Temperature Transmitters with HART Protocol

■ Features

- HART protocol
- Display rotation in 330 ° range
- Better visibility with supporting backlight function
- Various inputs (to order, select one from 22 kinds)
  - RTD 8 types
  - Thermocouple 8 types
  - mV 8 types
  - Resistor 2 types
- Explosion-proof specification: Ex D IIC T6
- Protection structure: IP67 (IEC standard)

Please read "Safety Considerations" in the instruction manual before using.

HART® FIELD COMMUNICATIONS PROTOCOL

■ Ordering Information

KT — 502H 0 (-270 to 1372, K)※1

① ②

Item	Description			
①Mounting bracket	0	Without bracket	1	With bracket
②User temperature range	※1: To order this unit, write the temperature sensor type and the temperature range.			

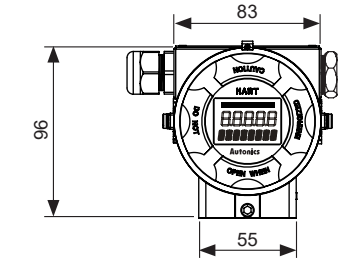
■ Specifications

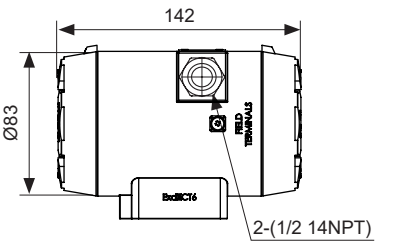
Model		KT-502H
Power supply		10.5-45VDC⎓ (with backlight LCD)
Display method		PV display part: 7-segment 5-digit (character size: W4×H8mm), Parameter display part: 14-segment 8-digit (character size: W2.6×H4.8mm), 52-bar meter
Display range		-19999 to 99999
Setting method		HART-protocol (no setting key)
Response time		1 sec
Input type	RTD	DPt100Ω, DPt500Ω, DPt1000Ω, Ni100Ω, Ni500Ω, Ni1000Ω, Cu50Ω, Cu100Ω
	Thermocouple	K, J, T, E, N, S, B, R
	Resistance transmission (Ω)	0 - 400Ω, 0 - 2000Ω
	Voltage transmission (mV)	−10 - 75mV, −100 - 100mV, −100 - 500mV, −100 - 2000mV
Output		DC4-20mA (2-wire)
Accuracy		±0.3%
Alarm		Below 3.8mA, Over 20.5mA/Sensor break 3.6mA
Load		Max.(V power supply - 7.5V)/0.22A
Galvanic insulation		2,000VAC (input/output)
Environment	Ambient temperature	-20 to 70℃, storage: 20 to 80℃
	Ambient humidity	0 to 85%RH, storage: 0 to 85%RH
Explosion class※1		Ex d IIC T6
Protection structure		IP67 (IEC standard)
Material		Body: Aluminum (AlDc.8S), Cover O-Ring: Buna N
Weight※2		Approx. 1.4kg (approx. 1.2kg)

※1: The explosion class specification is acquired and managed by KONICS.
※2: The weight includes packaging. The weight in parenthesis is for unit only.
※Environment resistance is rated at no freezing or condensation.

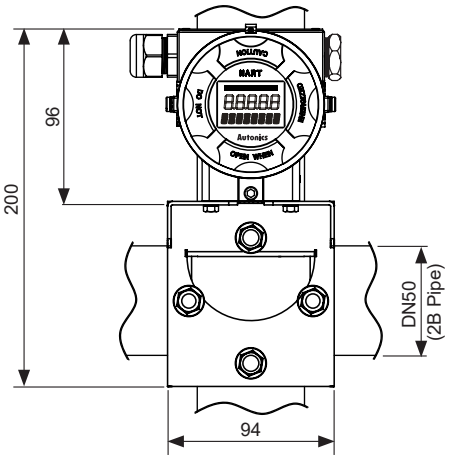
▣ Dimensions

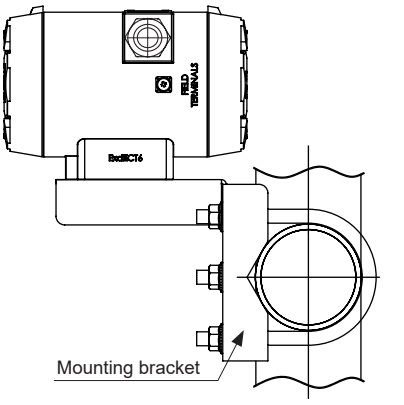
(unit: mm)





● **Mounting bracket**

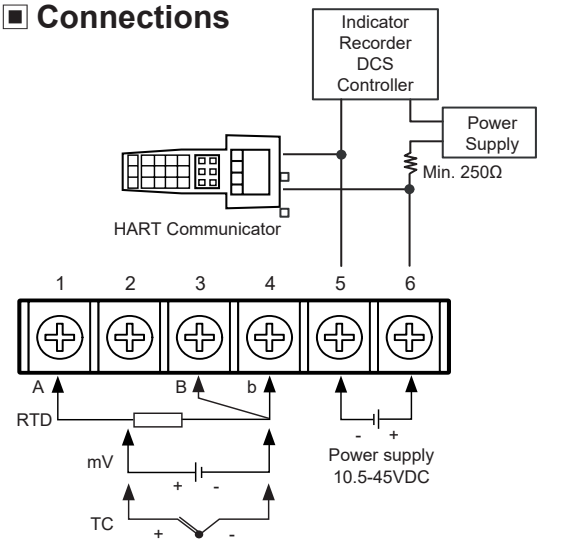




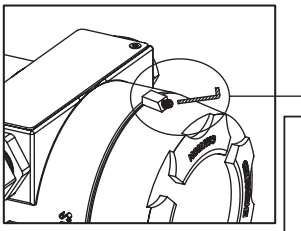
▣ Input Type and Range

Input type		Input range(℃)	Input range(℉)
RTD	DPt100Ω	−200 to 850	−328 to 1562
	DPt500Ω	−200 to 250	−328 to 482
	DPt1000Ω	−200 to 250	−328 to 482
	Cu50Ω	−50 to 150	−58 to 302
	Cu100Ω	−50 to 150	−58 to 302
	Ni100Ω	−60 to 180	−76 to 356
	Ni500Ω	−60 to 180	−76 to 356
	Ni1000Ω	−60 to 150	−76 to 302
Resistance transmitter	Resistance (Ω)	0 to400Ω	—
		0 to2000Ω	
Thermocouple	B (PtRh30-PtRh6)	0 to 1820	32 to 3308
	E(NiCr-CuNi)	−270 to 1000	−454 to 1832
	J(Fe-CuNi)	−210 to 1200	−346 to 2192
	K(NiCr-Ni)	−270 to 1372	−454 to 2501.6
	N(NiCrSi-NiSi)	−270 to 1300	−454 to 2372
	R(PtRh13-Pt)	−50 to 1768	−58 to 3214.4
	S(PtRh10-Pt)	−50 to 1768	−58 to 3214.4
	T(Cu-CuNi)	−270 to 400	−454 to 752
Analog	Voltage	−10 - 75mV	—
		−100 - 100mV	
		−100 - 500mV	
		−100 - 2000mV	

▣ Connections



● **Opening cover**



To open the cover, unscrew the M3×6L headless bolt using a 1.5 hexagon wrench and rotate the cover.

■ Current Trim Adjustment

Connect a HART communicator and adjust current trim as below by a HART communicator.

① Select the **'1. Device Setup'** by ↑, ↓ keys and press the → key.

1. Device Setup
2. PV
3. PV Ao
4. PV LRV
5. URV

② Select the **'2. Diag/Service'** by ↑, ↓ keys and press the → key.

1. Process Variables
2. Diag/Service
3. Basic Setup
4. Detailed Setup
5. Review

③ Select the **'4. D/A trim'** by ↑, ↓ keys and press the → key.

1. Test device
2. Loop test
3. Calibration
4. D/A trim

④ Press the O K (F4) key.

WARN-Loop should be removed from automatic control
ABORT | O K

⑤ Press the O K (F4) key.

Connect reference meter
ABORT | O K

⑥ Press the O K (F4) key.

Setting fid dev output to 4mA
ABORT | O K

⑦ Press the ENTER (F4) key to set 4 mA display value.

Enter meter Value
4.000
HELP | DEL | ABORT | ENTER

⑧ If output display value is correct, select **'1. Yes'** and press the ENTER (F4) key. If not, select **'2. No'** and press the ENTER (F4) key and re-set the display value.

Ex)If output display value is 3.89mA, select 3.89 and press the ENTER (F4) key.

Fid dev output 4.000 mA equal to reference meter ?
1. Yes
2. No **ABORT | ENTER**

⑨ Press the O K (F4) key.

Setting fid dev. output to 20mA
ABORT | O K

⑩ Press the ENTER (F4) key to set 20 mA display value.

Enter meter Value
20.000
HELP | DEL | ABORT | ENTER

⑪ If output display value is correct, select **'1. Yes'** and press the ENTER (F4) key. If not, select **'2. No'** and press the ENTER (F4) key and re-set the display value.

Fid dev output 20.000 mA equal to reference meter ?
1. Yes
2. No **ABORT | ENTER**

⑫ Press the O K (F4) key.

NOTE-Loop may be returned to automatic control
ABORT | O K

⑬ Press the HOME (F3) key.

Diag/Service
1. Test device
2. Loop test
3. Calibration
4. D/A trim
HELP | SAVE | HOME

⑭ Press the QUIT (F3) key.

Device Disconnected
RETRY | QUIT

⑮ Press the ⁄ (F3) key to complete the adjustment.

1. Offline
2. Online
3. Frequency Device
4. Utility

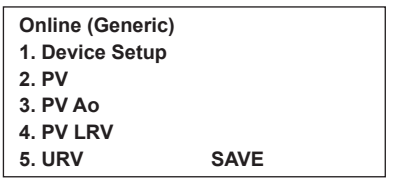
■ Error Display and Troubleshootings

Display	Error	Troubleshooting
Err05	Temperature sensor A, B or all sensors are disconnected.	Check the temperature sensor.
Err06	Temperature sensor B is disconnected.	
Err07	When PV is lower than the low-limit value of set temperature range.	Check low-limit value of the set temperature range.
Err08	When PV is higher than the high-limit value of set temperature range.	Check high-limit value of the set temperature range.

▣ Temperature Range Setting

Connect a HART communicator and set temperature range as below by a HART communicator.

① Press the [1/0] key for 3 sec. Select the **'4. PV LRV'** by [↑], [↓] keys and press the [→] key.

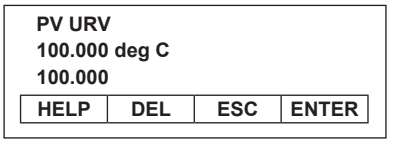


② Select **'1. PV LRV'**(Low temperature range) and press the [→] key.

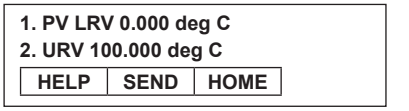
③ Set Low temperature range and press the [ENTER] (F4) key.

④ Select **'2. URV'**(High temperature range) and press the [→] key.

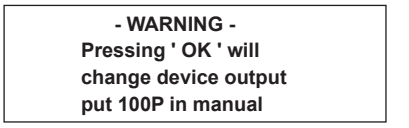
⑤ Set High temperature range and press the [ENTER] (F4) key.



⑥ When the set temperature range is correct, press the [SEND] (F2) key.

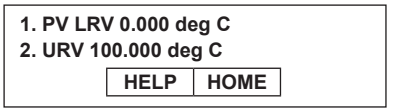


⑦ Press the [O K] (F4) key.



⑧ Press the [O K] (F4) key.

⑨ Check the set temperature range. Press the [HOME] (F3) key. HART communication is OFF.



▣ Proper Usage

◎ Cautions During Use

- Follow instructions in 'Cautions during Use'.
  Otherwise, it may cause unexpected accidents.
- Power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- Keep away from high voltage lines or power lines to prevent inductive noise.
  Do not use near the equipment which generates strong magnetic force or high frequency noise.
- Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.
- The explosion-proof standard of this unit is Ex d IIC T6, protection structure of this unit is IP67 and the range of max. surface temperature is below 85℃.
  Use the verified explosion-proof electric connection (cable gland or sealing fitting)
- This unit may be used in the following environments.
  ①Indoors (in the environment condition rated in 'Specifications')
  ②Altitude max. 2,000m
  ③Pollution degree 2
  ④installation Category II

※ **The explosion-proof unit is certified and the same specifications which is reported to Korea Gas Safety Corporation. (This unit is manufactured following by the announcement 2013-54 of Ministry of Employment and Labor of Korea.)**