



# SMART TEMPERATURE TRANSMITTER

## Model 21 & 22

### Introduction

The Smart Temperature Transmitter is a microprocessor-based high performance transmitter, which has flexible sensor input and output, automatic compensation of ambient temperature and process parameters, configuration of various parameters, communication with HART protocol. All Data of Sensor (Tag No., type, range etc.) is to be input, modified and stored in EEPROM.



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### Feature

- Stability
- Repeatability
- Update time and turn on time
- Failure model
- Power supply effect

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### Function

- Flexible Sensor Input : RTD, T/C, mV, Ohm
  - Various Output : 4 ~20mA(Analog) , 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 : KOSHA, KTL, ATEX FM GOST etc.
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Specification

1 Temperature Sensor Range & Accuracy

Sensor Type	Sensor Reference	Input Range	Minimum Span	Digital Accuracy	D/A Accuracy Of Span
<b>RTD</b>					
Pt-100	KSC 1603-1991 (a=0.00385) DIN	-200 ~ 650°C	15°C	±0.17°C	±0.03%
Pt-100	JISC 1604-1981 (a=0.00391)	-200 ~ 650°C		±0.16°C	
<b>Thermocouple</b>					
NIST Type B	KSC1602-1982	100 ~ 1,820°C	25°C	±0.77°C	±0.03%
NIST Type E		200 ~ 1,000°C		±0.20°C	
NIST Type J		200 ~ 1,200°C		±0.25°C	
NIST Type K		200 ~ 1,350°C		±0.35°C	
NIST Type N		200 ~ 1,300°C		±0.40°C	
NIST Type R		0 ~ 1,760°C		±0.60°C	
NIST Type S		0 ~ 1,740°C		±0.50°C	
NIST Type T		-200 ~ 400°C		±0.25°C	
mV Input				-10 ~ 75 mV	
Ohm Input		0 ~ 340 Ω	20 Ω	± 0.35 Ω	

- < Note > 1) RTD input: a= 0.00385: KS, JIS, DIN, IEC, a= 0.00391: US.  
 2) Thermocouple input: KSC 1602-1982, JISC 1602-1981, ANSI MC96.1-1982  
 3) Digital accuracy for Type B is ± 3.0°C from 100 to 300°C  
 4) Digital accuracy for Type K is ± 0.50°C from -180 to -90°C

Ambient Temperature Effects ( per 1°C change in Ambient temperature)			
	Sensor Type	Digital Accuracy	D/A effect per
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 Specification

Power Supply	Voltage Range : 12 to 45 Vdc Voltage Rating : 24 Vdc ±30%	Output Signal	4 ~ 20 mA dc / HART
HART Loop Resistance	250 ~ 550 ohm(24 Vdc)	Isolation	500 Vrms (707 Vdc)

3 Performance Specification

Accuracy	Refer to item No.1	Operating Temp	-40 ~ +85°C
Stability for 2 year	±0.1% of Reading or 0.1°C whichever is greater	LCD Meter Operating Tem	-30 ~ +80°C
Ambient Temp. Effect	±0.05% of Span/10°C	Humidity Limits	5% ~ 100% RH(21)
Repeatability	±0.05% of Span	Power Supply Effect	±0.005% of Span/V

4 Physical Specification

Electrical Connections	1/2-14NPT(w/M3.5)	Weight (excluding Option Items)	1.2Kg below (standard) 2.6Kg (SST Housing)
Electronics Housing	Aluminum	2" Pipe Stanchion Type bracket	Angle or Flat Type
O-ring	Buna-N	Housing Class	Waterproof (IP67)

## Ordering Code

MODEL NO.	Code	Description
21	-S	Single Element
	-D*	Dual Elements
Housing Materials and Electrical Connection	1	1/2 - 14 NPT Epoxy Coated-Aluminium
	2	G1/2 (Adapter) Epoxy Coated-Aluminium
	X	Special
Process Connection	1	1/2 - 14 NPT Epoxy Coated-Aluminium
	2	G1/2 (Adapter) Epoxy Coated-Aluminium
	X	Special
Sensor Position	H	Horizontal Type
	V	Vertical Type
Sensor Type	A <input type="checkbox"/>	RTD (PT100[Ω]) / <input type="checkbox"/> (with Wires)
	T <input type="checkbox"/>	Thermocouple / <input type="checkbox"/> (with Type)
	R	Resistor
	M	Mili-volt
Hazardous Locations Certifications	K0	Maker Standard (Waterproof : IP67)
	K1	KOSHA Flameproof Approval: Ex d IIC T6.
	K2	KTL Intrinsic Safety Approval : Ex ia IIC T5
	E1	ATEX Flameproof
	F1	FM & FM Canada Explosion proof
	*F2	FM & FM Canada Intrinsic safety
Option	M1	LCD Indicator
	BA	Stainless Steel Bracket (Angle type) with SST Bolts
	BF	Stainless Steel Bracket (Flat type) with SST Bolts
	ST	Stainless Steel Housing
	X1	Assembly Option (Element/Well)

Example: 21-S-K1-1-1-H-A3-M1-BA

Note 1: "\*" before order.

MODEL NO.	Code	Description
22	-S	Single Element
	-D*	Dual Element (Special Order, Request to manufacturer if necessary)
Housing Materials	1	Plastic
	X	Special
Hazardous Locations Certifications	KO	Maker Standard
Sensor Type	A <input type="checkbox"/>	RTD (PT100[Ω]) / <input type="checkbox"/> (with Wires)
	T <input type="checkbox"/>	Thermocouple / <input type="checkbox"/> (with Type)
	R	Resistor
	M	Mili-volt
Sensor Fail Mode	D	Downscale
	U	Upscale

Ex): 22-S-1-K0-A3-D

Note: "\*" before order.

### Distributor:

LKS West Instruments Sdn Bhd<sup>(834286-T)</sup>  
 No. 50-2, Jalan Sunga Rasau D32/D,  
 Berjaya Park, Seksyen 32, Shah Alam  
 40460, Selangor, Malaysia  
 Tel: +603-5525 5038  
 Fax: +603-5525 5037  
 Email: [info.west@lkssb.com.my](mailto:info.west@lkssb.com.my)