AUTROL America
SMART TRANSMITTERS

ATT2100/2200

SMART TEMPERATURE TRANSMITTER

Performance Specifications

Reference Accuracy
(Refer to Table 1)

Stability
RTDs.
±0.125 of reading or 0.15°C, whichver is greater, for 24 months

Thermocouples
±0.125 of reading or 0.15°C, whichver is greater, for 24 months

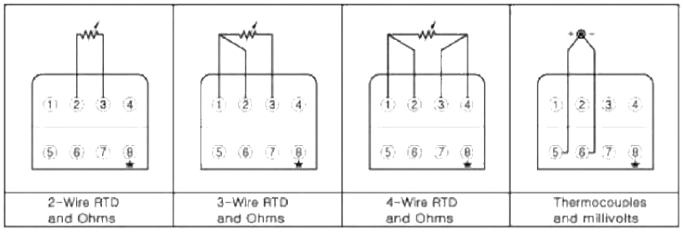
Repeatability
±0.05% of span
Ambient Temperature Effect
(Per 1°C change in ambient temperature.)

Sensor Type	Digital Accuracy	D/A effect
2W, 3W, 4Wire RTD		
Pt 100(a=0.00385)	0.003°C	0.002% of Span
Pt 100(a=0.003916)		
Thermocouple		
NIST Type B	0.046°C	0.002% of Span
NIST Type E,J,K,N	0.005°c +0.00054% Of reading	
NIST Type R,S,T	0.015°C If reading ≥200°C 0.021°C – 0.0032% of reading if not	

Power Supply Effect
Less than ±0.005% of Span

Update Time and Turn On Time
Update Time: 0.5 Seconds
Turn-On Time: 5 Seconds

Failure Mode
The value to which the transmitter drives
Its output in failure is as follows
Fail High: Current≥ 21.1 mA
Fail Low: Current≥ 3.78 mA



Function Specifications

Range and Sensor Limits
(Refer to Table 1)

Zero and Span Adjustments Limits
- Zero and span values can be set any where within the range limits stated in Table 1.
- Span must be greater than or equal to the minium span stated in Table 1

Output (Analog current and Digital Data)
Two wire 4~20mA, Digital process, Digital Process valve 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. With 250 ohm load, 17.4 Vdc power supply is required with 24 Vdc Supply, up to a 550 ohm load can be used
Max. Loop Resistance = (E-11.9) / 0022
(E = Power Supply Voltage)

Supply Voltage
11.9 to 45 Vdc for Operation
17.4 to 45 Vdc for HART Communications

Loop Load
0 to 1500 Q for Operation
250 to 550 Q for HART Communications

Ambient Humidity Limits
5% ~ 100%RH (Relative Humidity)

Ambient Temperature Limits
- -40°C ~ 85°C (without condensing for ATT2100)
- -20°C ~ 85°C (without condensing for ATT2200)
- -30°C ~ 80°C (with LCD module)

Storage Temperature
- -40°C ~ 85°C (without condensing)
- -20°C ~ 85°C (without condensing for ATT2200)

Isolation
Input/ output isolated to 500Vms (707Vdc)

ATT2200 Transmitter Field Wiring and Sensor Wiring Diagrams

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Physical Specification

Electrical Connections
½-14 NPT conduit with M3.5 Screw Terminals

Materials of Construction
Electronics Housing: Low-copper aluminium
Flame proof and Waterproof (IP67)
Paint: Epoxy-Polyster or Polyurthane
Cover 0-ring: Buna-N
Mounting Bracket: 2-inch Pipe, 304 SST,
Painted Carbon Steel with 304 SST U-bolt
Nameplate: 304 SST

Weight
1.2 kg below (excluding options)

Hazardous Location Certifications (Option)

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

K1 Code:
Flame proof for class 1, Zone 1: Ex d цC T6, IP67
Ambient Temperature: -20 to 60°C
Power Supply: Max.45 Vdc
Output: 4 to 20 mA + HART, Max.22mA

KTL Certification
(KTL: Korea Testing Laboratory)

K2 Code:
Intrinsic Safety: Ex ia ц C T5
Ambient Temperature: -20 to 60°C
Enity Parameter: Umax = 40Vdc
IMAX = 165 mA, max = 0.9W

FM (Factory Mutual explosion proof) **Approvals**
F1 Code

Explosion proof for Class 1, Division 1
Groups A, B, C, and D
Dust-ignition proof for class ц, Division 1
Groups E, F, and G
Dust-ignition proof for class ц, 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 1, Division 2,
Groups A, B, C & D; Class ц, Division 2,
Groups E, F, G; and Class ш, 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: KEMA08ATEX
CE 0344 ц 2 G Ex d цC T6, T5 or T4
Operating Temperature: -20°C≤ Tamb ≤+60°C
T6 for process ≤ 85°C; T5 for process ≤+100°C
T4 for process ≤+135°C

EMC Conformity standards

a) EMI(Emission) – EN50081-2:1993				
Test Item			Frequency Range	Basic Standard
1	Applicable Electromagnetic Radiation Disturbances		30~1000MHz	EN55011:1988 (Class A Group)
b) For EMS(Immunity) – EN50082-2:1995				
	Test Item	Test Specification	Basic Standard	Performance Criteria
1	Electrostatic Discharge	±4KV (Contact) ±8KV(air)	EN61000-4-2 :1995A +A1 : 1998	A
2	Radio Frequency Electromagnetic Field Amplitude Modulated	80 MHz ~ 1GHz 1KV,80%AM	EN61000-4-3 :1996A ENV50204 : 1995	A
3	Radio Frequency Electromagnetic Field Pulse Modulated	900 MHz ±5MHz,A 10V/m , 200Hz 50% Duty Cycle PM		A
4	Electrical Fast Transients /BurstImmunity	±2KV (power line) 5KHz / 15ms /1minute	EN61000-4-4 :1995A	A
5	Immunity to conducted Disturbance Induced by Radio Frequency Fields	150KHz ~ 80MHz 10V/m,80%AM (1KHz)	EN61000-4-6 :1995A	A

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General Specifications

1. Temperature Range and Sensor Accuracy

Sensor Type	Sensor Reference	Input Range	Minimum Span	Digital Accuracy	D/A Accuracy Of Span
2W,3W, 4Wire RTD					
Pt-100	KSC 1603-1991 (a=0.00385)DIN	200 ~ 650°C	15°C	±0.17°C	±0.17°C
Pt-100	KSC 1604-1981 (a=0.00391)	200 ~ 500°C		±0.16°C	
Thermocouple					
NIST Type B	KSC 1602-1982	100 ~ 1820°C	25°C	±0.77°C	±0.17°C
NIST Type E		-200 ~ 1000°C		±0.20°C	
NIST Type J		-200 ~ 1200°C		±0.25°C	
NIST Type K		-200 ~ 1350°C		±0.35°C	
NIST Type N		-200 ~ 1300°C		±0.40°C	
NIST Type R		0 ~ 1760°C		±0.60°C	
NIST Type S		0 ~ 17400°C		±0.50°C	
NIST Type T		-200 ~ 4000°C		±0.25°C	
Millivolt Input		-10 ~75mV	2mV	±0.012mV	
Ohm Input		0 ~ 4302	20Q	±0.35Q	

{Note} 1) RTD input : a=0.00385 : KS, JIS, DIN, IEC, A=0.00391 : US
2) Thermocouple input : KSC 1602-1982, JISC 1602-1982, ANSI MC96.1-1982

Ambient Temperature Effects(per1°C change in Ambient temperature)			
Sensor Type		**Digital Accuracy**	**D/A effectper**
RTD 2W,3W,4-Wire	Pt 100(a=0.00385)	0.003°C	0.002% of Span
	Pt 100(a=0.003916)		
Thermocouple	NIST Type B	0.046°C	
	NIST Type E,J,K,N	0.005°C+0.00054% of reading	
	NIST Type R,S,T	0.015°C If reading	
		0.021°C-0.0032% Of reading if not	

2. Electrical Specifications

Power Supply	11.9~ 45Vdc	**Output Signal**	4 ~ 20 mA/HART
HART loop resistance	250~550 Ohm (24 Vdc)	**Isolation**	500 Vrms (707 DC)

3. Performance Specifications

Accuracy	Refer to item No.1	Operating Temperature	-40 ~ +85°C
Stability for 2 year	±0.1% o Reading or 0.1°C whichever is greater	LCD Meter Operating Temp.	-30 ~ +80°C
Ambient Temp. Effect	±0.05% of Span/10°C	Humidity Limits	5% ~ 98% RH
Repeatability	±0.05% of Span	Power Supply Effects	±0.005% of Span/V

4. Physical Specification (for ATT2100)

Electrical Connections	½-14NPT(w/M3.5)	**Weight(excluding Option items)**	1.5Kg below
Electronics Housing	Aluminium	**2" Stanchion Type Bracket**	Angle or Flat Type
O-rings	Buna-N	**Housing Class**	Waterproof(IP67)

5. Hazardous Location Certifications-Option (ATT2100)

Korea Standards Approval	Overseas Standards Approval
Flame proof Approval: Exd цC T6 (KOSHA) Intrinsic Safety Approval: Exia цC T5 (KTL)	FM Explosion proof Approval ATEX Flame proof Approval

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ATT2100/2200 Configuration Sheet

Model No.	Code	Description
ATT2100	S	Single Element
	D	Dual Elements
Housing Materials and Electrical Connection Size	1	½-14NPT Epoxy Coated-Alminium
	2	G1/2 Epoxy Coated-Alminium
	X	Special
Hazardous Location Certifications	K0	Maker Standard(Waterproof : IP67)
	K1	KOSHA Flameproof Approval : ExdцC T6
	K2	KTL Intrinsic Safety Approval : ExdцC T5
	•E1	CENELEC(KEMA) Flame proof
	•E2	CENELEC(KEMA) Intrinsic Safety
	F1	FM /FMC Explosion proof for USA & Canada
	•F2	FM Intrinsic Safety -
Local Indicator (Meter) Temperature Sensor, Thermowell	M1	LCD Indicator - -
	ST	Stainless Steel (SUS 316) Housing
	BA	Stainless Steel Bracket(Angletype) with SST Bolts
	BF	Stainless Steel Bracket(Flat type) with SST Bolts
	X1	Assembly Option(Element/Well)

Example: ATT2100-S-1-K1-M1
Note: Request to manufacture for items marked••• before order

Model No.	Code	Description
ATT2200	S	Single Element
	•D	Dual Element (Special Order, Request to manufacture if necessary)
Housing Materials	1	Plastic
	X	Special
Hazardous Locations Certifications	K0	Maker Standard
	•K2	KTL Intrinsic Safety Approval : ExdцC T5
Connection Type	L2	Two wires
	L3	Three Wires
	L4	Four Wires
Sensor Type	C1	Custom Calibration
	R1	RTD (Pt 100 ohm)
	R2	Resister
	M1	Milli-volt
	TM	Thermocouple Type (X: B,E,J,K,N,R,S,T)
Sensor Fail Mode	D	Downscale
	U	Upscale

Example: ATT2200-S-1-K0-L2-C1-D
Note: Request to manufacture for items marked••• before order

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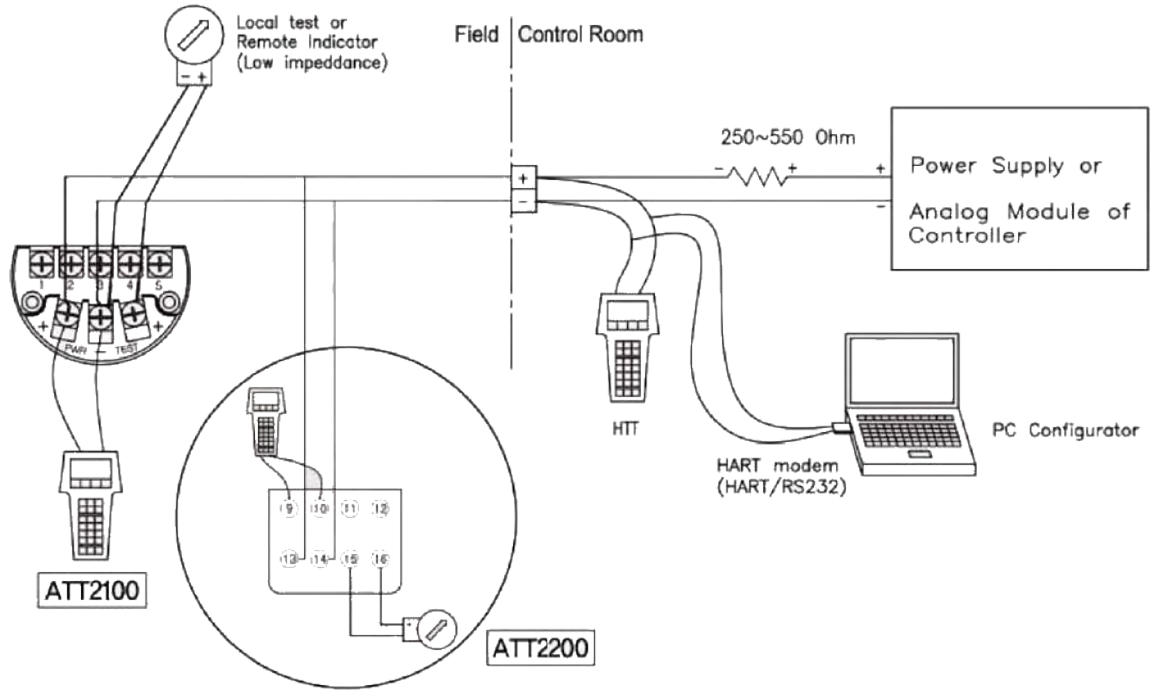
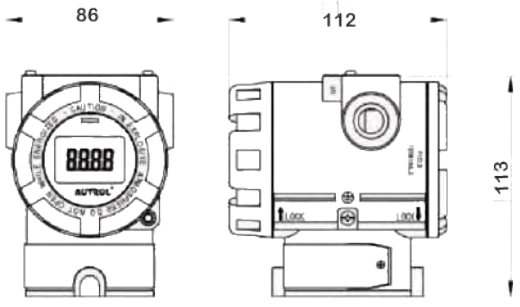
Connection Diagram of Signal, Power, HHT for Transmitter



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 @24Vdc.
3. Transmitter operates on 11.9 to 45.0 Vdc transmitter terminal voltage.[Applier Power]
   - 11.9~45.0 Vdc for General Operation
   - 17.4~45.0 Vdc for HART Communication

Dimensions of Transmitter (mm)

ATT2100



ATT2200