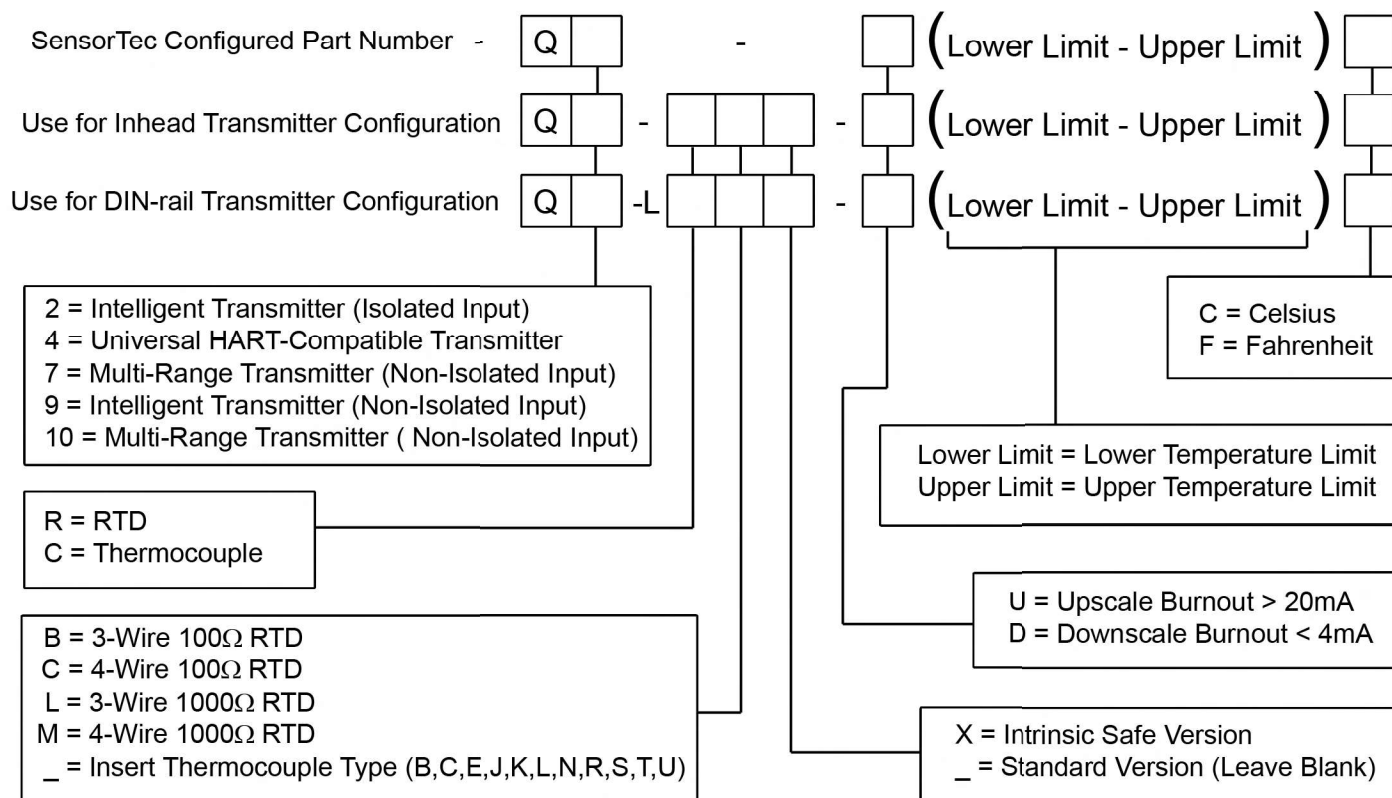


Temperature Transmitters & Instruments Index

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Q4 Universal HART-Compatible Transmitter (Isolated Input)	X4
Q7 Multi-Range Transmitter (Non-Isolated Input).....	X6
Q9 Intelligent Transmitter (Non-Isolated Input)	X8
Q10 Multi-Range Transmitter (Non-Isolated Input)	X10

General Information

Temperature Transmitters & Instruments Section



Q2 / Q2-X



Universal Programmable 2-wire Transmitters



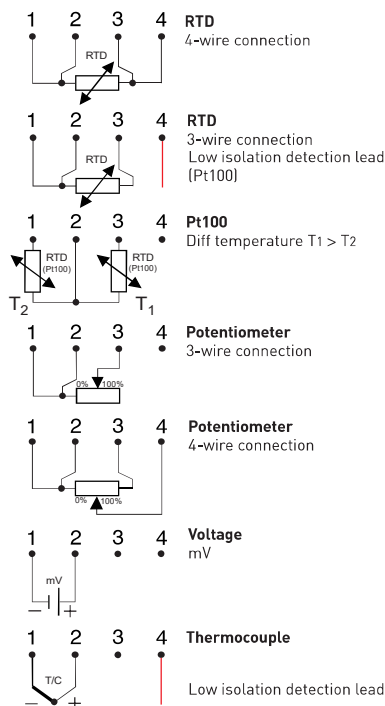
Q2 / Q2-X are universal, isolated 2-wire transmitters for temperature and other measurement applications. They combine competitive pricing, functionality and simple configuration. Useful error correction functions improve the accuracy.

- Fully universal, linearized and high-isolation
- Accepts RTD, T/C, mV and Ω
- Sensor error and system (sensor/transmitter) error correction for highest total accuracy
- Full access to all features while in operation
- NAMUR compliant
- Consistent sensor break function
- Simplified loop check-up with calibration output
- Low sensor isolation detection

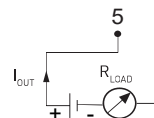
Specifications:

Input RTD		3-, 4-wire connection
Pt100 ($\alpha=0.00385$)		-200 to +1000 °C / -328 to +1832 °F
Pt1000 ($\alpha=0.00385$)		-200 to +200 °C / -328 to +392 °F
PtX $10 \leq X \leq 1000$ ($\alpha=0.00385$)		Upper range depending on X-value
Pt100 ($\alpha=0.003902$)		-200 to +1000 °C / -328 to +1832 °F
Pt100 ($\alpha=0.003916$)		-200 to +1000 °C / -328 to +1832 °F
Ni100 ¹⁾ , Ni120 ²⁾		-60 to +250 °C / -76 to +482 °F
Ni1000 ¹⁾		-100 to +150 °C / -148 to +302 °F
Cu10 ³⁾		-200 to +260 °C / -328 to +500 °F
Input Potentiometer / resistance		3-, 4-wire connection, 0 to 2000 Ω
Input Thermocouples		Types B, C, E, J, K, L, N, R, S, T, U
Input mV		-10 to +500 mV
Sensor failure / Low isolation		User definable output
Adjustments - Zero		Any value within range limits
Adjustments - Minimum spans		
Pt100, Pt1000, Ni100, Ni1000		10 °C / 18 °F
Potentiometer		10 Ω
T/C, mV		2 mV
Output		4-20 / 20-4 mA, temperature linear
Operating temperature		-40 to +85 °C / -40 to +185 °F
Galvanic isolation		1500 VAC, 1 min
Power supply	Q2	6.5 to 36 VDC
	Q2-X	8 to 30 VDC
Intrinsic safety		
Q2-X ATEX:		II 1 G EEx ia IIC T4-T6
Q2-X FM:		IS Class I, DIV 1, GP A-D
Q2-X CSA:		Class I, Groups A-D
Typical accuracy		± 0.1 % of span
Connection head		DIN B or larger

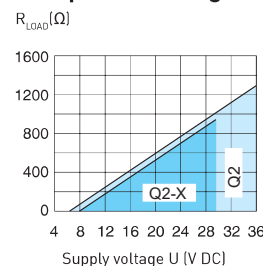
Input connections



Output connections



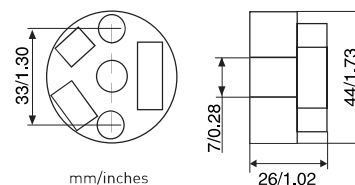
Output load diagram



$$R_{LOAD} = (U - 6.5) / 0.022 \text{ (Q2)}$$

$$R_{LOAD} = (U - 8) / 0.022 \text{ (Q2-X)}$$

Dimensions



¹⁾DIN 43760 ²⁾Edison No. 7 ³⁾Edison No. 15

Q2-L/Q2-LX



Universal Programmable 2-wire Transmitters



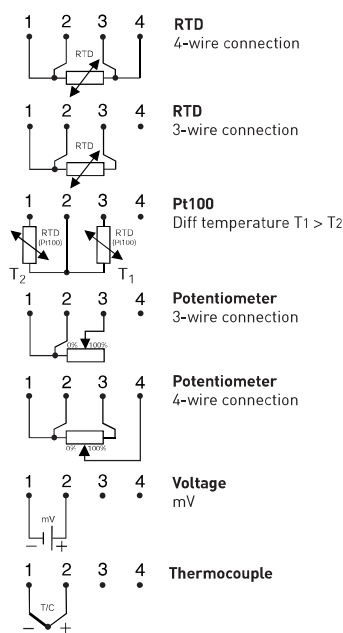
Q2-L/Q2-LX are universal, isolated 2-wire transmitters for temperature and other measurement applications. They combine competitive pricing, functionality and simple configuration. Useful error correction functions improve the accuracy.

- Fully universal, linearized and isolated
- Accepts RTD, T/C, mV and Ω
- Sensor error and system (sensor/transmitter) error correction for highest total accuracy
- Full access to all features while in operation
- NAMUR compliant
- Consistent sensor break function
- Simplified loop check-up with calibration output
- Test output without breaking the loop (Q2-L)

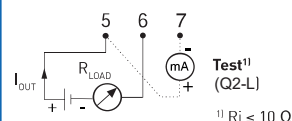
Specifications:

Input RTD		3-, 4-wire connection
Pt100 ($\alpha=0.00385$)		-200 to +1000 °C / -328 to +1832 °F
Pt1000 ($\alpha=0.00385$)		-200 to +200 °C / -328 to +392 °F
PtX $10 \leq X \leq 1000$ ($\alpha=0.00385$)		Upper range depending on X-value
Pt100 ($\alpha=0.003902$)		-200 to +1000 °C / -328 to +1832 °F
Pt100 ($\alpha=0.003916$)		-200 to +1000 °C / -328 to +1832 °F
Ni100 ¹⁾ , Ni120 ²⁾		-60 to +250 °C / -76 to +482 °F
Ni1000 ³⁾		-100 to +150 °C / -148 to +302 °F
Cu10 ³⁾		-200 to +260 °C / -328 to +500 °F
Input Potentiometer/resistance		3-, 4-wire connection. 0 to 2000 Ω
Input Thermocouples		Types B, C, E, J, K, L, N, R, S, T, U
Input mV		-10 to +500 mV
Sensor failure		User definable output
Adjustments-Zero		Any value within range limits
Adjustments-Minimum spans		
Pt100, Pt1000, Ni100, Ni1000		10 °C / 18 °F
Potentiometer		10 Ω
T/C, mV		2 mV
Output		4-20 / 20-4 mA, temperature linear
Operating temperature		-20 to +70 °C / -4 to +158 °F
Galvanic isolation		1500 VAC, 1 min
Power supply	Q2-L	7.5 to 36 VDC
	Q2-LX	8 to 30 VDC
Intrinsic safety (Mounting in safe area)		
Q2-LX ATEX:		II (1) G [EEx ia] IIC
Q2-LX FM:		IS Class I-III, DIV 1, GP A-G
Q2-LX CSA:		Class I, Groups A-D; Class II, Groups E-G; Class III
Typical accuracy		± 0.1 % of span
Mounting		Rail acc. to DIN EN50022, 35 mm

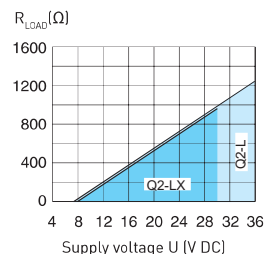
Input connections



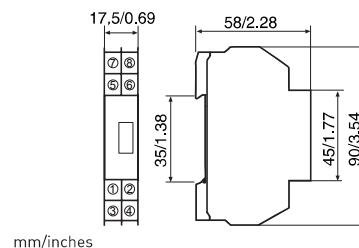
Output connections



Output load diagram



Dimensions





Q4/Q4-X

Universal HART-compatible 2-wire Transmitters



Q4/Q4-X are smart and universal 2-wire in-head transmitters for temperature and other measurement applications. Q4/Q4-X are fully HART-compatible, with communication through the HART protocol.

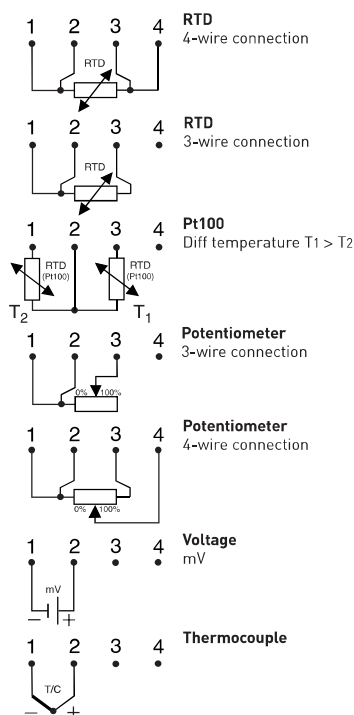
- Utilizes HART Protocol for remote configuration and monitoring
- Communicates with HART Communicator or PC via modem
- Fully universal, linearized and isolated
- Accepts RTD, T/C, mV and Ω
- Sensor error correction
- Easy wiring, large center hole
- 50 point linearization – any sensor can be matched
- Consistent sensor break function
- Full access to all features while in operation
- Low sensor isolation detection
- Integrated in Emerson AMS and Siemens PDM systems

Specifications:

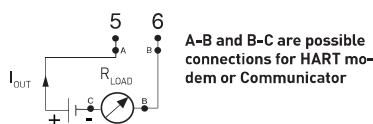
Input RTD and Resistance		3-, 4-wire connection
Pt100 ¹⁾ and D100 ²⁾		-200 to +1000 °C / -328 to +1832 °F
Pt1000 ¹⁾		-200 to +200 °C / -328 to +392 °F
PtX 10 ≤ X ≤ 1000 ¹⁾		Upper range depending on X value
Ni100 ³⁾		-60 to +250 °C / -76 to +482 °F
Ni1000 ³⁾		-60 to +150 °C / -76 to +302 °F
Potentiometer / resistance		0 to 2000 Ω
Input Thermocouples		B, C, E, J, K, L, N, R, S, T, U
Input Voltage		-10 to +500 mV
Sensor failure / Low isolation		User definable output
Adjustments - Zero		Any value within range limits
Adjustments - Minimum spans		
Pt100, Pt1000, Ni100, Ni1000		10 °C / 18 °F
Potentiometer		10 Ω
T/C, mV		2 mV
Output		4-20 / 20-4 mA
Operating temperature		-40 to +85 °C / -40 to +185 °F
Galvanic isolation		1500 VAC, 1 min
Power supply	Q4	10 to 42 VDC
	Q4-X	12 to 30 VDC
Intrinsic safety		
Q4-X ATEX:		II 1 G EEEx ia IIC T4-T6
Q4-X FM:		IS Class I-III, DIV 1, GP A-D, G
Q4-X CSA:		Class I, Groups A-D; Class II, Group G; Class III
Typical accuracy		±0.1% of temperature span
Connection head		DIN B or larger

¹⁾IEC 60751, $\alpha=0.00385$ ²⁾Pt100 acc. to JIS 1604, $\alpha=0.003916$ ³⁾DIN 43760

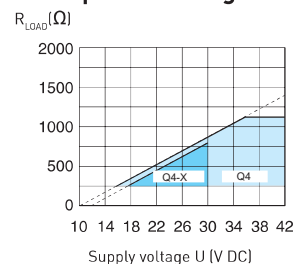
Input connections



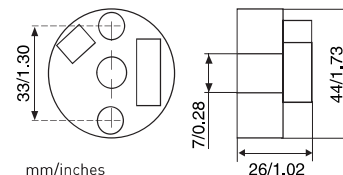
Output connections



Output load diagram



Dimensions



Universal HART-compatible 2-wire Transmitter



Q4-L is a smart and universal 2-wire transmitter for temperature and other measurement applications. Q4-L is fully HART-compatible, with communication through the HART protocol.

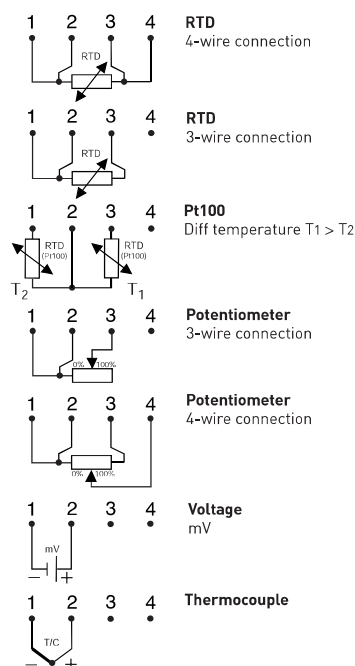
- Utilizes HART protocol for remote configuration and monitoring
- Communicates with HART Communicator or PC via modem
- Fully universal, linearized and isolated
- Accepts RTD, T/C, mV and ohm
- Sensor error correction
- 50 point linearization – any sensor can be matched
- Consistent sensor break function
- Simplified loop check-up with calibration output
- Full access to all features while in operation
- Low sensor isolation detection
- Integrated in Emerson AMS and Siemens PDM systems

Specifications:

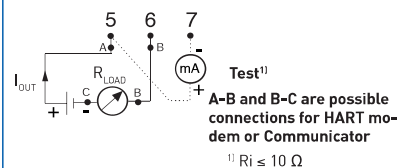
Input RTD and Resistance	3-,4-wire connection
Pt100 ¹⁾ and D100 ²⁾	-200 to +1000 °C / -328 to +1832 °F
Pt1000 ¹⁾	-200 to +200 °C / -328 to +392 °F
PtX 10 ≤ X ≤ 1000 ¹⁾	Upper range depending on X value
Ni100 ³⁾	-60 to +250 °C / -76 to +482 °F
Ni1000 ³⁾	-60 to +150 °C / -76 to +302 °F
Potentiometer / resistance	0 to 2000 Ω
Input Thermocouples	B, C, E, J, K, L, N, R, S, T, U
Input Voltage	-10 to +500 mV
Sensor failure / Low isolation	User definable output
Adjustments – Zero	Any value within range limits
Adjustments – Minimum spans	
Pt100, Pt1000, Ni100, Ni1000	10 °C / 18 °F
Potentiometer	10 Ω
T/C, mV	2 mV
Output	4-20 / 20-4 mA
Operating temperature	-20 to +70 °C / -4 to +158 °F
Galvanic isolation	1500 VAC, 1 min
Power supply	11 to 42 VDC
Typical accuracy	±0.1% of temperature span
Mounting	Rail acc. to DIN EN50022, 35 mm

¹⁾ IEC 60751, α=0,00385 ²⁾ Pt100 acc. JIS 1604, α=0,003916 ³⁾ DIN 43760

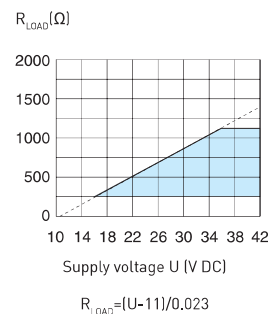
Input connections



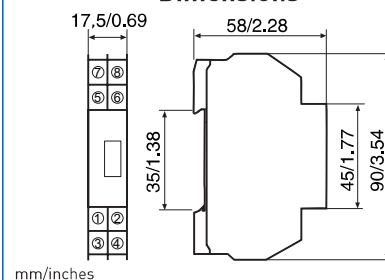
Output connections



Output load diagram



Dimensions



Q7-R/-C

Q7-RX/-CX

Analog Adjustable 2-wire Transmitters



Q7 is a family of multirange 2-wire temperature transmitters for Pt100 or Thermocouple input. Designed for highest reliability and excellent industrial performance. The "low profile" housing is extremely durable and facilitates easy connections and adjustments.

- Rangeable with solderpads and potentiometers
- Temperature linear output for Pt100 (Q7-R/Q7-RX)
- mV linear output for T/C (Q7-C/Q7-CX)
- Consistent sensor break function
- Easy wiring, large center hole
- Moulded electronics for high protection

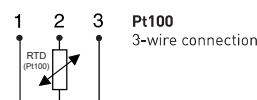
Specifications:

	Q7-R/Q7-RX	Q7-C/Q7-CX
Input	Pt100 ¹ , 3-wire connection	T/C J, L, T, K, N
Adjustments		
Span	50/100/150/200/300/400/500 °C 100/200/300/400/600/800/1000 °F	10 to 50 mV continuously Temperature ranges acc to datasheet
Fine adjustment	±10 %	±10 %
Zero	-50 to + 50 °C -60 to + 120 °F	±10 % of span
Output	4-20 mA	4-20 mA
Linearization	Temperature linear output	mV linear output
Galvanic isolation	No	No
Power supply		
Q7-R/-C	6.5 to 32 VDC	6.5 to 32 VDC
Q7-RX/-CX	8.5 to 30 VDC	8.5 to 30 VDC
Sensor break	Upscale, Downscale	Upscale, Downscale
Intrinsic safety		
Q7-RX/-CX ATEX:	II 1 G EEx ia IIB T4-T6	II 1 G EEx ia IIB T4-T6
Q7-RX/-CX FM:	IS Class 1, DIV 1, GP A-D	IS Class I, Div. 1, GP A-D
Q7-RX/-CX CSA:	Class 1, Groups A-D	Class I, Groups A-D
Operating Temperature	-40 to +85 °C / -40 to +185 °F	-40 to +85 °C / -40 to +185 °F
Typical accuracy	±0.15 % of temperature span	±0.5 % to ±1.0 % of temperature span
Connection head	DIN B or larger	DIN B or larger

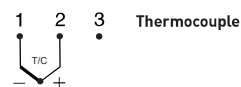
¹IEC 60751, α=0.00385

Input connections

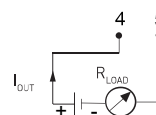
Q7-R/Q7-RX



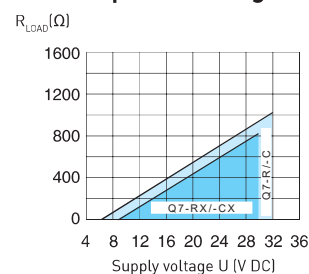
Q7-C/Q7-CX



Output connections



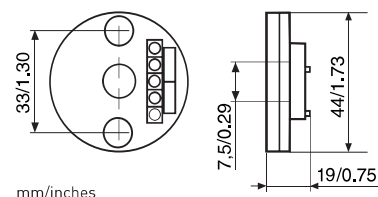
Output load diagram



$$R_{LOAD} = (U - 6.5) / 0.025 \text{ (Q7-R/-C)}$$

$$R_{LOAD} = (U - 8.5) / 0.025 \text{ (Q7-RX/-CX)}$$

Dimensions



Q7-LR Q7-LC



Analog Adjustable 2-wire Transmitters



Q7-LR is a multirange 2-wire temperature transmitter for Pt100 input. Q7-LC is adjustable for 5 different thermocouple types. Q7-LR/LC are designed for highest reliability and excellent industrial performance.

- Rangeable with solderpads and potentiometers
- Temperature linear output for Pt100 (Q7-LR)
- mV linear output for thermocouples (Q7-LC)
- Consistent sensor break function

Specifications:

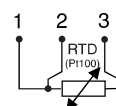
	Q7-LR	Q7-LC
Input	Pt100 ¹⁾ , 3-wire connection	T/C J, L, T, K, N
Sensor break	Upscale, Downscale	Upscale, Downscale
Adjustments		
Span	50/100/150/200/300/400/500 °C 100/200/300/400/600/800/1000 °F	10 to 50 mV continuously Temperature ranges acc. to datasheet
Fine adjustment	±10 %	±10 %
Zero	-50 to +50 °C -60 to +120 °F	±10 % of span
Output	4-20 mA	4-20 mA
Operating Temperature	-20 to +70 °C / -4 to +158 °F	-20 to +70 °C / -4 to +158 °F
Linearization	Temperature linear output	mV linear output
Galvanic isolation	No	No
Power Supply	6.5 to 32 VDC 6.5 to 32 VDC	
Typical accuracy	±0.15 % of temperature span	±0.5 % to ±1.0 % of temperature span
Mounting	Rail acc. to DIN EN50022, 35 mm	Rail acc. to DIN EN50022, 35 mm

¹⁾IEC 60751, $\alpha=0.00385$

Input connections

Q7-LR

Pt100
3-wire connection

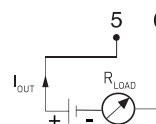


Q7-LC

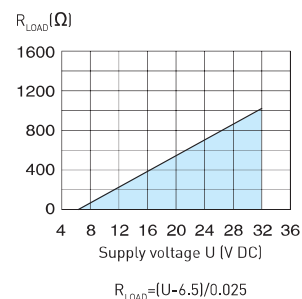
Thermocouple



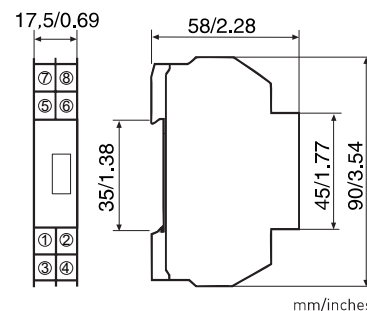
Output connections



Output load diagram



Dimensions



Q9



Basic Programmable 2-wire Transmitter



Q9 is a basic, programmable non-isolated, easy-to-use 2-wire transmitter. The Low Profile housing has a height of only 18.5 mm / 0.72 inch. Configuration is made in seconds with the user friendly Windows software. No external power supply required for configuration. The transmitter is programmable for RTD's in 3- and 4-wire connection according to different standards as well as for 11 T/C types. Useful error correction functions improve the accuracy.

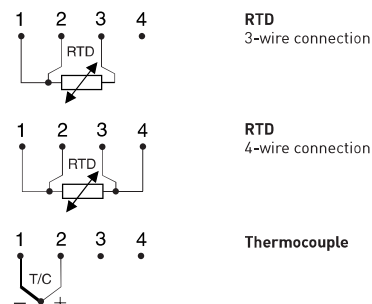
- Robust terminals with test connections
- Only 18.5 mm / 0.72 inch high
- Accepts RTD in 3- and 4-wire connection and 11 T/C types
- Temperature linear output
- Sensor error and system (sensor/transmitter) error correction for highest total accuracy
- Configuration without external power
- Easy-to-use Windows configuration software
- NAMUR compliant
- Rugged design tested for 10 g vibrations
- USB communication

Specifications:

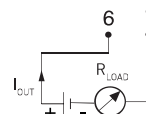
Input RTD	3-, 4-wire connection
Pt100 ($\alpha=0.00385$) ¹⁾	-200 to +1000 °C / -328 to +1832 °F
Pt1000 ($\alpha=0.00385$) ¹⁾	-200 to +200 °C / -328 to +392 °F
PtX $10 \leq X \leq 1000$ ($\alpha=0.00385$) ¹⁾	Upper range depending on X-value
Pt100 ($\alpha=0.003902$)	-200 to +1000 °C / -328 to +1832 °F
Pt100 ($\alpha=0.003916$)	-200 to +1000 °C / -328 to +1832 °F
Ni100 ²⁾	-60 to +250 °C / -76 to +482 °F
Ni1000 ²⁾	-10 to +150 °C / +14 to +302 °F
Ni120 ³⁾	-70 to +300 °C / -94 to +572 °F
Cu10 ⁴⁾	-200 to +260 °C / -328 to +500 °F
Input Thermocouples	
Types	B, C, E, J, K, L, N, R, S, T, U
Sensor failure	Upscale, downscale or off
Adjustments - Zero	Any value within range limits
Adjustments - Minimum spans	
Pt100, Pt1000, Ni100, Ni1000	10 °C / 18 °F
T/C	2 mV
Output	4-20 mA, temperature linear
Operating temperature	-40 to +85 °C / -40 to +185 °F
Galvanic isolation	No
Power supply	8 to 32 VDC
Typical accuracy	±0.15 % of temperature span
Connection head	DIN B or larger

¹⁾ IEC 60751, ²⁾ DIN 43760, ³⁾ Edison No.7, ⁴⁾ Edison No.15

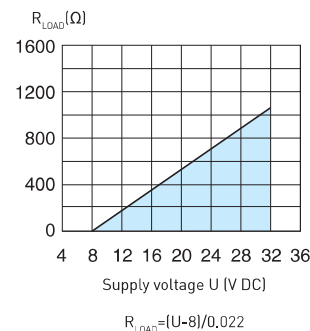
Input connections



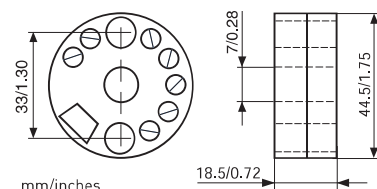
Output connections



Output load diagram



Dimensions



Q9-L



Basic Programmable 2-wire Transmitter



Q9-L is a basic, programmable non-isolated, easy-to-use 2-wire transmitter. Configuration is made in seconds with the user friendly Windows software. No external power supply required for configuration. Q9-L is programmable for RTD's in 3- and 4-wire connection according to different standards as well as for 11 T/C types. Useful error correction functions improve the accuracy.

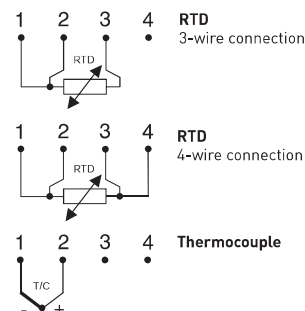
- Accepts RTD in 3- and 4-wire connection and 11 T/C types
- Temperature linear output
- Sensor error and system (sensor/transmitter) error correction for highest total accuracy
- Configuration without external power
- Easy-to-use Windows configuration software
- NAMUR compliant
- Test output without breaking the loop
- USB communication
- Withstands vibrations up to 10 g

Specifications:

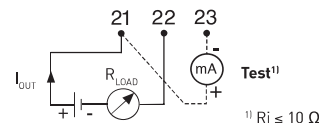
Input RTD	
Pt100 ($\alpha=0.00385$)	3-, 4-wire connection
Pt1000 ($\alpha=0.00385$)	-200 to +1000 °C / -328 to +1832 °F
PtX $10 \leq X \leq 1000$ ($\alpha=0.00385$)	Upper range depending on X-value
Pt100 ($\alpha=0.003902$)	-200 to +1000 °C / -328 to +1832 °F
Pt100 ($\alpha=0.003916$)	-200 to +1000 °C / -328 to +1832 °F
Ni100 ²⁾	-60 to +250 °C / -76 to +482 °F
Ni1000 ²⁾	-10 to +150 °C / +14 to +302 °F
Ni120 ³⁾	-70 to +300 °C / -94 to +572 °F
Cu10 ⁴⁾	-200 to +260 °C / -328 to +500 °F
Input Thermocouples	
Types	B, C, E, J, K, L, N, R, S, T, U
Sensor failure	Upscale, downscale or off
Adjustments - Zero	Any value within range limits
Adjustments - Minimum spans	
Pt100, Pt1000, Ni100, Ni1000	10 °C / 18 °F
T/C	2 mV
Output	4-20 mA, temperature linear
Operating temperature	-20 to +70 °C / -4 to +158 °F
Galvanic isolation	No
Power supply	8 to 32 VDC
Typical accuracy	± 0.15 % of temperature span
Mounting	Rail acc. to DIN EN 50022, 35 mm

¹⁾ IEC 60751, ²⁾ DIN 43760, ³⁾ Edison No.7, ⁴⁾ Edison No.15

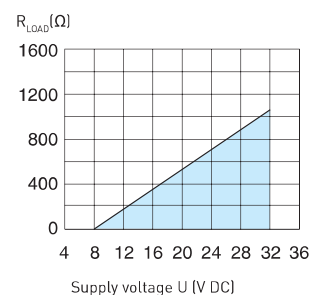
Input connections



Output connections

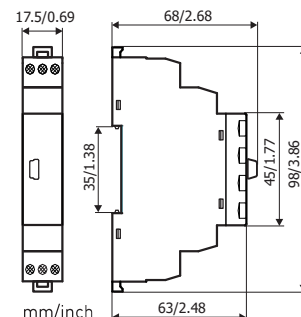


Output load diagram



$$R_{LOAD} = (U - 8) / 0.022$$

Dimensions



Q10



Analog Adjustable 3-wire Transmitters



Q10 is a multirange 3-wire temperature transmitter with Pt100 or Pt1000 input and 0-10 V output.

Main applications are in the HVAC sector, where the control systems often require 0-10 V input signals.

Q10 is designed for high reliability and good industrial performance.

The “low profile” housing is extremely durable and facilitates easy connections and adjustments.

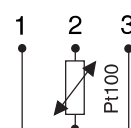
- 0-10 V output
- Rangeable with solder pads and potentiometers
- Temperature linear output
- Selectable sensor break function
- Short-circuit protected output
- Polarity protected power supply
- Easy wiring, large center hole
- Moulded electronics for high protection

Specifications:

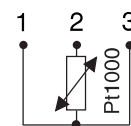
	Q10 (Pt100)	Q10 (Pt1000)
Input	Pt100 ¹⁾ , 3-wire connection	Pt1000 ¹⁾ , 3-wire connection
Maximum lead resistance	11 Ω / wire	11 Ω / wire
Sensor break	Upscale (>11 V), Downscale (0 V)	Upscale (>11 V), Downscale (0 V)
Adjustments		
Span	50/100/150/200 °C 100/200/300/400 °F	50/100/150/200 °C 100/200/300/400 °F
Fine adjustment	±10 %	±10 %
Zero	-50 to +50 °C -60 to +120 °F	-50 to +50 °C -60 to +120 °F
Output	0-10 V, 3-wire connection	0-10 V, 3-wire connection
Minimum load	10 k Ω	10 k Ω
Short-circuit protection	Yes	Yes
Operating Temperature	-40 to +85 °C / -40 to +185 °F	-40 to +85 °C / -40 to +185 °F
Linearization	Temperature linear output	Temperature linear output
Galvanic isolation	No	No
Power Supply	15 to 30 VDC (polarity protected)	15 to 30 VDC (polarity protected)
Current consumption	12 mA	12 mA
Typical accuracy	±0.15 % of temperature span	±0.15 % of temperature span
Connection head	DIN B or larger	DIN B or larger

¹⁾ IEC 60751, $\alpha=0.00385$

Input connections

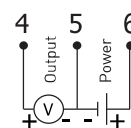


Q10 (Pt100)
Pt100
3-wire connection

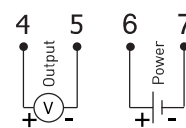


Q10 (Pt1000)
Pt1000
3-wire connection

Output & power supply connections

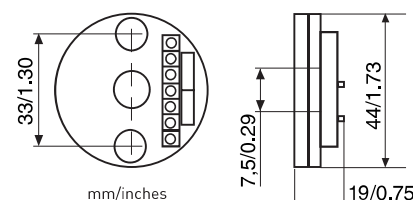


Alternative 1



Alternative 2

Dimensions



Q10-L



Analog Adjustable 3-wire Transmitters



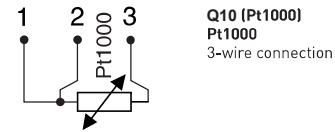
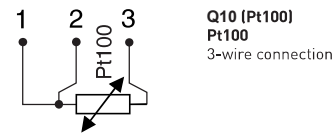
Q10 is a multirange 3-wire temperature transmitter with Pt100 or Pt1000 input and 0-10 V output. Main applications are in the HVAC sector, where the control systems often require 0-10 V input signals. Q10 is designed for high reliability and good industrial performance.

- 0-10 V output
- Rangeable with solder pads and potentiometers
- Temperature linear output
- Selectable sensor break function
- Short-circuit protected output
- Polarity protected power supply

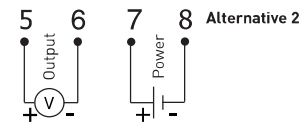
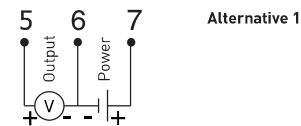
Specifications:

	Q10 (Pt100)	Q10 (Pt1000)
Input	Pt100 ¹⁾ , 3-wire connection	Pt1000 ¹⁾ , 3-wire connection
Maximum lead resistance	11 Ω / wire	11 Ω / wire
Sensor break	Upscale (>11 V), Downscale (0 V)	Upscale (>11 V), Downscale (0 V)
Adjustments		
Span	50/100/150/200 °C 100/200/300/400 °F	50/100/150/200 °C 100/200/300/400 °F
Fine adjustment	±10 %	±10 %
Zero	-50 to +50 °C -60 to +120 °F	-50 to +50 °C -60 to +120 °F
Output	0-10 V, 3-wire connection	0-10 V, 3-wire connection
Minimum load	10 k Ω	10 k Ω
Short-circuit protection	Yes	Yes
Operating Temperature	-20 to +70 °C / -4 to +158 °F	-20 to +70 °C / -4 to +158 °F
Linearization	Temperature linear output	Temperature linear output
Galvanic isolation	No	No
Power Supply	15 to 30 VDC (polarity protected)	15 to 30 VDC (polarity protected)
Current consumption	12 mA	12 mA
Typical accuracy	±0.15 % of temperature span	±0.15 % of temperature span
Mounting	Rail acc. to DIN EN50022, 35 mm	Rail acc. to DIN EN50022, 35 mm

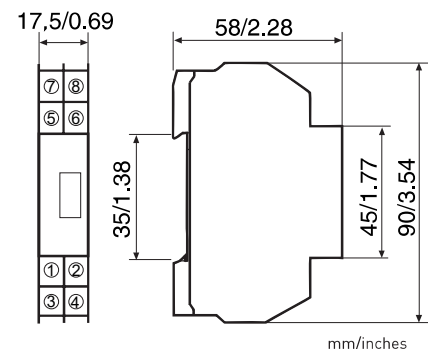
Input connections



Output & power supply connections



Dimensions



¹⁾ IEC 60751, $\alpha=0.00385$

