AUTROL® AMERICA
AUTOMATION CONTROL

# APT 3200

## Smart Pressure Transmitter

For Gauge / Absolute Pressure Measurement

PRESSURE


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# APT 3200

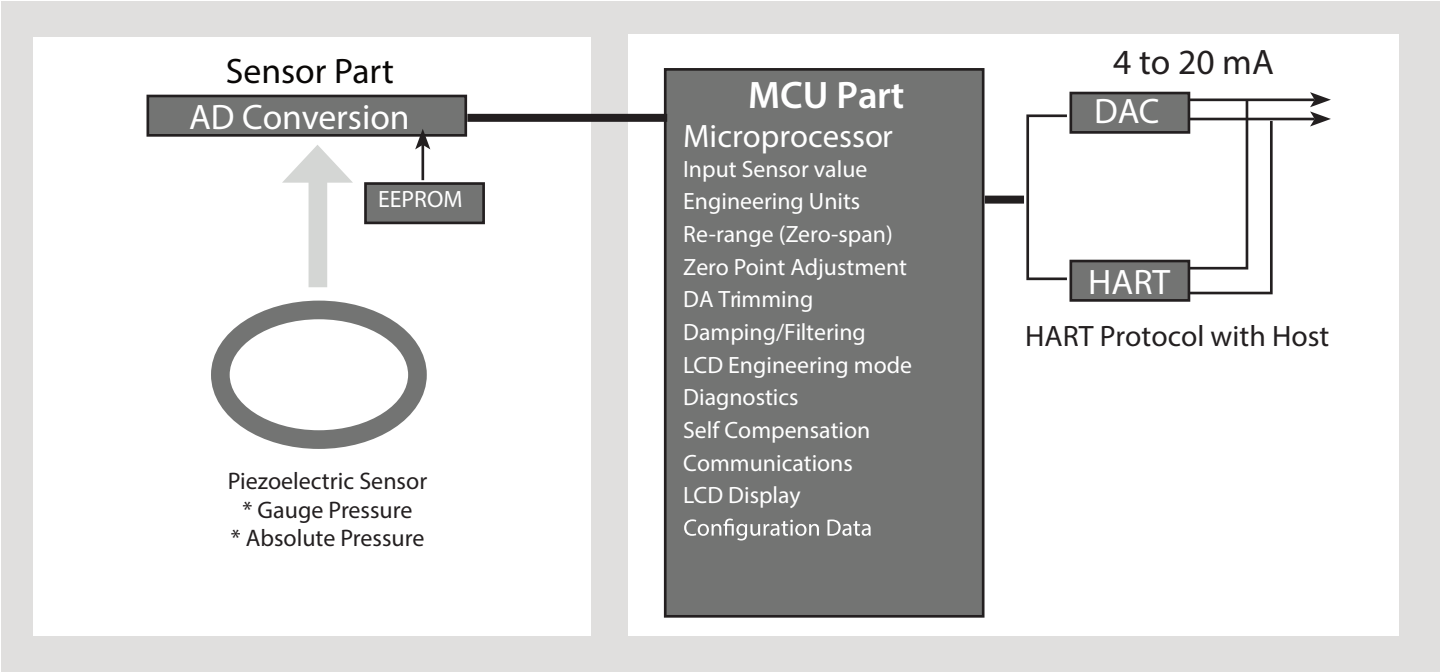
## Introduction


APT 3200 Smart Gauge Pressure Transmitter uses the world's most advance silicon pressure sensor technology and state of the art encapsulation technology. This is a high performance pressure transmitter with HART® communication protocol and is used to measure gauge pressure. It is used to measure liquid, gas, or steam flow as well as liquid level and density of medium. It an accuracy of up to 0.075% of URL and has IP66 water-proof protection.

## 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 : ±0.075% of Calibrated Span (option : ±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 ±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 ≥ 21.1 mA
- Fail Low : Current ≤ 3.78 mA

## Storage Temperature

- -40°C to 85°C (without condensing)

## 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)

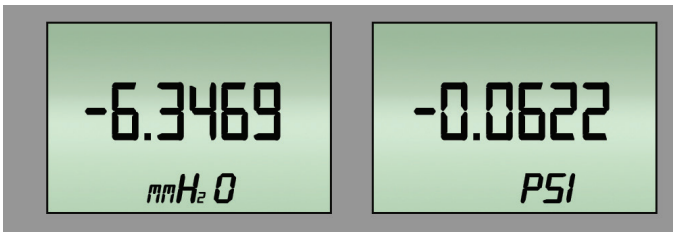
## Working Pressure Limits (silicone oil)

- Model G
  - -15 - 43 psi - # 3
  - -15 - 436 psi - # 4
  - 0 -1,522 psi - # 5
  - 0-5802 psi - # 6
  - 0 - 10878 psi - # 7
- Model A
  - 0-77 psi - # 4
  - 0-436 psi - # 5
  - 0-752 psi - # 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:

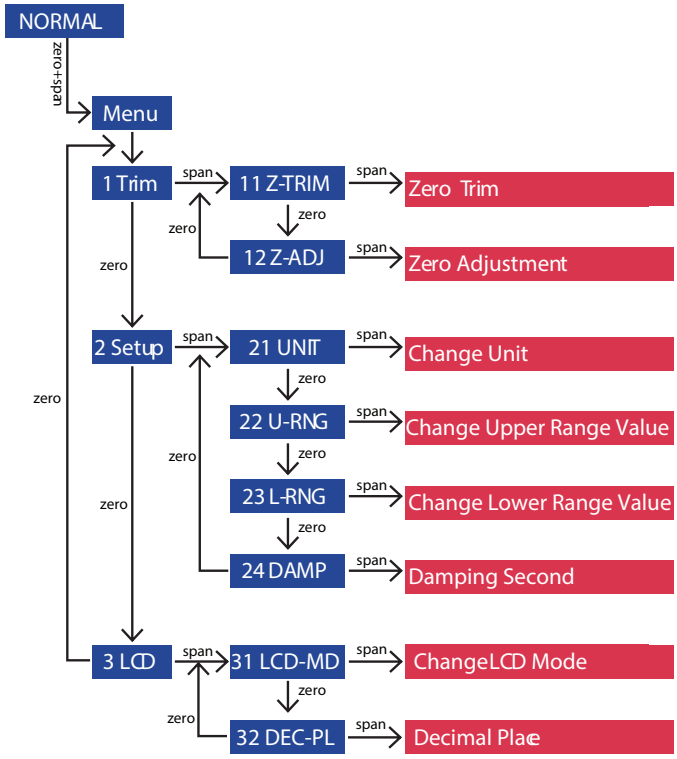
Intrinsic Safety: Ex ia T5 or T4
Ambient Temperature: -40°C to 80°C for T4,
-30°C to 40°C for T5Ui=30Vdc, Ii=200mA, Pi=0.9W, Ci=27nF, Li=104µH
Standards: EN 60079-0 : 2009, EN60079-11: 2007, EN60079-26: 2007

## FM & FM Canada Approvals F1 Code :

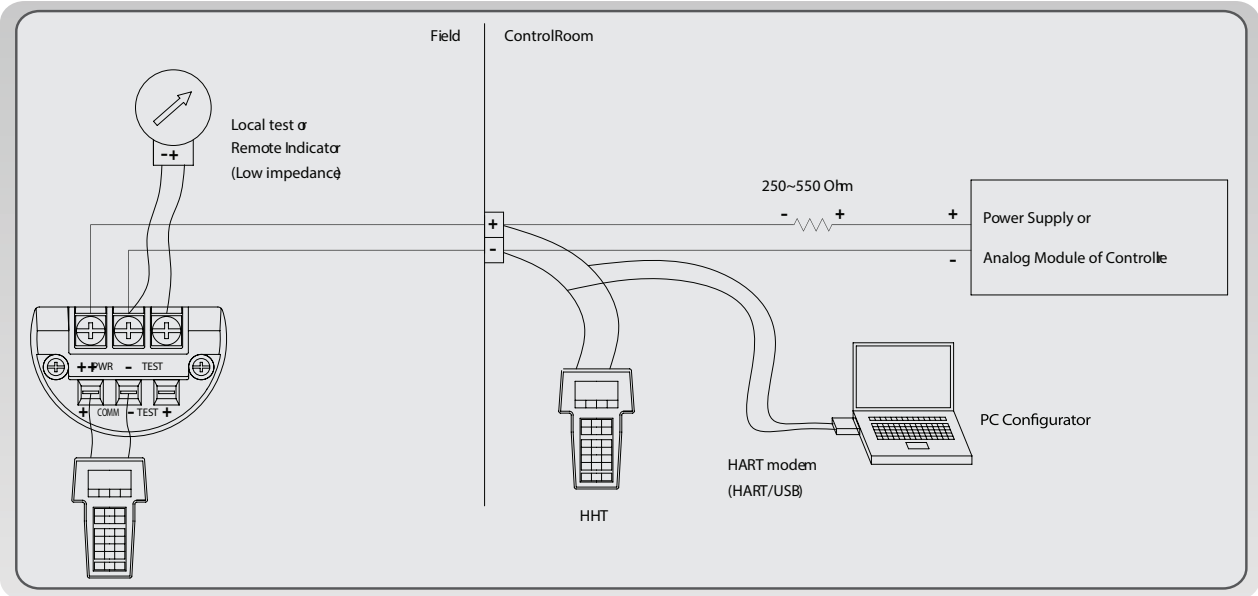
* FM: Factory Mutual explosion proof
* FM Canada: Canadian requirements
Explosion proof for Class I, Division 1
Groups A, B, C and D
Dust-ignition proof for Class II, Division 1,
Groups E, F and G
Dust-ignition proof for Class II, Division 1
"T6, see instruction for temperature code if Process Temperature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

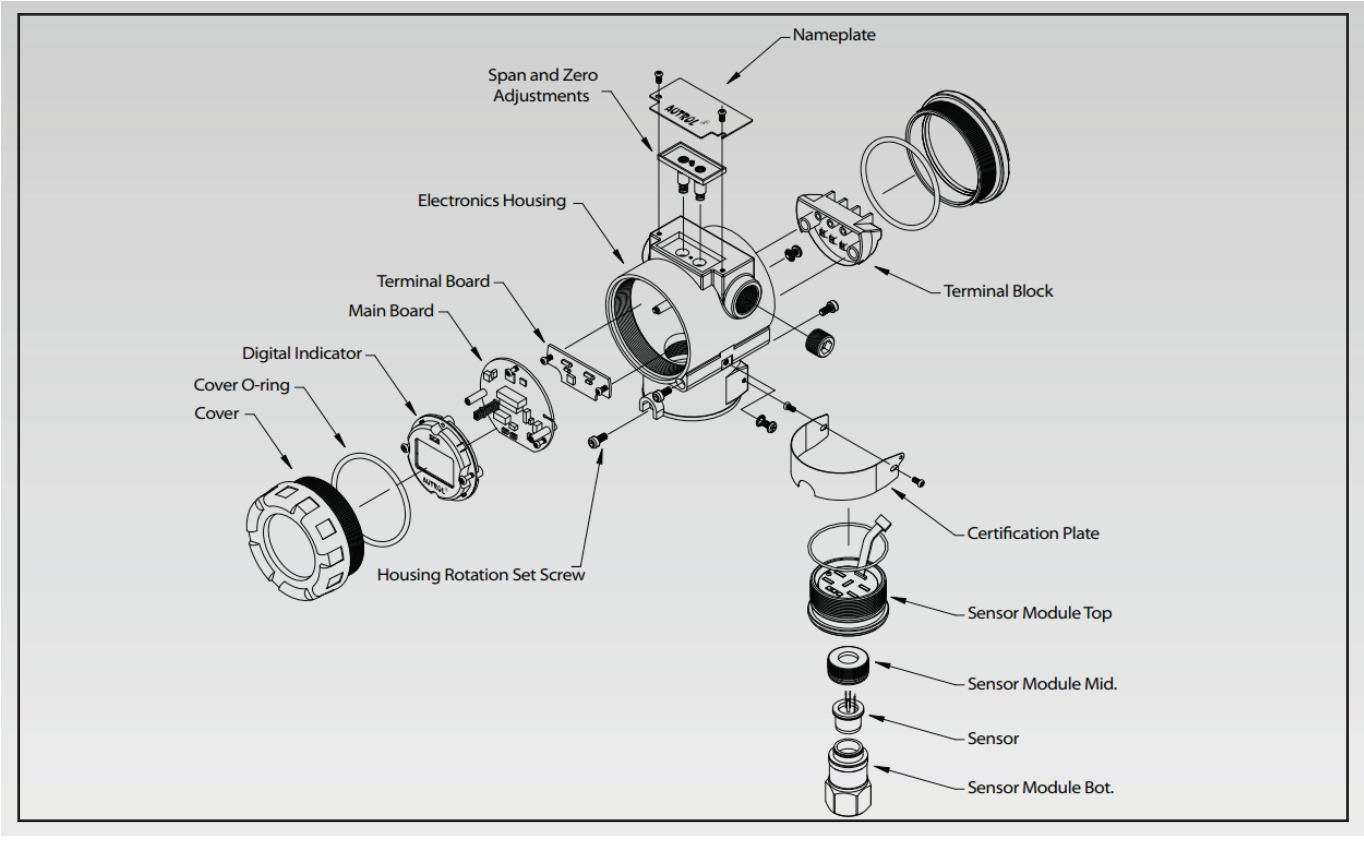


# Connection Diagram of Signal, Power, HHT for Transmitter




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 ±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 (PSI) | Calibrated Span (PSI) |
| **3** | -15 - 150 | 0.2 - 22 | NA | NA |
| **4** | -15 - 218 | 2 - 218 | 0 - 37 | 0.36 - 37 |
| **5** | 0 - 726 | 8 - 726 | 0 - 218 | 2.1 - 218 |
| **6** | 0 - 3626 | 37 - 3626 | 0 - 363 | 4 - 363 |
| **7** | 0 - 8703 | 88 - 8703 | 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)<br>± [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)<br>2.83 kg/6.23 (SS Housing) |
| **Electronic Housing** | Aluminum |
| **Housing Class** | Waterproof (IP67) |

# Ordering Information

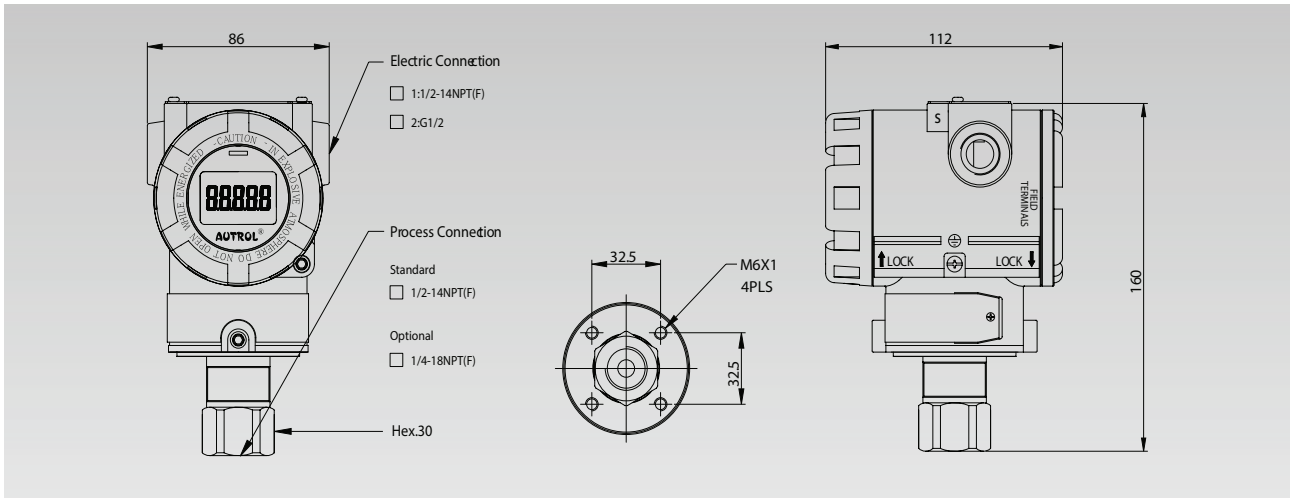
| MODEL | Code | Description | | | | |
|---|---|---|---|---|---|---|
| Type | D | Differential Pressure Transmitter (Static Pressure 13.79 MPa / 2000psi) | | | | |
| | G | Gauge Pressure Transmitter | | | | |
| | A | Absolute Pressure Transmitter | | | | |
| Ranges | | G/F | | A | | |
| | | Range (PSI) | Min. Span (PSI) | Range (PSI) | Min. Span (PSI) | |
| | 3 | -15 - 22 | 0.2 | NA | NA | |
| | 4 | -15 - 218 | 2.1 | 0 - 37 | 0.3 | |
| | 5 | 0 - 726 | 7.2 | 0 - 218 | 2.1 | |
| | 6 | 0 - 3626 | 36.2 | 0 - 363 | 3.6 | |
| | 7 | 0 - 8703 | 87 | 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

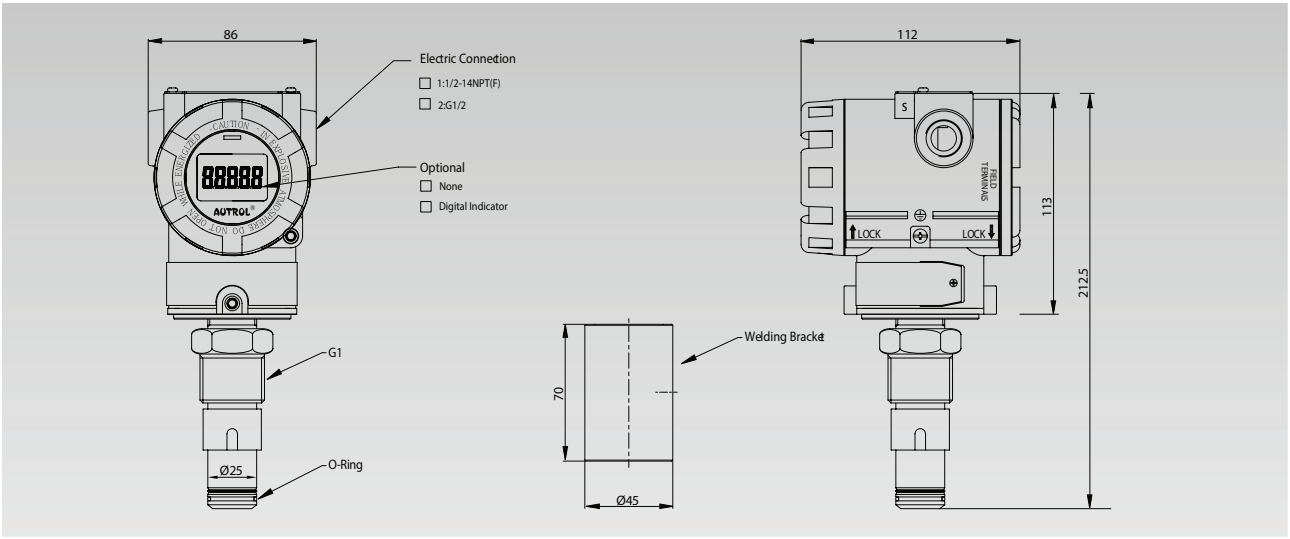
Note 1: Request to manufacturer for Draft Range, Absolute (small pressure and vacuum) and Items marked " * " before order.

# Dimensions of Transmitter (mm)

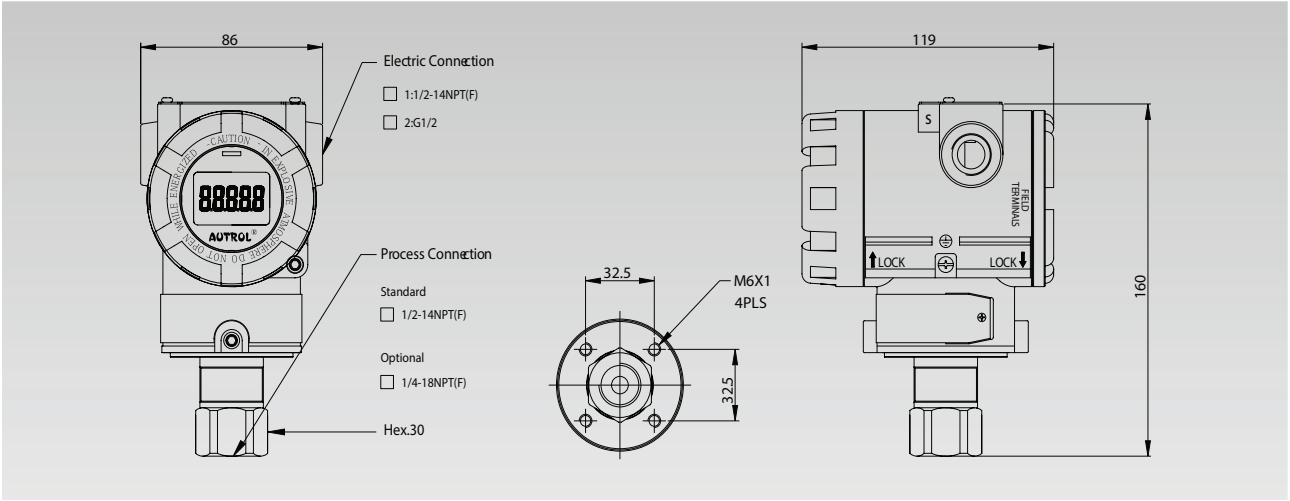
## Standard Model




## Flush Mount Model




## Intrinsically Safe Model



# Customer Service and Support



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