

JMS-SE 8R / 8RX Programmable Universal Intelligent 2-wire DIN Rail Transmitters

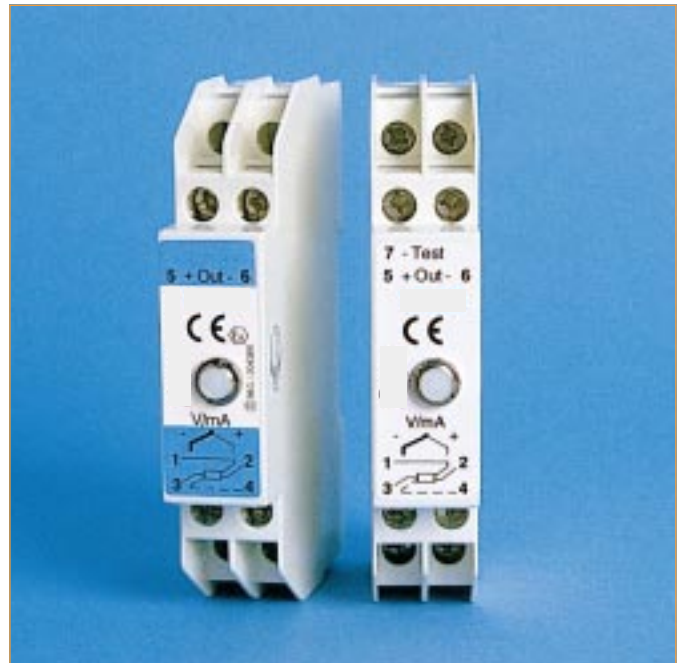


8R is a universal and intelligent 2-wire DIN rail transmitter for temperature and other measurement applications.

8RX is the Intrinsic Safe version for use in Ex-applications.

The combination of *competitive pricing, functionality and simple configuration* has made 8R and 8RX leading DIN rail transmitters for industrial temperature measurements.

The Windows based and user friendly software is used for transmitter configuration, documentation, monitoring and calibration purposes.



Performance and design:

Excellent stability

- Long-term stability 0.1 %/year.

Enhanced total system accuracy

- Sensor error correction (for known sensor errors).
- System error correction (against known temperatures).

NAMUR-compliant

- Output limitations and fail currents according to NAMUR recommendations

Input-Output isolation 1500 VAC

- Eliminates measuring errors due to ground loops.

High load capacity

- Only 7.5 V voltage drop over the transmitter (8R) allows for high loads.

Designed for harsh conditions

- Excellent EMC performance.
- Durable due to protected PCBs.

Space saving and simple mounting

- Only 17.5 mm / 0.7 inch wide.
- Quick mounting on DIN rail.

Functions:

Input for RTDs, T/Cs, mV and resistance

- Reduced inventory costs.
- Simplified plant engineering.

Input for mA (separate version of 8R)

- Active 2-wire isolator / load amplifier.
- Only 10 W input impedance.

True on-line communication

- Full access to all features while in operation.

Sensor diagnostics

- Selectable sensor break action.

Simplified loop check-up

- The transmitter works as an accurate current generator.

On-screen indications and line recording

- Valuable tools for temporary measurements.

5 year limited warranty.

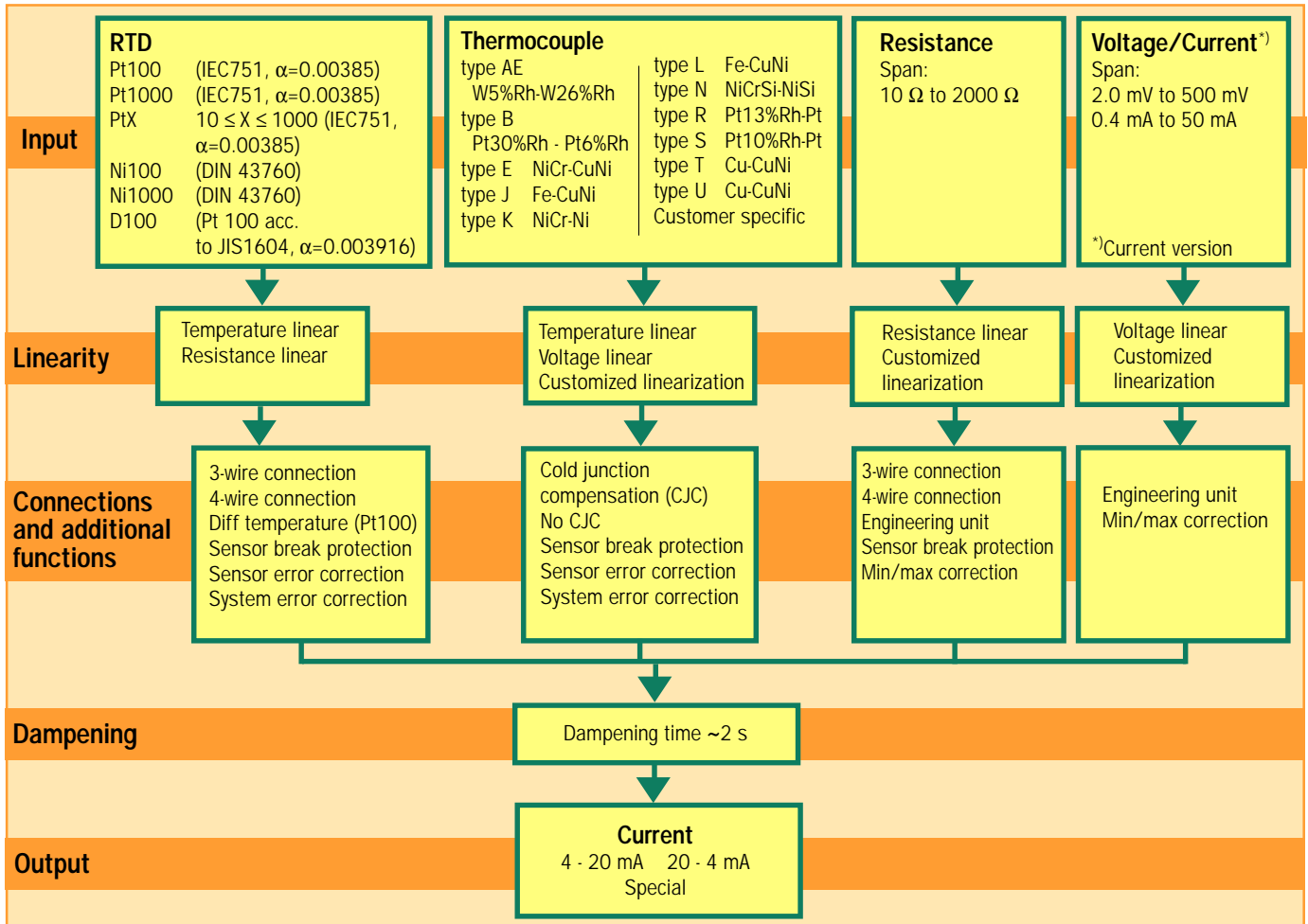


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Configuration Scheme



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Specifications

Input		
RTD's and Resistance		
Pt100 (IEC751, $\alpha = 0.00385$)	3-, 4-wire connection	-200 to +1000 °C / -328 to +1832 °F
Pt1000 (IEC751, $\alpha = 0.00385$)	3-, 4-wire connection	-200 to +200 °C / -328 to +392 °F
PtX $10 \leq X \leq 1000$ (IEC751, $\alpha = 0.00385$)	3-, 4-wire connection	Upper range depending on X-value
Ni100 (DIN 43760)	3-, 4-wire connection	-60 to +250 °C / -76 to +482 °F
Ni1000 (DIN 43760)	3-, 4-wire connection	-60 to +150 °C / -76 to +302 °F
D100 (Pt 100 acc.to JIS1604, $\alpha = 0.003916$)	3-, 4-wire connection	-200 to +1000 °C / -328 to +1832 °F
Potentiometer/resistance	3-, 4-wire connection	0 to 2000 Ω
Sensor current		~ 0.4 mA
Maximum sensor wire resistance		25 Ω /wire
Thermocouples, Voltage and Current		
T/C	Type: AE, B, E, J, K, L, N, R, S, T, U	Ranges according to users manual
Voltage		-10 to +500 mV
Current	8R ¹⁾	-1 to +50 mA
Input impedance	T/C, Voltage	>10 M Ω
	Current	10 Ω
Maximum sensor wire resistance	T/C, Voltage	500 Ω (total loop)
Monitoring		
Sensor break monitoring	User definable output	3.5 to 21.6 mA
Adjustments		
Zero adjustment	All inputs	Any value within range limits
Minimum spans	Pt100, Pt1000, Ni100, Ni1000	10 °C / 18 °F
	Potentiometer	10 Ω
	T/C, Voltage	2 mV
	Current	0.4 mA
Output		
Straight, reversed or any intermediate value		4-20/20-4 mA
Resolution		5 μ A
Minimum output signal	Measurement/Failure	3.8 mA / 3.5 mA
Maximum output signal	Measurement/Failure	20.5 mA / 21.6 mA
Permissible load, see fig.4	8R	750 Ω @ 24 VDC, 22 mA
	8RX	725 Ω @ 24 VDC, 22 mA
Temperature		
Ambient, storage		-20 to +70 °C / -4 to +158 °F
Ambient, operation		-20 to +70 °C / -4 to +158 °F
General data		
Selectable dampening time		~ 2 s
Update time		~ 1.5 s
Isolation In - Out	Isolated versions	1500 VAC, 1 min
Humidity (non-condensing)		0 to 95 % RH
Intrinsic safety	8RX , ATEX	II (1) G [EEx ia] IIC
	FM	I.S.Connections to Class I-III, Div. 1, Group A-G
Power supply, polarity protected		
Supply voltage	8R	7.5 to 36 VDC 2-wire
	8RX	8.0 to 30 VDC 2-wire
Permissible ripple		4 V p-p @ 50/60 Hz

¹⁾ Separate version of 8R only for current input.



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Accuracy		
Linearity	RTD Potentiometer, mV, mA	$\pm 0.1\%$ ¹⁾
	T/C	$\pm 0.2\%$ ¹⁾
Calibration	RTD	Max. of $\pm 0.2\text{ }^{\circ}\text{C}$ / $\pm 0.4\text{ }^{\circ}\text{F}$ or $\pm 0.1\%$ ¹⁾
	Potentiometer	Max. of $\pm 0.1\ \Omega$ or $\pm 0.1\%$ ¹⁾
	mV, T/C	Max. of $\pm 20\ \mu\text{V}$ or $\pm 0.1\%$ ¹⁾
	mA 8R ⁴⁾	Max. of $\pm 4\ \mu\text{A}$ or $\pm 0.1\%$ ¹⁾
Cold Junction Compensation (CJC)	T/C	$\pm 0.5\text{ }^{\circ}\text{C}/\pm 0.9\text{ }^{\circ}\text{F}$
Temperature influence ⁵⁾	All inputs	Max. of $\pm 0.25\text{ }^{\circ}\text{C}/25\text{ }^{\circ}\text{C}$ or $\pm 0.25\%/25\text{ }^{\circ}\text{C}$ ^{1) 3)}
		Max. of $\pm 0.5\text{ }^{\circ}\text{F}/50\text{ }^{\circ}\text{F}$ or $\pm 0.28\%/50\text{ }^{\circ}\text{F}$ ^{1) 3)}
Temperature influence CJC ⁵⁾	T/C	$\pm 0.5\text{ }^{\circ}\text{C}/25\text{ }^{\circ}\text{C}$ / $\pm 1.0\text{ }^{\circ}\text{F}/50\text{ }^{\circ}\text{F}$
Instrument calibration output	4-20 mA	$\pm 8\ \mu\text{A}$
Sensor wire resistance influence	RTD, Potentiometer, 3-wire	Negligible ²⁾
	RTD, Potentiometer, 4-wire	Negligible
	mV, T/C, mA	Negligible
Load influence		Negligible
Power supply influence		Negligible
RFI influence, 0.15-1000 MHz, 10 V or V/m		$\pm 0.2\%$ ¹⁾ (typical)
Long-term stability		$\pm 0.1\%$ ¹⁾ /year
Housing		
Material / Flammability (UL)		PC + Glass fibre/VO
Mounting		Rail acc. to DIN EN 50022, 35 mm
Connection	Single/stranded wires	$\leq 1.5\text{ mm}^2$, AWG 16
Weight		70 g
Protection, housing / terminals		IP 20 / IP20

¹⁾ Of input span

²⁾ With equal wire resistance

³⁾ If zero-deflection > 100% of input span:
add 0.125% of input span/ $25\text{ }^{\circ}\text{C}$ or 0.14%
of input span/ $50\text{ }^{\circ}\text{F}$ per 100% zero-deflection

⁴⁾ Separate version of "8R", only for current input

⁵⁾ Reference temperature $23\text{ }^{\circ}\text{C}/73\text{ }^{\circ}\text{F}$

The User Instructions must be read prior to adjustment and/or installation.

Intrinsic Safety specifications

Specifications	8RX isolated	8RX isolated
Approval	Demko / ATEX	Factory Mutual (FM)
Classification	II (1) G [Ex ia] IIC	IS connections to Class I-III, Div. 1, Group A-G
Certificate No.	DEMKO 03 ATEX 134461X	J.I. 0D6A8.AX, Drw. 3-7852
Output/Supply		
Max voltage to transmitter	$U_i = 30\text{ Vdc}$	$V_{max} = 30\text{ Vdc}$
Max current to transmitter	$I_i = 100\text{ mA}$	$I_{max} = 100\text{ mA}$
Max power to transmitter	$P_i = 0.9\text{ W}$	$P_{max} = 900\text{ mW}$
Internal inductance	$L_i = 0\text{ mH}$	Not applicable
Internal capacitance	$C_i = 1\text{ nF}$	Not applicable
Input (Sensor)		
Max voltage from transmitter	$U_o = 30\text{ Vdc}$	$V_{oc} = 30\text{ Vdc}$
Max current from transmitter	$I_o = 27\text{ mA}$	$I_{sc} = 25\text{ mA}$
Max power from transmitter	Not specified	Not specified
Max inductance (input loop)	$L_o = 50\text{ mH}$	$L_a = 56.8\text{ mH}$
Max capacitance (input loop)	$C_o = 52\text{ nF}$	$C_a = 0.12\ \mu\text{F}$



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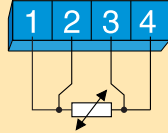
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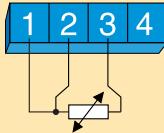
INPUTS

RTD

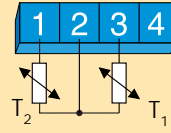
Pt100, Pt1000, Ni100, Ni1000, PtX, D100
4-wire connection



3-wire connection

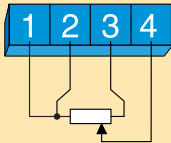


Pt100
Diff temperature $T_1 > T_2$

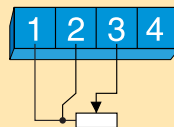


Potentiometer

4-wire connection

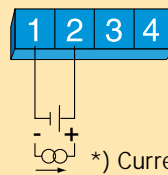


3-wire connection



Voltage/Current *)

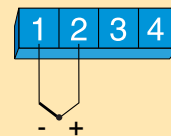
mV/mA *)



*) Current version

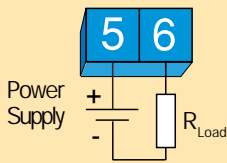
Thermocouple

AE, B, E, J, K, L, N, R, S, T, U
or customer specific

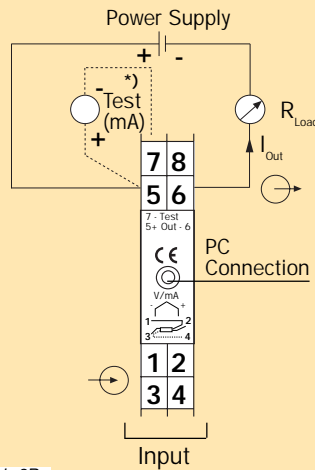


OUTPUT

4-20 mA Output

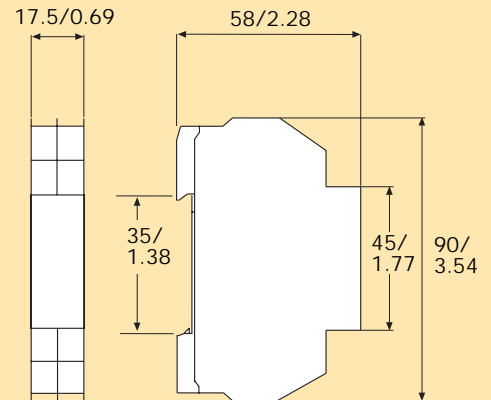


Connections



*) Only 8R

Dimensions

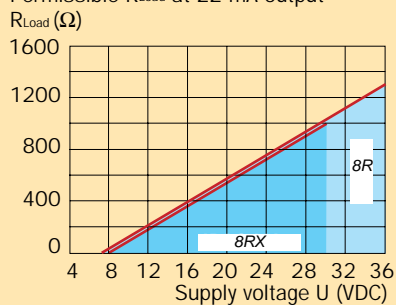


mm / inches

Output load diagram

Fig.4

Permissible R_{Load} at 22 mA output



$$R_{Load} = (U - 7.5) / 0.022 \quad \text{8R}$$

$$R_{Load} = (U - 8.0) / 0.022 \quad \text{8RX}$$



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