

SMART PRESSURE TRANSMITTER

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)

- Two wire 4~20mA user-configurable for linear or square root output, 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

Transmitters operate on 11.9 to 45 V dc.

* 250 ohm load-- 17.4 Vdc

* Up to a 550 ohm load -- 24 Vdc

Max. Loop Resistance = $(E - 11.9)/0.022$

(E = Power Supply Voltage)

• Supply Voltage

11.9 ~ 45 Vdc -- operation

17.4 ~ 45 Vdc -- HART

Communications

11.9 ~ 42 Vdc -- CSA Approval

• Loop Load

0 ~ 1500 ohm – Operation

250 ~ 550 ohm – HART Communications

EMC Conformity Standards

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

Update Time and Turn-On Time Update

- Time : 0.12 seconds
- Turn-On Time : 3 seconds

Failure Mode

- Fail High : Current \geq 21.75 mA
- Fail Low : Current \leq 3.75 mA

Storage Temperature -40°C to 85°C (without condensing)

Process Temperature Limits

- (Range codes and approval codes may affect limits)
- -40°C to 120°C (-40 to 248 °F)

Isolation

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

Working Pressure Limits (silicone oil)

Model DP & GP	0 ~ 13.79 MPa -----	# 3 ~ 8
Model GP	0 ~ 80.00 MPa -----	# 9
	0 ~ 80.00 MPa -----	# 0
Model HP	0 ~ 3 1.02 MPa -----	# 4 ~ 7
Model AP	0 ~ 700 KPa -----	# 4
	0 ~ 4000 KPa -----	# 5
	0 ~ 7000 KPa -----	# 6

Hydrostatic Test Pressure

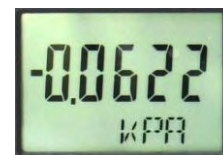
Model DP	3000 psi (20.7 MPa)
Model HP	6750 psi (46.5 MPa)
Model GP	2000 psi (13.8 MPa) -- # 3 ~ 8
	11600 psi (80.0 MPa) --- # 9
	11600 psi (80.0 MPa) --- # 0
Model AP	101.5 psi (700 KPa) --- # 4
	218 psi (4000 KPa) --- # 5
	1015 psi (7000 KPa) --- # 6

Burst Pressure

Model DP, GP & HP	10000 psi (68.9MPa)
Model AP	2000 psi (13.8MPa)

5 Digits LCD

- Expresses all pressure unit and flow unit in 5 digits.
- Select decimal place (0 to 4)



SMART PRESSURE TRANSMITTER

Physical Specifications

Wetted Materials

- Isolating Diaphragms ----316L SST, Monel, Tantalum, HAST-C
- Drain/Vent Valves -----316 SST, HAST-C
- Flanges and Adapters----316 SST, HAST-C
- O-ring -----Viton, PTFE)

Non-wetted materials

- Fill Fluid -----Silicone oil or Inert fill
- Bolts -----Stainless Steel
- Electronics Housing ----Aluminum, Flameproof and Waterproof (IP67)
- Cover O-ring -----Buna-N
- Paint -----Epoxy-Polyester or Polyurethane
- Mounting Bracket -----2-inch Pipe, 304 SST, Painted
- Carbon Steel with 304 SST U-bolt
- Nameplate -----304 SST

Electrical connections

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

Process Connections

- 1/4-18 NPT on 2.126 inch (54.0 mm) centers on flanges for Standard
- 1/2-14 NPT on Process Adapter (option) *Refer to drawing in the last page*

Weight

- 3.9 kg (excluding options)

Hazardous Location Certifications (option)

CSA (Canadian Standards Association) Approvals

C1 Code:

“SEAL NOT REQUIRED”

Explosion proof for Class I, Division 1, Groups A, B, C & D

Dust-ignition proof for Class II, Division 1, Groups E, F & G; Class III

Flameproof for Class I, Zone 1: Ex d IIC

“T6, See Instruction for temperature code if process temperature above 85 °C”

Class I, Division 2, Groups A, B, C, and D;

Class II, Division 2, Groups E, F, G;

Class IIIT4

Non sparking Equipment for Class I Zone 2:

Ex nA IIC T4

Enclosure: Type 4x, IP66

Power Supply: 11.9 to 42 Vdc Max.

Output Signal: 4 to 20 mA + HART

Ambient Temp. : -20 to 60 °C

KOSHA Approvals (KOSHA: Korea Occupational Safety & Health Agency)

K1 Code:

Flameproof for Class I, Zone 1: Ex d IIC T6, IP67

Ambient Temperature: -20 to 60 °C

Max. Process Temperature: 80 °C

Power Supply: Max. 45 Vdc

Output: 4 to 20 mA + HART, Max. 22 mA

KTL Certification (KTL: Korea Testing Laboratory)

K2 Code:

Intrinsic Safety: Ex ia IIC T5

Ambient Temperature: -20 to 60 °C

Max. Process Temperature: Max. 100 °C

Entity Parameter: Umax=40Vdc, IMAX=165mA,

Pmax = 0.9W

FM (Factory Mutual explosion proof) Approvals

F1 Code:

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 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 to 60°C

Enclosure: indoors and outdoors, NEMA Type 4X

ATEX Approvals

E1 Code:

ATEX Certificate number: KEMA07ATEX0103

CE0344  II 2 G Ex d IIC T6 or T5

Operating Temperature: -20°C ≤ Tamb ≤ +60°C

T6 for process < 85°C; T5 for process < 100°C

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General Specifications

(Rangeability: #2=20:1 / #3=50:1 / 4-0=100:1)

1) APT3100 Pressure Sensor Range & URL

Range Code	DP/GP/HP					AP	
	Calibrated Span (KPa)	Upper Range (URL) (KPa)	Lower Range (LRL) (KPa)			Calibrated Span (KPa)	Range (KPa)
			D.P	G.P	H.P		
2	0.075~1.5	1.5	-1.5	-1.5	NA	NA	NA
3	0.15~7.5	7.5	-7.5	-7.5	NA	NA	NA
4	0.373~37.3	37.3	-37.3	-37.3	-37.3	2~250	0~200
5	1.865~186.5	186.5	-186.5	-100	-186.5	10~1500	0~1500
6	6.9~690	690	-690	-100	-690	20~2500	0~2500
7	20.68~2068	2068	-2068	-100	-2068	NA	NA
8	68.95~6895	6895	-6895	-100	NA	NA	NA
9	206.8~20680	20680	NA	-100	NA	NA	NA
0	413.7~41370	41370	NA	-100	NA	NA	NA

Range Code	KPa	Kg/cm ²	bar	psi	inH ₂ O@4°C	mmH ₂ O@4°C	inHg@0°C
2	1.5	0.015	0.015	0.217	6	152	0.442
3	7.5	0.076	0.075	1.087	30	765	2.215
4	37.3	0.38	0.373	5.410	149	3804	11.014
5	186.5	1.902	1.865	27.049	749	19018	55.072
6	690	7.036	6.900	100.073	2773	70361	203.750
7	2068	21.088	20.680	299.930	8310	210878	610.660
8	6895	70.309	68.950	1000.009	27708	703097	2036.025
9	20680	210.876	206.800	2999.303	83105	2108781	6106.597
0	41370	421.856	413.700	6000.211	166085	4218566	12216.550

2) Electrical Specifications

Power Supply	11.9 ~ 45 Vdc	Output Signal	4 ~ 20 mA dc/HART
HART loop resistance	250 ~ 550 ohm	Isolation	500 ms (707 Vdc)

3) Performance Specifications

Reference Supply	± 0.075% of Span (0.1URL ≤ Span ≤ URL) ± [0.025 + 0.005x(URL/Span)]% of Span (0.01URL ≤ Span < 0.1URL)	Ambient Temperature	-40 ~ +85 °C
		LCD Meter Ambient Temp.	-30 ~ +80 °C
		Humidity Limits	5% ~ 100% RH
Ambient Temp. Effect	± [0.019%URL + 0.125% Span] / 28 °C	Process Temperature Limits	-40°C ~ +120 °C
Stability	± 0.125% URL for 12 Months	Power Supply Effects	± 0.005% of Span per Volt
Static Pressure Effects	± 0.1% of URL per 7MPa (Zero Error) ± 0.2% of Reading per 7MPa (Span Error)	Mounting Position Effects	Zero Shift up to 350Pa No Span Effect

4) Physical Specifications

Isolating Diaphragm	316L SST	Process Connection Size	1/4 - 18 NPT
Drain & Vent Valve	316 SST	(Adapter – Option)	1/2 – 14 NPT
Flange & Adapter	316 SST	Electrical Connections	1/2 – 14 NPT with M4
O-ring	Viton, PTFE	Weight (excluding Option Items)	3.9 Kg
Electronic Housing	Aluminum	2" Pipe Stanchion Type bracket	Angle or Flat type
Bolts & Bolting Flange	304 SST	Housing Class	Waterproof (IP67), 4X, IP66

5) Hazardous Location Certifications (option)

Korea Standards Approval	Overseas Standards Approval
Flameproof Approval : Ex d IIC T6 (KOSHA) Intrinsic Safety Approval : Ex ia IIC T5 (KTL)	CSA Explosion proof Approval FM Explosion proof Approval ATEX Flame proof Approval

For application support, quotations, pricing and lead times please contact our sales department directly at sales@autroltransmitters.com. Additional details including product technical specifications can be found online at www.autroltransmitters.com

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APT 3100 Configuration Sheet

Model	Code	Description					
APT3100	D	Differential Pressure Transmitter (Static Pressure 13.79 MPa / 2000psi)					
	G	Gauge Pressure Transmitter					
	H	Differential Pressure Transmitter for High Line Pressure (Static Pressure 31.02MPa / 4500psi)					
	A	Absolute Pressure Transmitter					
Ranges		DP/GP/HP				*AP	
		Calibrated Span Min. to Max	Lower Range Limit			Upper Range Limit	Range
			APT3100-D	APT3100-G	APT3100-H	APT3100-A	
	2	0.075 ~ 1.5 Kpa (0.302~6.022 inH2O)	-1.5 Kpa (-6.022 in H2O)	-1.5 Kpa (-6.022 in H2O)	NA	1.5 Kpa (6.022 in H2O)	NA
	3	0.15 ~ 7.5 Kpa (0.6~30 inH2O)	-7.5 Kpa (-30 inH2O)	-7.5 Kpa (-30 inH2O)	-7.5 Kpa (-30 inH2O)	7.5 Kpa (30 inH2O)	NA
	4	0.373 ~ 37.3 KPa (1.5~150 in H2O)	-37.3 KPa (-150 inH2O)	-37.3 KPa (-150 inH2O)	-37.3 KPa (-150 inH2O)	37.3 KPa (150 inH2O)	0~200 KPa
	5	1.865 ~ 186.5 KPa (7.5~750 inH2O)	-186.5 KPa (-750 inH2O)	-100KPa (-14.6 psi)	-186.5 KPa (-750 inH2O)	186.5 KPa (750 inH2O)	0~1500 KPa
	6	6.9 ~ 690 KPa (1~100 psi)	-690 KPa (-100 psi)	-100KPa (-14.6 psi)	-690 KPa (-100 psi)	690 KPa (100 psi)	0~2500 KPa
	7	20.68 ~ 2068 KPa (3~300 psi)	-2068 KPa (-300 psi)	-100KPa (-14.6 psi)	-2068 KPa (-300 psi)	2068 KPa (300 psi)	NA
	8	68.95 ~ 6895 Kpa (10~1000 psi)	-6695 KPa (-1000 psi)	-100KPa (-14.6 psi)	NA	6895 Kpa (1000 psi)	NA
	9	206.8 ~ 20680KPa (30~3000 psi)	NA	-100KPa (-14.6 psi)	NA	20680 KPa (3000 psi)	NA
	0	413.7 ~ 41370 KPa (60~6000 psi)	NA	-100KPa (-14.6 psi)	NA	41370 KPa (6000 psi)	NA
	X	Special					
Mounting Flange/ Material		Body	Vent Plug		Diaphragm		
	M11	316 SST	316 SST		316L SST		
	M12	316 SST	316 SST		HAST - C		
	M13	316 SST	316 SST		Monel		
	M14	316 SST	316 SST		Tantalum		
	M21	HAST-C	HAST-C		HAST - C		
	M22	HAST-C	HAST-C		Monel		
M23	HAST-C	HAST-C		Tantalum			
Approvals	K0	Maker Standard (Waterproof : IP67)		E1	ATEX(KEMA) Flameproof		
	K1	KOSHA Flameproof Approval : Ex d IIC T6		*E2	ATEX(KEMA) Intrinsic Safety		
	*K2	KTL Intrinsic Safety Approval : Ex ia IIC T5		F1	FM/FMC Explosion proof for (USA & Canada)		
	*F2	FM Intrinsic Safety					
Fill Fluid	1	Silicone (DC200)		*2	Inert fill fluid (Halocarbon Oil)		
Process Connection	S	1/4 - 18 NPT (Standard)		O	1/2 - 14 NPT Female Adapter)	X Special	
Electrical Connection	1	1/2-14NPT Epoxy-Polyester Painted Aluminum		2	G1/2 Epoxy-Polyester Painted Aluminum	X Special	
Option	M1	LCD Indicator(5digit)					
	MP	Multi-Planar					
	LP	Lighting Protector (Internal Type)					
	K	Oil Free Finish					
	F1	Side Vent / Drain Top					
	F2	Side Vent / Drain Bottom					
	2W	2 Way Manifold (SST)					
	3W	3 Way Manifold (SST) Add Remark "Remote Type"					
	5W	5 Way Manifold (SST) Add Remark "Remote Type"					
	BA	Stainless Steel Bracket (Angle type) with SST Bolts					
	BF	Stainless Steel Bracket (Flat type) with SST Bolts					
	ST	Stainless Steel (SUS 316) Housing					
T	Teflon O-Ring (Wetted Part)						

Example: APT3100-D5-M11-C1-1-S-1-M1-W-BA

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

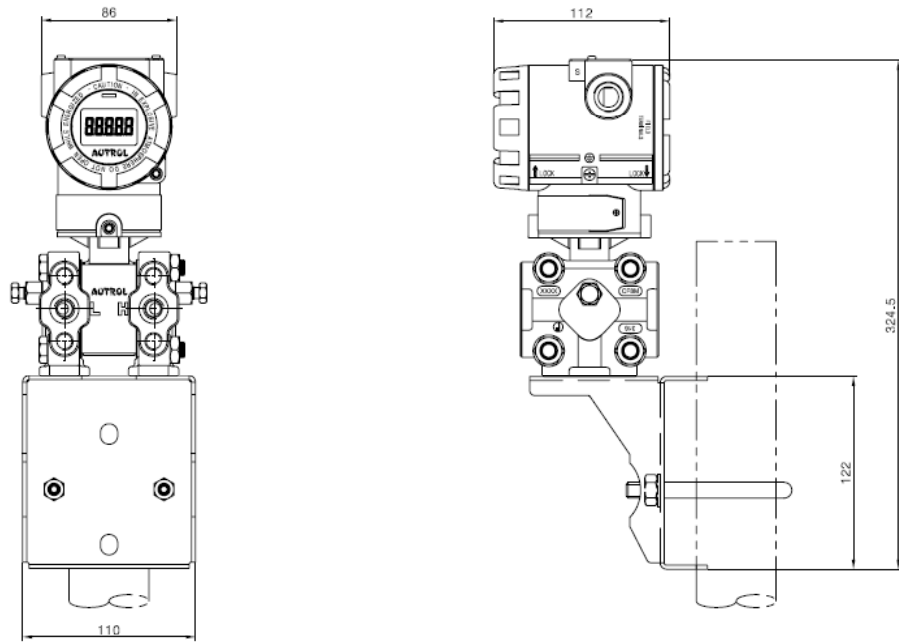
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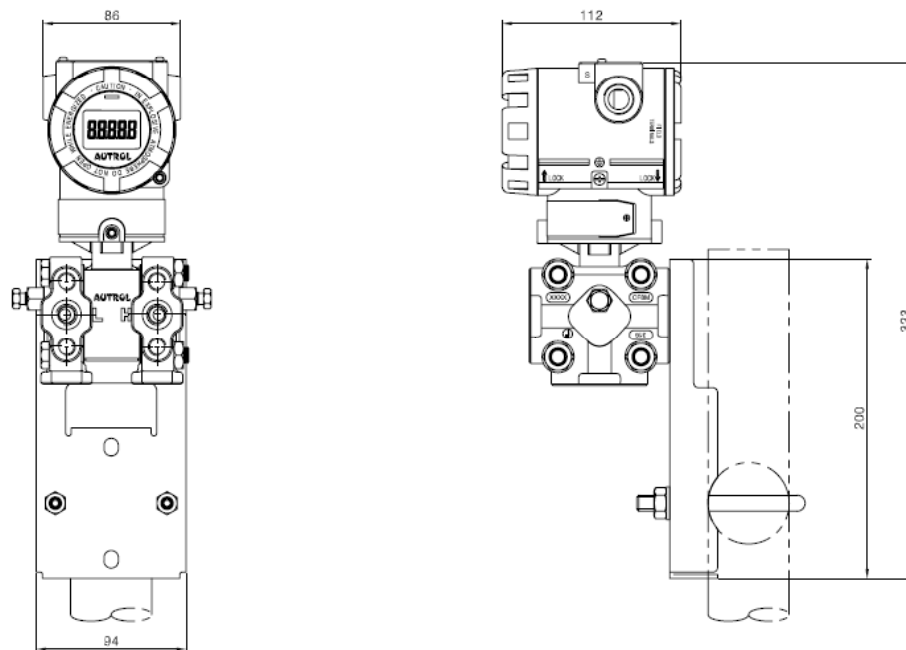
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Installation with mounting bracket

2" Pipe Mounting Bracket Model Angle Type

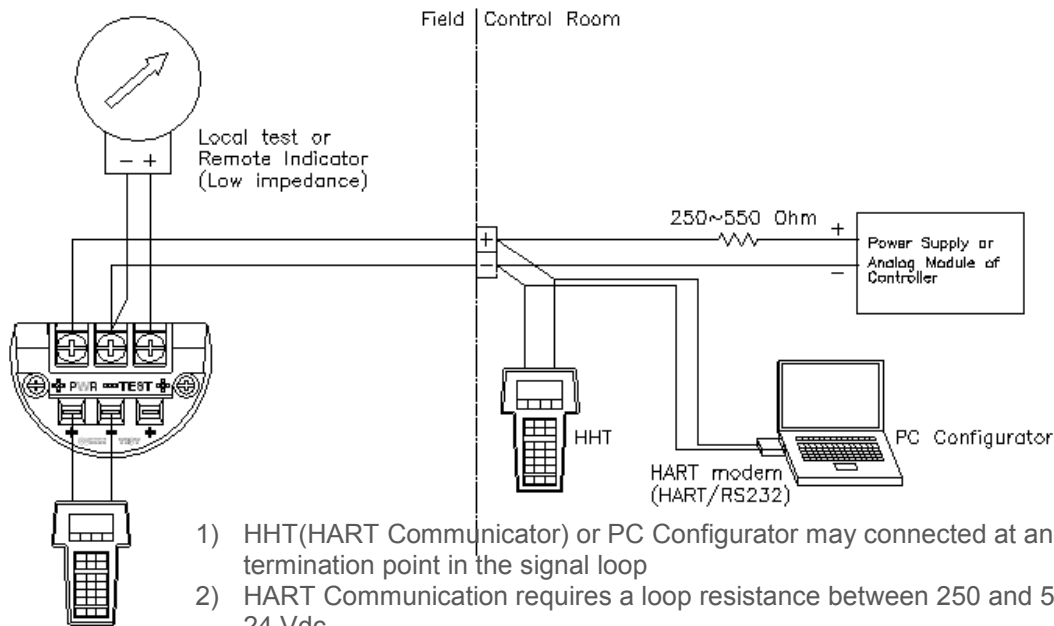


2" Pipe Mounting Bracket Model Flat Type



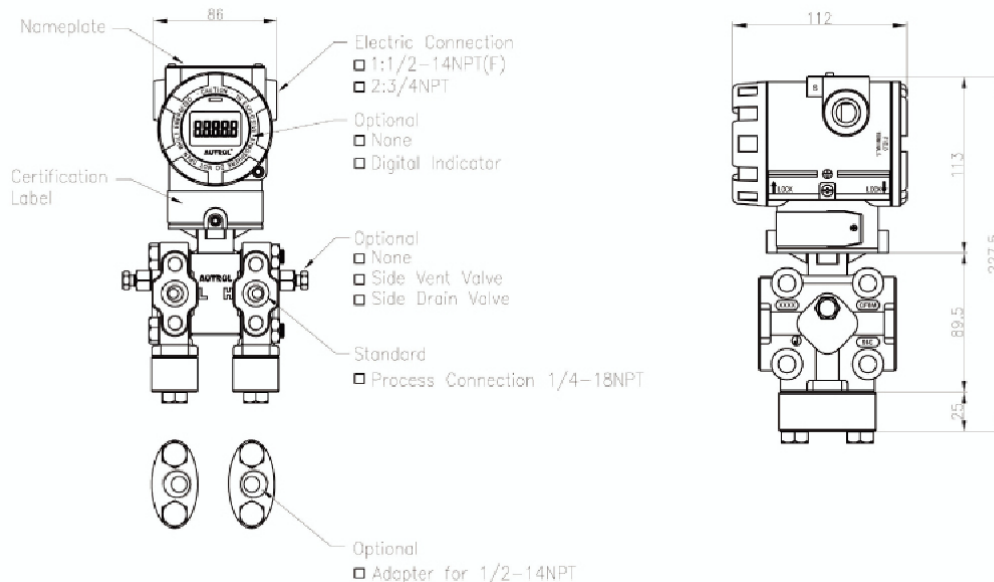
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Connection Diagram of Signal, Power, HHT for Transmitter



- 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) Transmitter operates on 11.9 to 45.0 Vdc transmitter terminal voltage. [Applied Power]
 - * 11.9 ~ 45.0 Vdc for General Operation
 - * 17.4 ~ 45.0 Vdc for HART Communication
 - * 17.4 ~ 42.0 Vdc for CSA Approval (Power supply must not exceed 42.0 Vdc)

Dimensions of Transmitter (mm)



SMART PRESSURE TRANSMITTER

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