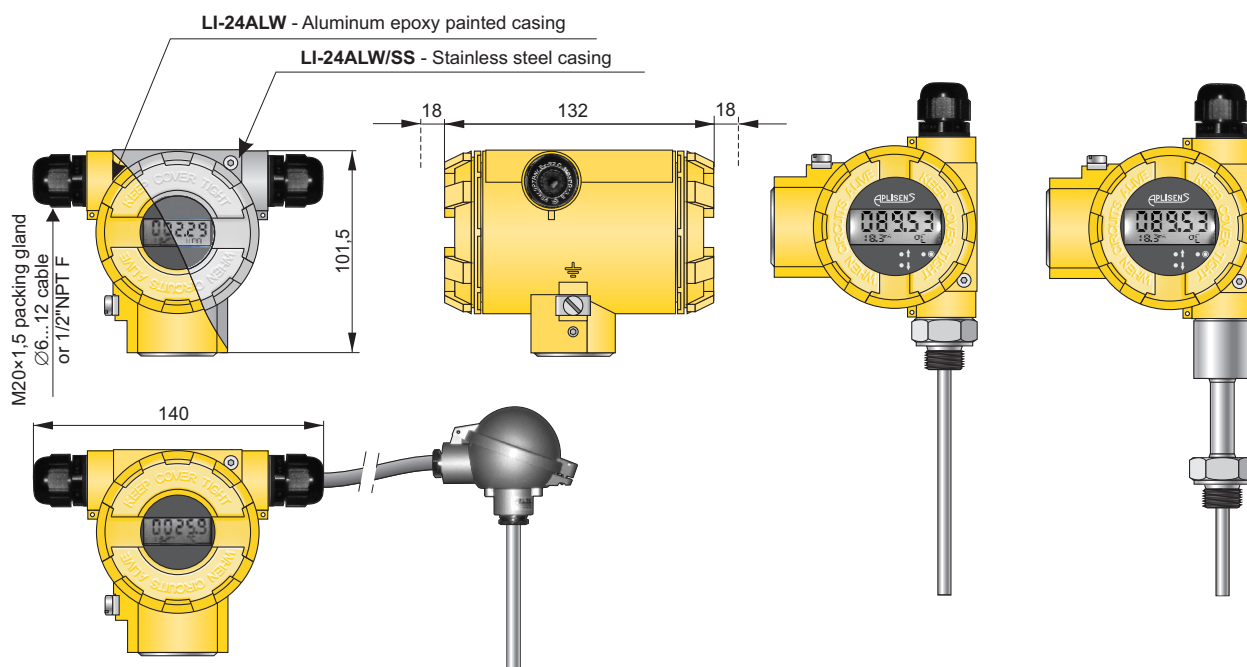


Smart temperature transmitter LI-24ALW



- ✓ Output signal 4...20mA with Hart protocol
- ✓ Galvanic insulation (In, Out)
- ✓ Programmable sensor type
- ✓ Programmable measuring range
- ✓ Thermoresistance line compensation
- ✓ Compensation of thermocouple cold junction
- ✓ Autodiagnostic system
- ✓ Intrinsic safety certificate (ATEX, IECEx)
- ✓ Explosion proof certificate (ATEX, IECEx)



LI-24ALW with remote mounted temperature sensor

LI-24ALW with direct mounted temperature sensor

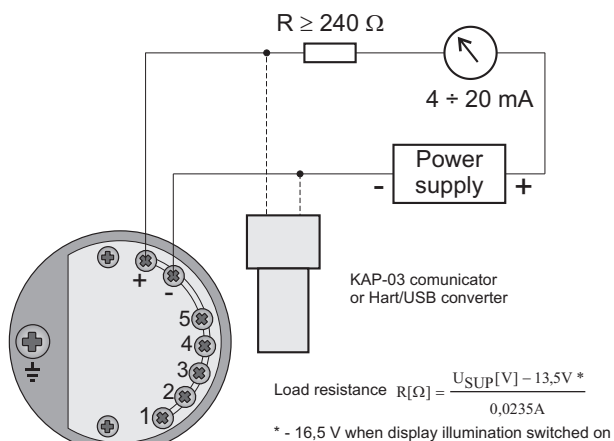
Application and function

The temperature transmitter LI-24ALW is applicable to converting resistance of temperature or voltage of thermocouple sensor to standard current signal 4-20mA. The transmitter has two separate channels enabling measurement of temperature difference, average, average with redundancy, max. or min. temperature. Transmitter has compensation of ambient temperature influence and compensation of thermocouple cold junction using internal/external (Pt100) sensor or constant temperature. Most of parameters such as: sensor type, measuring range, current alarm signal when electric circuit is broken, output characteristic correction, user characteristic (60 points) are programmed using PC with HART/USB converter and Aplisens RAPORT 2 configuration software. For request Aplisens can set temperature transmitter parameters like measuring range, type of sensor. Their values are printed on label. Transmitter LI-24/ALW is designed for field use. LI-24ALW can be used with temperature sensors mounted directly in transmitter's casing or with external sensors connected with cable.

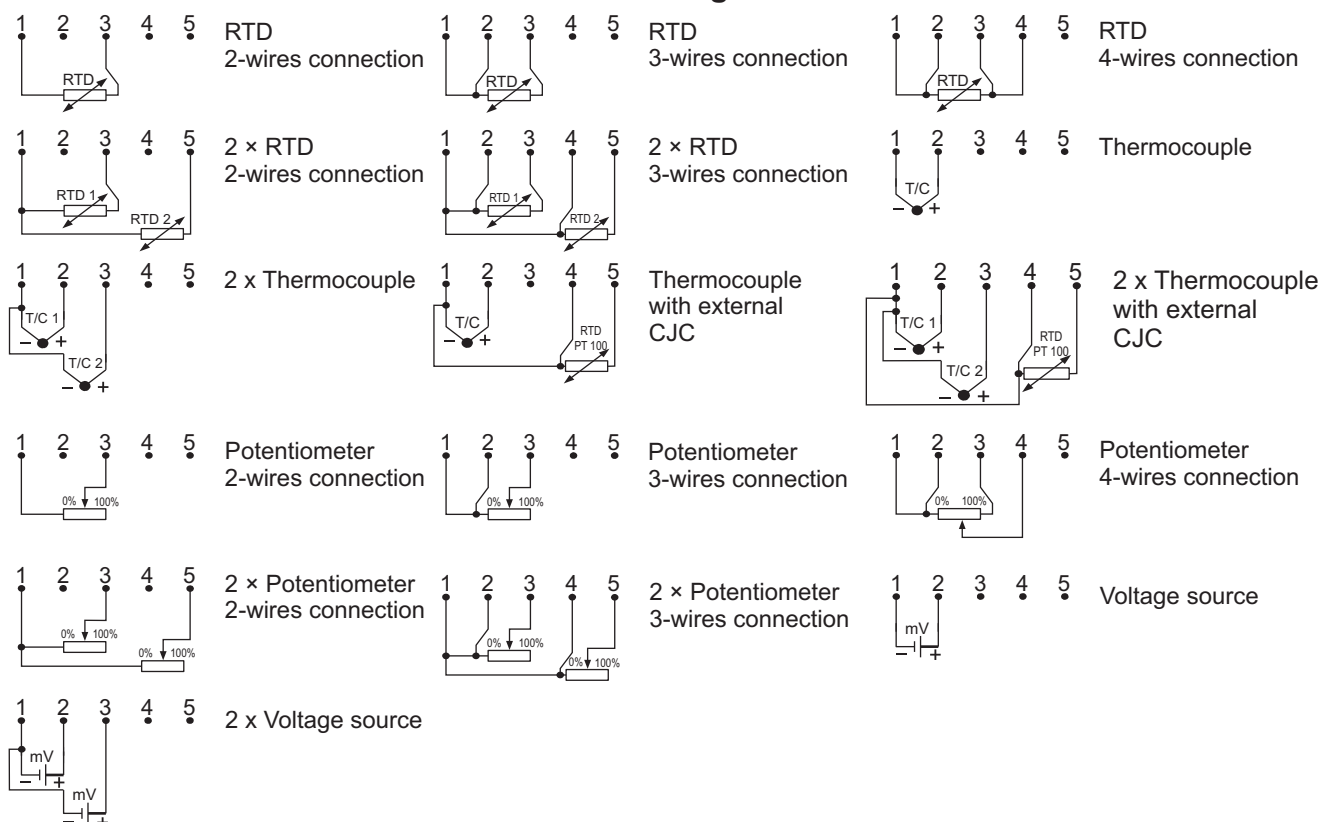
Technical data

Input signal	K, J, S, B, N, T, R, E, voltage Pt100, Ni100 resistance
Limit process	-10mV < E < 100mV or -100mV < E < 1000mV 0Ω < R < 400Ω or 0Ω < R < 2000Ω
Min. measuring range	10mV or 10Ω or 10K
Output signal	4 - 20 mA + Hart
Power supply	13,5...55 VDC (Ex 13,5..30 VDC) when display illumination switched on 16,5...55 VDC (Ex 16,5..30 VDC)
Max. wires resistance	500Ω
Alarm signal	3,75mA / 21,5mA (NORMAL) or 3,6 mA / 21 mA (NAMUR NE89) or setting by user
Sensor current	0,42mA
Galvanic insulation	Optoelectrical
Accuracy	acc. to below table
Time constant	0,3s
Additional electronic damping	0..30s
Ambient temperature	-40...+80°C (Ex -40...+75°C)

Electrical diagrams



Electrical diagrams



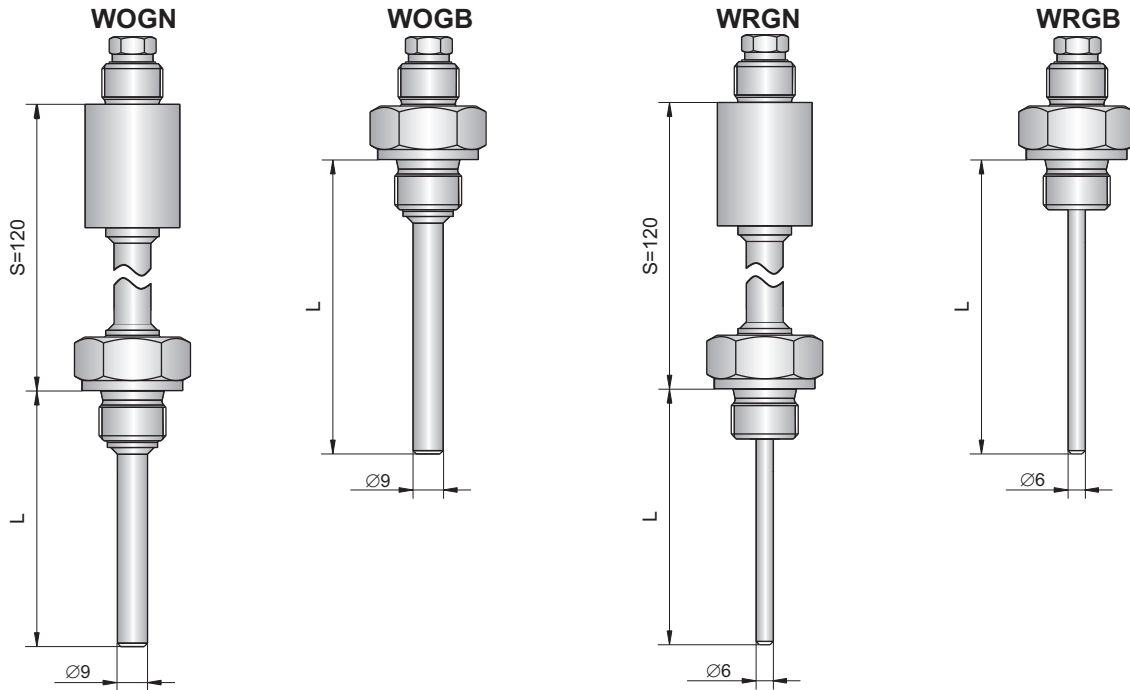
Type of input signals and metrological parameters

RTD sensor connected with 2, 3 or 4 wires							
Input – RTD			2, 3 or 4 wires connection				
Thermal resistance sensors			~420uA				
Sensor current			25Ω				
Maximum wires resistance			10 °C				
Minimum range							
Sensor type	Standard	Basic range	Min. range span	Processing error Δp	Temperature processing error Δtp	Analogue output error	
		°C	°C	K	K/K	%	
1	2	3	4	5	6	7	
Pt10 (α=0.003850)	EN 60751+A2, IEC751, DIN43760, JISC 1604-97, BS 1904	-200÷850	10	±0.8	±0.035	Analogue output error is 0.05% FSO (Full Scale Output) over the operating temperature range.	
Pt50 (α=0.003850)		-200÷850	10	±0.2	±0.0070		
Pt100 (α=0.003850)		-200÷850	10	±0.07	±0.0035		
Pt200 (α=0.003850)		-200÷850	10	±0.2	±0.0020		
Pt500 (α=0.003850)		-200÷850	10	±0.05	±0.0007		
Pt1000 (α=0.003850)		-200÷266	10	±0.03	±0.0003		
Pt 98 (α=0.003923)	SAMA RC-4-1966	-200÷650	10	±0.07	±0.0035		
Ni100 (W100=1.617)	PN-83/M-53952	-60 ÷ 180	10	±0.07	±0.0030		
Cu100 (W100=1.426)		-50 ÷ 180	10	±0.07	±0.0030		
Pt10 (α=0.003916)	JIS C1604-81	-200÷630	10	±0.8	±0.035		
Pt50 (α=0.003916)		-200÷630	10	±0.2	±0.0070		
Pt100 (α=0.003916)		-200÷630	10	±0.07	±0.0035		
Pt10 (W100=1.3910)	GOST 6651-94	-200÷1100	10	±0.8	±0.035		
Pt50 (W100=1.3910)		-200÷1100	10	±0.2	±0.0070		
Pt100 (W100=1.3910)		-200÷1100	10	±0.07	±0.0035		
Pt500 (W100=1.3910)		-200÷1100	10	±0.05	±0.00070		
Cu50 (W100=1.426)		-50 ÷ 200	10	±0.2	±0.0070		
Cu100 (W100=1.426)		-50 ÷ 200	10	±0.07	±0.0030		
Cu50 (W100=1.428)		-185 ÷ 200	10	±0.2	±0.0070		
Cu100 (W100=1.428)		-185 ÷ 200	10	±0.07	±0.0030		
Ni100 (W100=1.617)		-60 ÷ 180	10	±0.07	±0.0030		
Resistance (resistor, potentiometer)							
		Ω	Ω	mΩ	mΩ/K	As above	
Measuring range No.1		0...400	10	±30	±2		
Measuring range No.2		0...2000	10	±120	±2		
1	2	3	4	5	6	7	

Thermocouples						
Input – Thermocouples						
Input impedance			>10MΩ			
Maximum wires resistance			500Ω (wires + thermocouple)			
Cold junctions compensation			internal sensor, external sensor Pt100			
Minimum range			temperature constant of the cold junctions 50 °C			
Sensor type	Standard	Basic range	Min. range span	Processing error Δp	Temperature processing error Δtp	Analogue output error
		°C	°C	K	K/K	%
1	2	3	4	5	6	7
B (Pt30Rh-Pt6Rh)	EN 60751+A2, IEC584, NIST MN175, DIN43710, BS4937, ANSI MC96.1, JIS C1602, NF C42-321	250 ÷ 1820	10	±0.55	<±0.001	Analogue output error is 0.05% FSO (Full Scale Output) over the operating temperature range.
E (Ni10Cr-Cu45Ni)		-200 ÷ 1000	10	±0.15	<±0.001	
J (Fe-Cu45Ni)		-210 ÷ 1200	10	±0.20	<±0.001	
K (Ni10Cr-Ni5)		-200 ÷ 1372	10	±0.30	<±0.001	
N(Ni14CrSi-NiSi)		-200 ÷ 1300	10	±0.25	<±0.001	
R(Pt13Rh-Pt)		-20 ÷ 1768.1	10	±0.35	<±0.001	
S(Pt10Rh-Pt)		-30 ÷ 1768.1	10	±0.40	<±0.001	
T(Cu-Cu45Ni)		-200 ÷ 400	10	±0.15	<±0.001	
TC Type L	EN 60751+A2, GOST P 8.585-2001	-200 ÷ 800	10	±0.20	<±0.001	

Voltage						
		mV	mV	μV	μV/K	As above
Measuring range No.1		-10...100	10	±6	<±0.06	
Measuring range No.2		-100...1000	10	±50	<±0.5	
1	2	3	4	5	6	7

Direct mounted sensors



Sensor type	Standard dimensions of sensor			Sensor material	Available process connection
	Ø[mm]	L[mm]	S[mm]		
WOGN	9	100, 160, 250, 400	120	304ss, 316Lss	M20x1,5; G1/2"; 1/2"NPT
WOGB	9	100, 160, 250, 400	-	304ss, 316Lss	M20x1,5; G1/2"; 1/2"NPT
WRGN	6	100, 160, 250, 400	120	304ss, 316Lss	M20x1,5; G1/2"; 1/2"NPT
WRGB	6	100, 160, 250, 400	-	304ss, 316Lss	M20x1,5; G1/2"; 1/2"NPT

WOGN, WOGB - welded sensors; WRGN, WRGB - spring-loaded sensors (to use with additional thermowell)

Ordering code

LI-24ALW / / / ÷ °C / /

Version:

Exia – Intrinsic safety certificate (ATEX, IECEx)

II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb
IECEx Ex ia IIC T4/T5/T6 Ga/Gb 1) II 2(1)G Ex ia [ia Ga] IIC T4/T5/T6 Ga/Gb
IECEx Ex ia [ia Ga] IIC T4/T5/T6 Ga/Gb 2)

Exia(Da) – Intrinsic safety certificate (ATEX, IECEx)

II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb
 II 1D Ex ia IIIC T105°C Da
 I M1 Ex ia I Ma (with SS enclosure)
IECEx Ex ia IIC T4/T5/T6 Ga/Gb
IECEx Ex ia IIIC T105°C Da
 Ex ia I Ma (with SS enclosure) 1) II 2(1)G Ex ia [ia Ga] IIC T4/T5/T6 Ga/Gb
 II 1D Ex ia IIIC T105°C Da
 I M1 Ex ia I Ma (with SS enclosure) 2)
IECEx Ex ia [ia Ga] IIC T4/T5/T6 Gb
IECEx Ex ia IIIC T105°C Da
 Ex ia I Ma (with SS enclosure)

Exd – Explosion proof certificate (ATEX, IECEx)

II 2G Ex d IIC T* Gb
 II 2D Ex t IIIC T* Db
 I M2 Ex d I Mb (with SS enclosure)
IECEx Ex d IIC T* Gb
IECEx Ex t IIIC T* Db
 Ex d I Mb (with SS enclosure) 1) II 2(1)G Ex d [ia Ga] IIC T4/T5/T6 Gb
 II 2(1)D Ex t [ia Da] IIIC T105°C Db
 I M2 Ex d [ia Ma] I Mb (with SS enclosure) 2)
IECEx Ex d[ia Ga] IIC T4/T5/T6 Gb
IECEx Ex d[ia Da] IIIC T105°C Db
 Ex t[ia Ma] I Mb (with SS enclosure)

1) transmitter with sensor mounted in casing 2) transmitter without sensor or with cable sensor

IP67 – protection class IP67

SS – housing material SS316

US – electrical and sensor connection 1/2"NPT F

Sensor type (optionally):
 Direct: **WOGN, WOGB, WRGN, WRGB**
 (According to below ordering code)
 Remote: According to **Chapter X**

Settings (optionally):
 Type of measuring element,
 measuring range, alarm signal

WOGN/Exia/L=400mm/S=120mm/G1/2"/Pt100-A-2/316Lss/1/2"NPT

Type of sensor

Version: Standard, Exia, Exd

Dimensions L and S [mm]

Process connection

Connection thread
 between sensor
 and transmitter

Sensor material

Type of measuring element