

Clamp On Temperature Sensor

Infra Red Thermometer

HCTS Series



General description (HCTS Series)

The TSC is an Infra Red thermometer for non contact temperature measurements.

Both the IR sensitive thermopile detector chip and the signal conditioning ASSP are integrated in the same TO-39 can. Thanks to its low noise amplifier, 17-bit ADC and powerful DSP unit, a high accuracy and resolution of the thermometer is achieved.

The thermometer comes factory calibrated with a digital PWM and SMBus (System Management Bus) output. As a standard, the 10-bit PWM is configured to continuously transmit the measured temperature in range of -20...120°C, with an output resolution of 0.14°C. The factory default POR setting is SMBus.

Field of Applications (HCTS Series)

- 1) In case of semi-conductor machine especially cleaning machine, it is the process that monitors and controls the temperature of fluid in real time such as Ultra-Pure Water (hereafter UPW) that flow in Per-Fluoro-Alkoxy (hereafter PFA) Tube and various chemicals
- 2) All processes that are willing to temperature of the chemicals in other processes.

Features (HCTS Series)

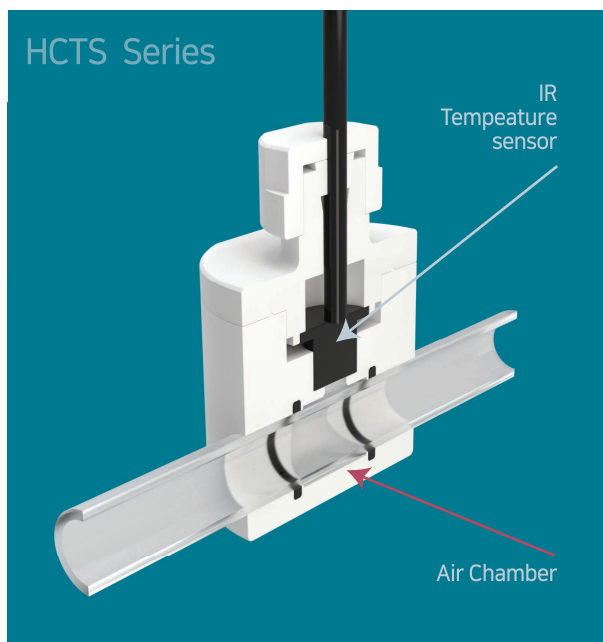
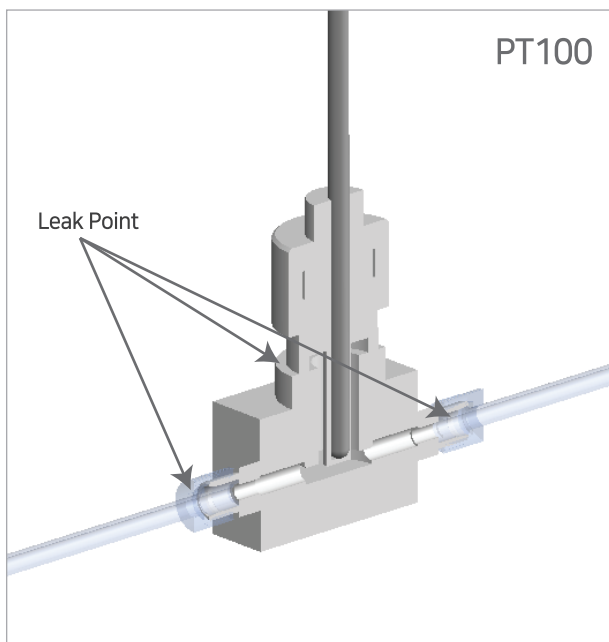
- ▶ Non-contact temperature measurement
- ▶ Emissivity control
- ▶ Short distance temperature measurement
- ▶ Rapid response(0.5Sec)
- ▶ High accuracy with wide temperature range
- ▶ High precision calibration (measuring unit of 0.02 °C)
- ▶ Support power saving mode to reduce power consumption
- ▶ Digital Interface(RS-485 Modbus) - Optional
- ▶ 4-20mA Analog output - Standard
- ▶ Measuring temperature range : -70°C~200°C
- ▶ Environmental temperature range: -20 °C ~125 °C
- ▶ Response time : 95%(10ms)
- ▶ Repeatability : ±0.5 °C
- ▶ Temperature resolving power : < 0.1 °C
- ▶ Measuring precision : ±1% RD
- ▶ Overheat prevention system
- ▶ Supply voltage : DC24V, 100mA

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Disadvantages of PT sensor / Advantages of Clamp-on sensor (HCTS Series)



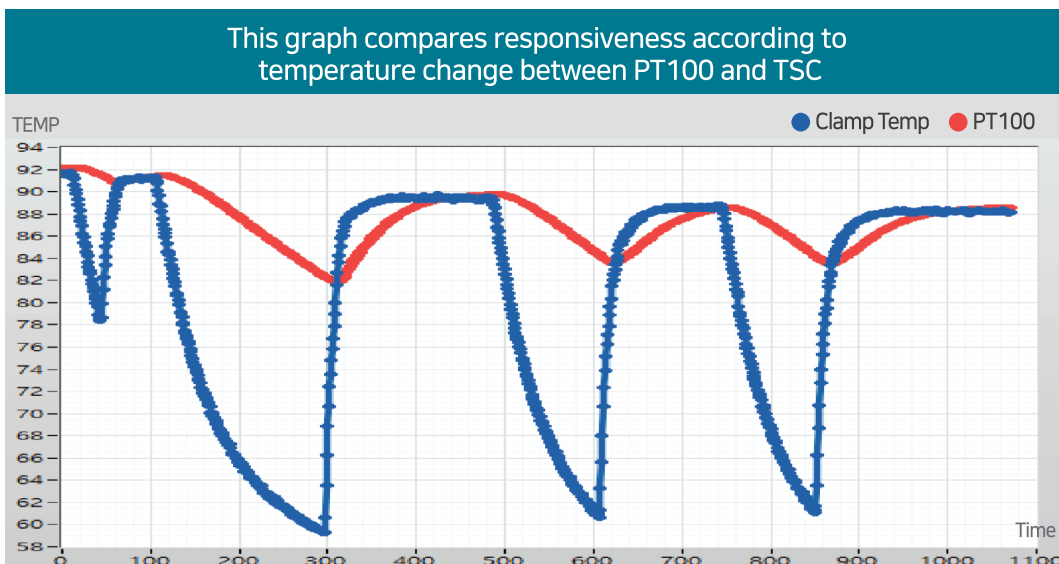
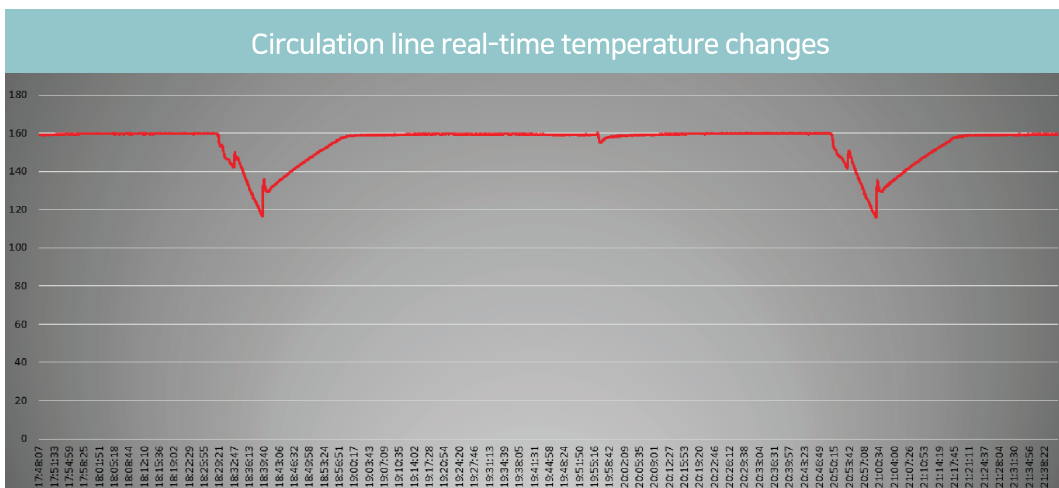
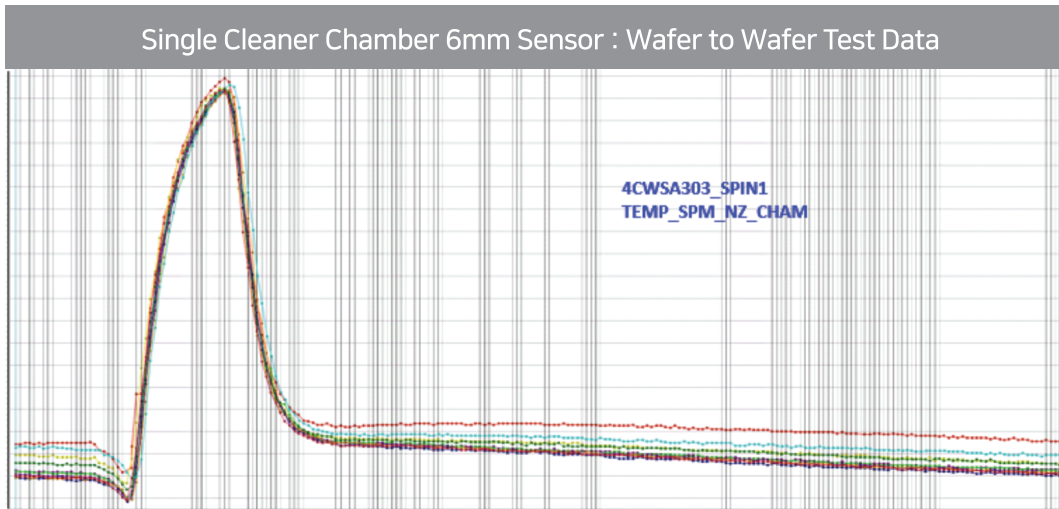
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Item	PT100 temperature sensor	Clamp-on temperature sensor(HCTS)
Chemical resistance	Weak to corrosion	No corrosion
Response (reflection speed)	Slow (10 seconds)	Quick (0.5 second)
Measuring precision	FS of $\pm 3\%$	RD of $\pm 1\%$
Piping work	Required	Not necessary
Waterproof	Not waterproof as sensor is exposed	Waterproof
Installation space /position	Numerous space where installation is not capable	Not influenced by space/position
Replace/repair	Machine down is necessary for replacement/repair	Can replace/repair it without machine down
Leaking point	3 points at least	No leaking point
Lifetime	Less than one year in case of chemicals with strong corrosion	Can use it semi-permanently
Digital communication	None	Support rapid and accurate digital communication

※ As clamp temperature sensor (HCTS) is easy to install and maintain comparing to general PT temperature sensor, construction cost required for piping work can be saved and safety for the worker can be secured in the process of using the chemicals.

Especially, expenditure does not generate from production disruption as machine down from replacement is not required in case of broken temperature sensor in mass production.

SK Hynix mass production line evaluation data (HCTS Series)



Performance graph (HCTS Series)

Temperature accuracy of the HCTS

All accuracy specifications apply under settled isothermal conditions only.
Furthermore, the accuracy is only valid if the object fills the FOV of the sensor completely.

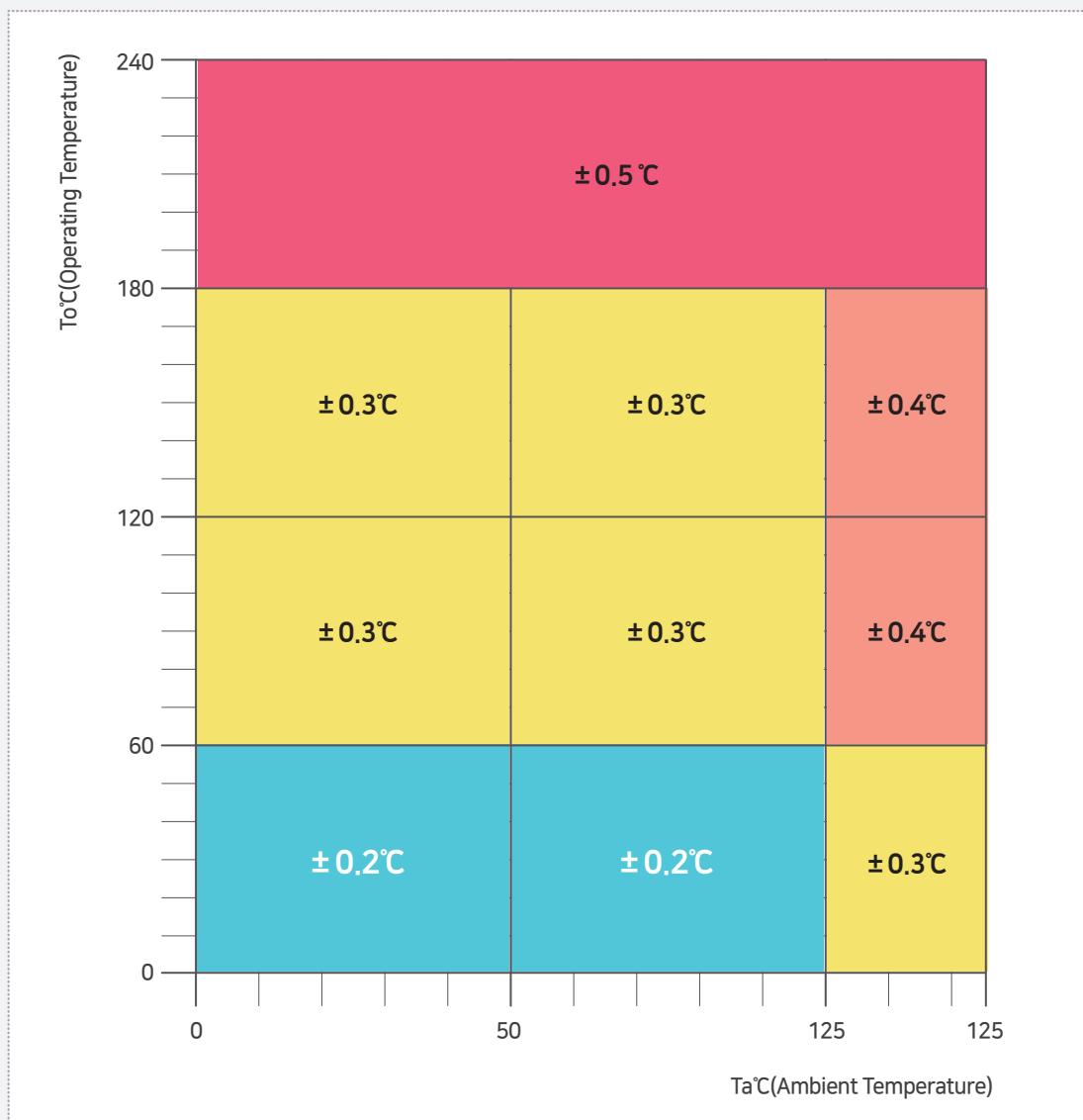


Figure 1: Accuracy of HCTS (Ta, To)


※ All accuracy specifications apply under settled isothermal conditions only.

Calibration RTD : PT 100 Class A Precision rate of RD±0.02%

Temperature sensor specifications (HCTS Series)

Features

- ▶ Overheat prevention system
- ▶ Adjusting emissivity
- ▶ Moving-average control
- ▶ Capable of measuring short distance

 Please refer to "Safety notice" in user manual before using the product.



Specifications

Parameter	TSC
Measuring precision	±0.3°C
Response time	95%(10ms)
Repeatability	±0.2°C
Temperature resolving power	<0.1 °C
Measuring temperature range	0~180°C
Supply Voltage, VDD (over voltage)	7V
Supply Voltage, VDD (operating)	5.5V
Reverse Voltage	0.4 V
Operating Temperature Range, TA	-40...+125°C
Storage Temperature Range, TS	-40...+125°C
Measuring Temperature Range	-70...+380°C
ESD Sensitivity (AEC Q100 002)	2kV
DC current into SCL / Vz (Vz mode)	2 mA
DC sink current, SDA / PWM pin	25 mA
DC source current, SDA / PWM pin	25 mA
DC clamp current, SDA / PWM pin	25 mA
DC clamp current, SCL pin	25 mA

Controller specification (HCTS Series)

DIN W48xH21mm Small Size Digital Panel Meter

Features

- ▶ Max. display: 1234.1
- ▶ Auto Zero function and Hold function
- ▶ 5-segment LED display
- ▶ Power supply : 5VDC, 12~24VDC



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HCTS Controller



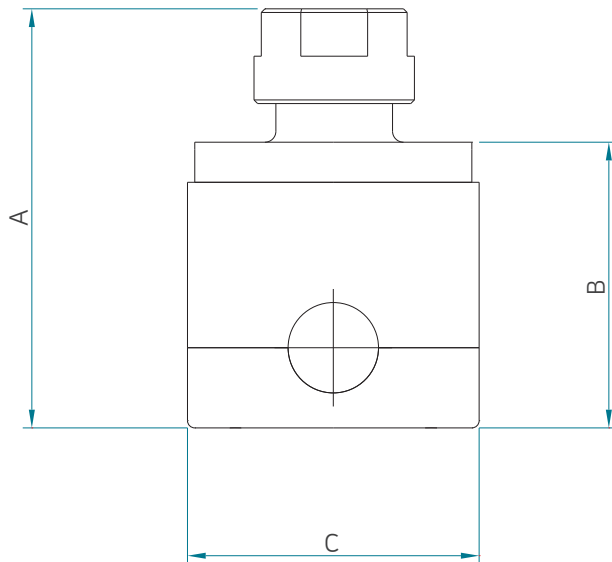
Specifications

Model		HCTS
Measurement input		DC voltage
Power supply		DC 24V ±10% Max 1A
Allowable voltage range		90 to 110% of rated voltage
Power consumption		2W
Display method		5-segment LED display(red) (character height: 10mm)
Max. display range		99999
Display accuracy		FS±0.2% rdg ±1-digit
Sampling period		500ms
Response time		Approx. 1 sec(0 to 1999)
Sampling time		2.5 times/sec
Insulation resistance		Over 100MΩ(at 500VDC megger)
Dielectric strength		2000VAC 50/60Hz for 1 min
Noise immunity		±100V the square wave noise(pulse width; 1μs)by the noise simulator
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz
Shock	Mechanical	300m/s ² (approx. 30G)in each X, Y ,Z direction for 3times
	Malfunction	300m/s ² (approx. 30G)in each X,Y,Z direction for 3times
Environment	Ambient temperature	-10 to 50°C, storage : -20 to 60°C
	Ambient humidity	35 to 85%RH, storage : 35 to 95%RH
Unit weight		Approx. 50g

※ Environment resistance is rated at no freezing or condensation.

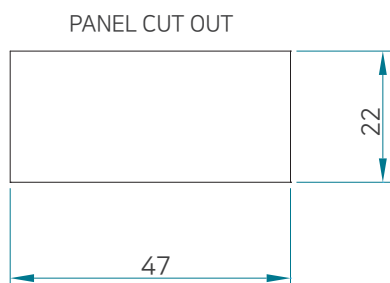
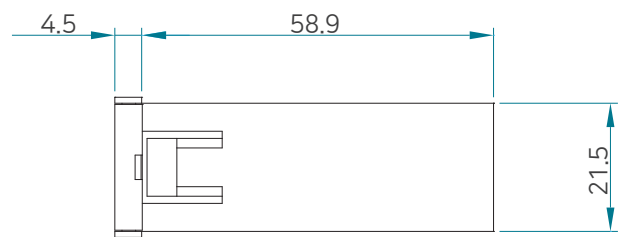
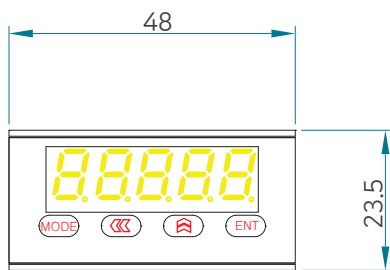
Dimension (HCTS Series)

Figure 2: Temperature Sensor Body Dimension



	A	B	C
1/8inch	35		□22
1/4inch	53	34	Ø34
3/8inch	54	36	Ø36
1/2inch	58	40	Ø40
3/4inch	65	47	Ø48
1/1inch	71	53	Ø55

Figure 3: Temperature Sensor Controller Dimension



HCTS Series

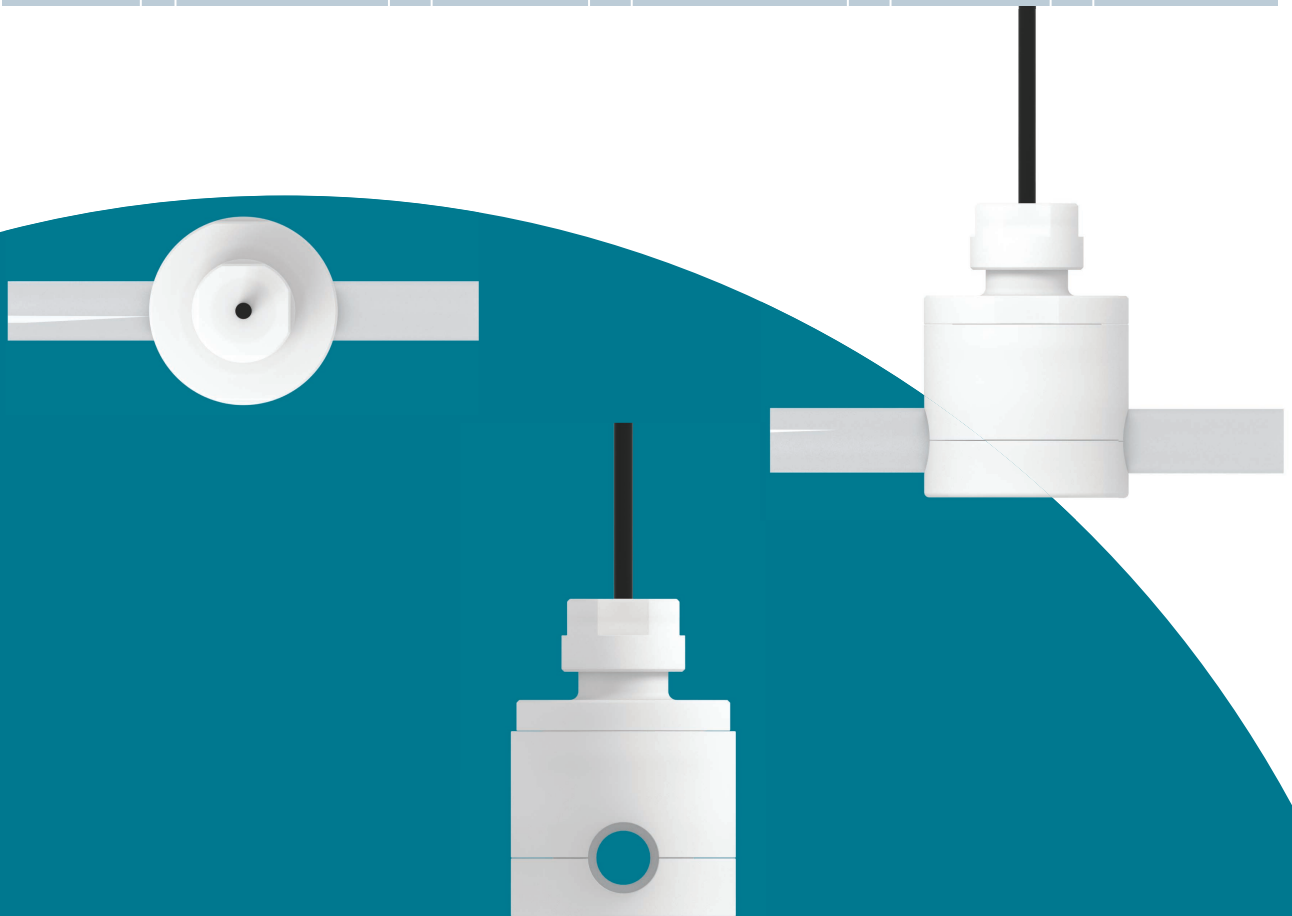
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Temperature sensor model code (HCTS Series)

Ex : HCTS-H-A06-1.0-A-DI

Model No	Temperature Code	Tube size Code	Tube thickness Code(mm)	Output	Chemicals Code
HCTS	R(0~100°C)	06(mm)	0.5(0.5t)	A(4~20mA)	DI(DI)
	H(0~200°C)	10(mm)	1.0(1t)	D(RS-485)	H2(H2SO4)
		12(mm)	1.2(1.19t)		H3(H3PO4)
		20(mm)	1.5(1.57t)		IP(IPA)
		25(mm)	For other specs, please inquire.		TR(The rest)
		A03(1/8")			
		A06(1/4")			
		A10(3/8")			
		A12(1/2")			
		A20(3/4")			
		A25(1/1")			

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HJS

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