Change Unit
- Change Upper range value
- Change Lower range value
- Change the Damping Second
- Select the Decimal Place
- Zero Trim
- Zero Adjustment



Moving within Menu : Zero  
Moving to below Menu : Span  
Moving Top Menu : Zero+Span

## Physical Specifications

### Wetted Materials

- Isolating Diaphragms: 316L SS, Tantalum, HAST-C

### Non-wetted materials

- Fill Fluid : Silicone oil (DC200)
- Electronics Housing : Aluminum, SS 316L (option)  
Flameproof and Waterproof (IP67)
- Cover O-ring : Buna-N
- Paint : Epoxy-Polyester or Polyurethane
- Mounting Bracket : 304 SS with U-bolt (304 SS)  
for 2" pipe
- Nameplate : 304 SS

### Process Connections

- 1/2-14 NPT Female
- 1/4-18 NPT (option)

### Electrical connections

- 1/2-14 NPT conduit with M4 Screw Terminals

### Weight

- 1.7 kg/3.74 lb (Standard - excluding options)
- 2.83 kg/ 6.23 lb (SS Housing- excluding options)

## Hazardous Location Certifications (option)

### KOSHA Approvals K1 Code:

\* KOSHA: Korea Occupational Safety & Health Agency  
 Flameproof for Class I, Zone 1 : Ex d IIC T6, IP67  
 Ambient Temperature : -20°C to 60°C  
 Max. Process Temperature : 80°C  
 Power Supply : Max. 45 Vdc  
 Output : 4 to 20 mA + HART, Max. 22 mA

### ATEX Approvals E1 Code:

CE 0344 II 2 G Ex d IIC T6, T5 or T4  
 Operating Temperature: -20°C ≤ Tamb ≤ +60°C T6 for process ≤ 85 C ; T5 for process ≤ 100°C T4 ≤ 130°C  
 APT3200 ATEX Certification is according to the below Standards : EN 60079-0 : 2006 EN 60079-1 : 2007

### ATEX Certification E2 Code:

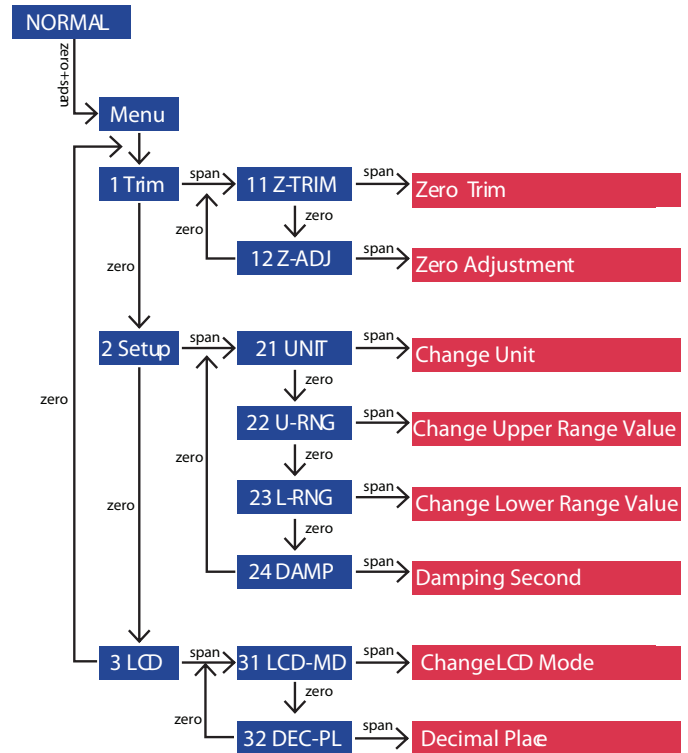
Intrinsic Safety: Ex ia T5 or T4  
 Ambient Temperature: -40°C to 80°C for T4,  
 -30°C to 40°C for T5 Ui=30Vdc, li=200mA, Pi=0.9W,  
 Ci=27nF, Li=104μH  
 Standards: EN 60079-0 : 2009, EN60079-11: 2007,  
 EN60079-26: 2007

### FM & FM Canada Approvals F1 Code :

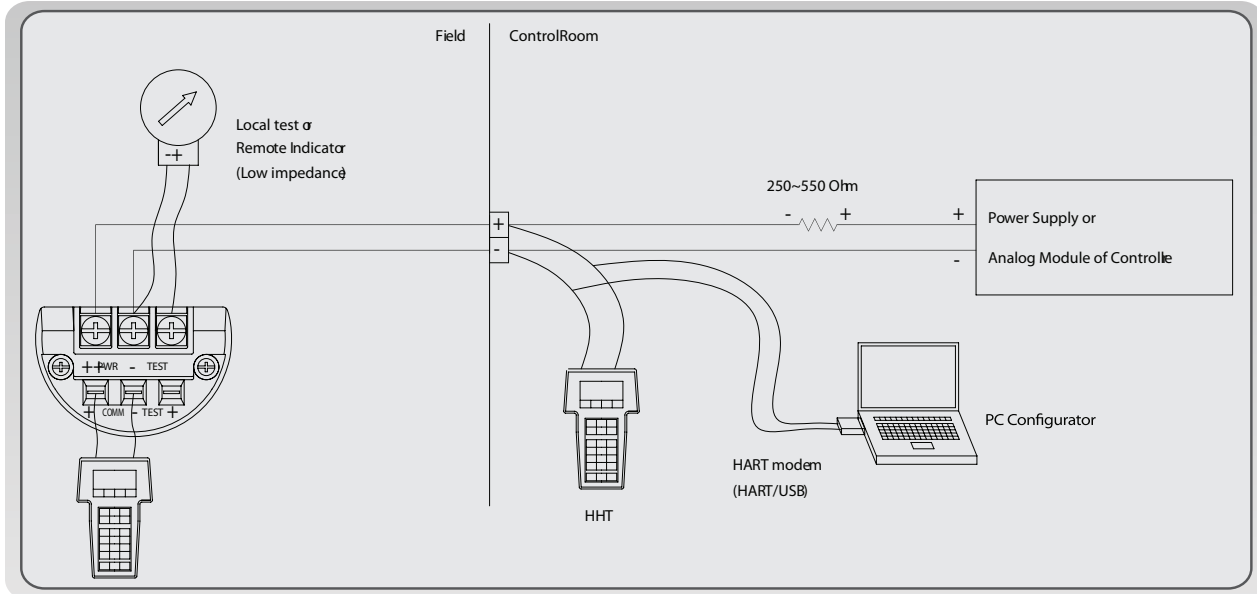
\* FM: Factory Mutual explosion proof  
 \* FM Canada: Canadian requirements  
 Explosion proof for Class I, Division 1  
 Groups A, B, C and D  
 Dust-ignition proof for Class II, Division 1,  
 Groups E, F and G  
 Dust-ignition proof for Class II, Division 1  
 "T6, see instruction for temperature code if  
 Process Temperature above 85°C"  
 Ambient Temperature : -20°C to 60°C

Enclosure: indoors and outdoors, NEMA Type 4X  
 Conduit seal required within 18" for Group A only.  
 Nonincendive for Class I, Division 2, Groups A, B, C & D;  
 Class II, Division 2, Groups E, F & G; and Class III,  
 Division 1, Temperature Code T4  
 Ambient Temperature : -20°C to 60°C

### Button Menu tree

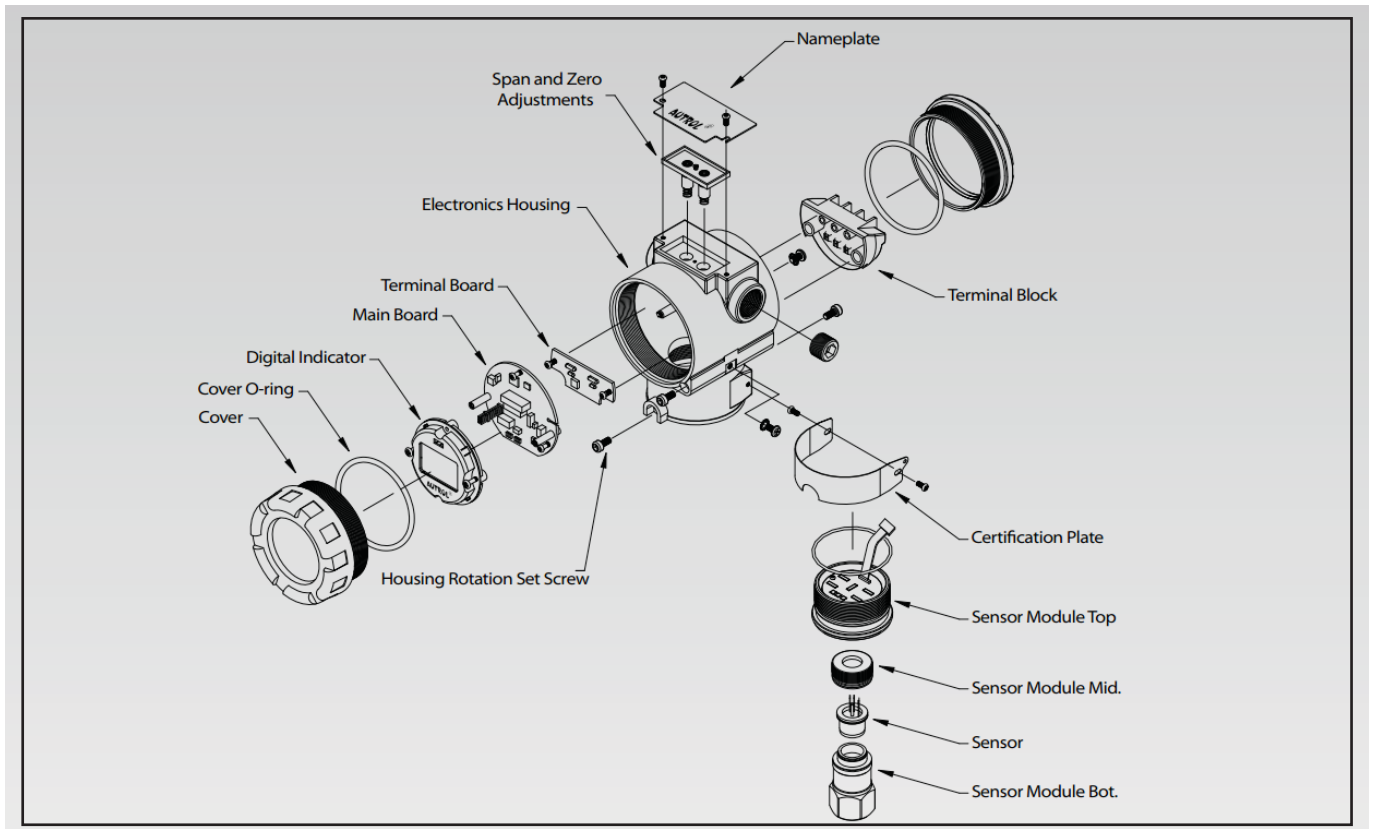


## Connection Diagram of Signal, Power, HHT for Transmitter



1. HHT (HART Communicator) or PC Configurator may connected at any termination point in the signal loop.
2. HART Communication requires a loop resistance between 250 and 550 ohm @ 24 Vdc
3. Power Supply
  - Voltage Range : 12 to 45 Vdc
  - Voltage Rating : 24 Vdc  $\pm$ 30%

## Exploded Drawing of APT3200



# General Specifications

(Rangeability = 100 : 1)

## 1. APT3200 – G/A Pressure Sensor Range

	APT3200 – G		APT3200 - A	
	Range (PSI)	Calibrated Span (PSI)	Range	Calibrated Span (PSI)
<b>3</b>	-100-150	1.5-150	NA	NA
<b>4</b>	-100-1,500	15-1,500	0-250	2.5-250
<b>5</b>	0-5,000	50-5,000	0-1,500	15-1,500
<b>6</b>	0-25,000	250-25,000	0-2,500	25-2,500
<b>7</b>	0- 60,000	600-60,000	NA	NA

## 2. Electrical Specifications

Power Supply	Voltage Range : 12 to 45 Vdc, Voltage Rating : 24 Vdc ±30%
HART Loop Resistance	250-550 ohm
Output Signal	4-20 mA dc / HART
Isolation	500 Vrms (707 Vdc)

## 3. Performance Specifications

Reference Accuracy	± 0.075% of Span (0.1URL ≤ Span ≤ URL) ± [0.025+0.005x(URL/Span)]% of Span (0.01URL ≤ Span < 0.1URL)
Ambient Temp. Effect	± [0.019%URL+0.125% Span] /28°C
Ambient Temperature	-40°C - 85°C (-40°F - 185°F)
LCD Meter Ambient Temp.	-30°C - 80°C (-22°F - 176°F)
Humidity Limits	5% - 100% RH
Process Temp. Limit	-40°C -120°C (-40°F - 248°C)
Power Supply Effect	± 0.005 % of Span per Volt
Stability	± [0.125%URL for 36 months

## 4. Physical Specifications

Isolating Diaphragm	316L SS
Electrical Connections	1/2 – 14 NPT with M4
Process Connection Size	1/2 – 14 NPT Female
2" Pipe Stanchion Type Bracket	Angle or Flat type
Weight (Excluding options)	1.7 kg/3.74 lb (Standard) 2.83 kg/6.23 (SS Housing)
Electronic Housing	Aluminum
Housing Class	Waterproof (IP67)

# Ordering Information

MODEL	Code	Description			
Type	D	Differential Pressure Transmitter (Static Pressure 13.79 MPa / 2000psi)			
	G	Gauge Pressure Transmitter			
	A	Absolute Pressure Transmitter			
Ranges		G/F		A	
		Range (KPa)	Min. Span (KPa)	Range (KPa)	Min. Span (KPa)
	3	-100-150	1.5	NA	NA
	4	-100 -1,500	15	0-250	2.5
	5	0-5,000	50	0-1500	15
	6	0-25,000	250	0-2500	25
	7	0-60,000	600	NA	NA
	X	Special			
Mounting Flange /Material		DIAPHRAGM		OTHER	
	M11	316L SS		316 SS	
	*M12	HAST-C		316 SS	
	*M13	Tantalum		316 SS	
	*M21	HAST - C		HAST-C	
Hazardous Location Certifications	K0	Maker Standard (Waterproof : IP67 )			
	K1	KCs Flameproof Approval	*K2	KCs Intrinsic Safety Approval	
	E1	ATEX (KEMA) Exposion proof	E2	ATEX (KEMA) Intrinsic Safety	
	F1	FM & FM Canada Explosion proof	*F2	FM & FM Canada Intrinsic Safety	
Fill Fluid	1	Silicone (DC 200)			
	*2	Inert fill (Halocarbon Oil)			
Process Connection	S	1/2 – 14 NPT Female (standard)			
	O	1/4 - 18 NPT Female (adapter)			
	X	Special			
Electrical Connection	1	1/2-14NPT Epoxy-Polyester Painted Aluminum			
	2	G1/2 Epoxy-Polyester Painted Aluminum (Adapter)			
	X	Special			
Option	M1	LCD Indicator			
	LPI	Lightning Protector (Internal)	LPE	Lightning Protector (External)	
	K	Oil Free Finish			
	2W	2 way Manifold Remote Type			
	BA	Stainless Steel Bracket (Angle type) with SS Bolts			
	BF	Stainless Steel Bracket (Flat type) with SS Bolts			
	ST	Stainless Steel Housing			
	X	Special			

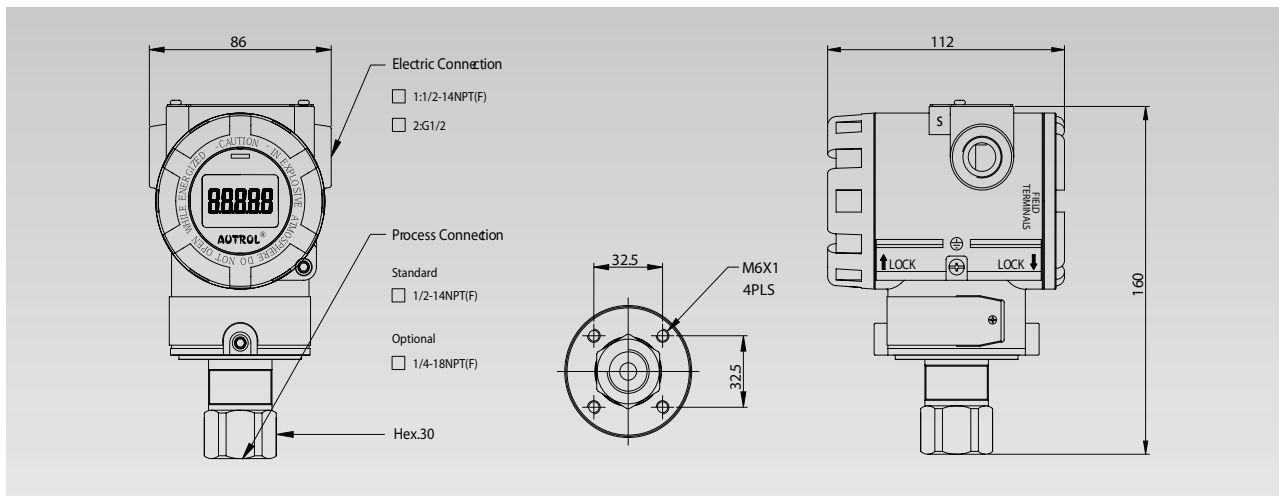
Example: APT3200-G5-M11-K0-1-S-1-M1

Note 1: Request to manufacturer for Draft Range, Absolute (small pressure and vacuum) and Items marked " \* " before order.

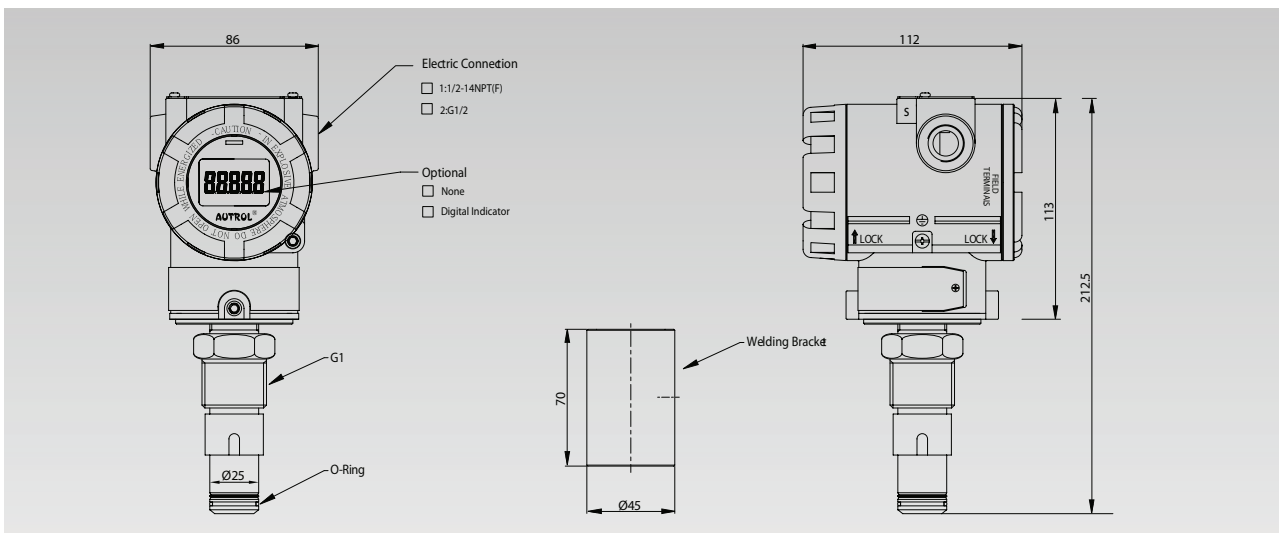


# Dimensions of Transmitter (mm)

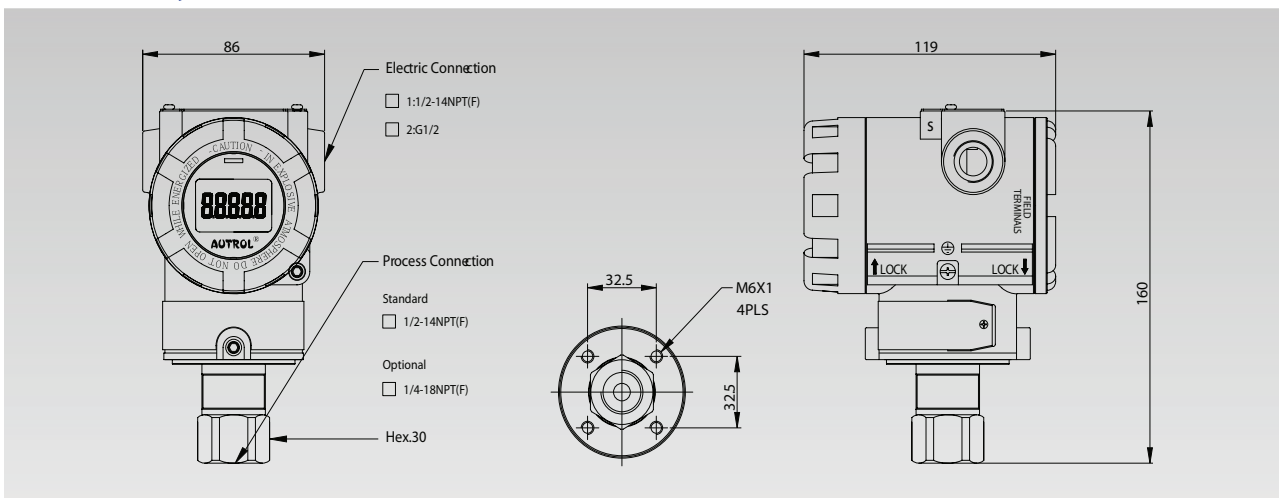
## Standard Model



## Flush Mount Model



## Intrinsically Safe Model



# Customer Service and Support



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