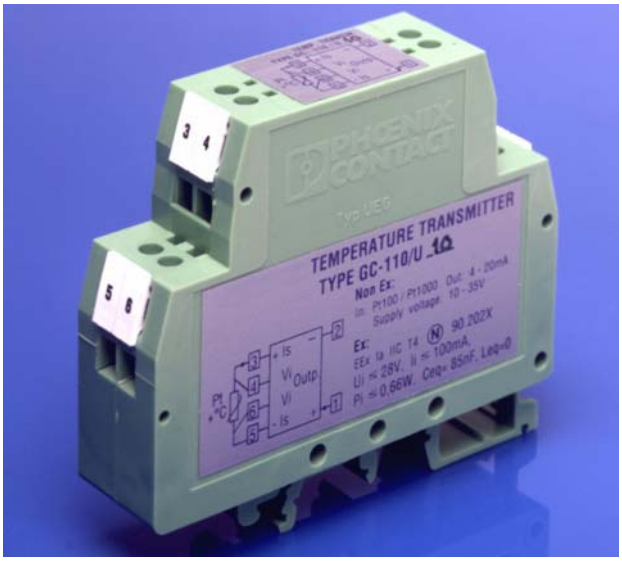
GC-110

KONGSBERG

Temperature Transmitter

Features

- Easy and economical installation
- Designed in a terminal block housing
- Mounted directly on a TS-32 or TS-35 rail
- Two-wire principle. Power and output signal via the same wires
- Can also be mounted in hazardous areas by means of zener barriers
- Excellent price/performance ratio



Description

Application and general description

The GC-110 Temperature Transmitter amplifies and linearizes the resistance change in a Pt100 and Pt1000 temperature-sensing element. The transmitters are used for temperature measurements in the –200 to +600 °C range.

The GC-110 Temperature Transmitter is designed according to the 2-wires principle, i.e. the power supply and the output signal are transmitted via the same two wires. This makes mounting easy and economical. Power/output wires are transient protected according to IEC 60.

The temperature transmitter is housed in a terminal block, so it can be easily mounted directly on TS-32 and TS-35 mounting rails. End stoppers for groups of transmitters must be installed at both ends of the group.

The temperature is measured by means of a Pt100 or Pt1000 sensing element and converted to an output signal, which varies linearly with the temperature. The temperature transmitters are pre-adjusted, and the standard ranges are stated in the ordering type code. The GC-110 Temperature Transmitter is designed for 4-wire connection to the temperature sensor, and the effect of cable resistance is negligible. If the distance between the sensor and the transmitter is 100 m with 4-wire 0.5 mm^2 cable, the error will be approximately 0.1 % of full range.

If there is any breakage in one or more of the input wires between the transmitter and the sensing element, the output signal will either increase above 25 mA or decrease below 3.6 mA.

The transmitter can also be mounted in hazardous areas. The installation is the made intrinsically safe by transmitting the power supply/output signal through the DZ-110 Zener Barriers or equivalent.

Electrical connection

The GC-110 unit must be mounted in a steel cabinet, alone or together with outer equipment, i.e. the DZ-110 Zener Barrier for EEx ia use.

A Cu-screened cable with intact screen must always be used from the transmitter to the GC-110 unit. Minimum cross cable is 2 x 0.5 mm^2. The Cu-screen must be grounded as near to the inlet in the cabinet with the GC-110 unit as possible.

If the output signal from the GC-110 unit is transferred to a monitoring system, it must be used a cable with Cu-screen, minimum 0.5 mm^2. The Cu-screen must be grounded in both ends as near to the inlet in the cabinet with the GC-110 units in one end and as near the inlet to the monitoring system in the other end, as possible.

	GC-110	GC-110 with DZ-110 Zener Barrier
Power supply:	24 VDC (11 to 35 VDC)	24 VDC (18 to 35 V)
Output signal:	4 to 20 mA	4 to 20 mA
Sensor fault:	I_{out} <3.6 mA or 25 to 33 mA	I_{out} <3.6 mA or 25 to 33 mA
Protection:	-	EEx ia IIC
Load:	0 to 1200 Ω, see Fig. 2.	0 to 650 Ω at 18 V input
Maximum cable length when used in IIC area:	-	Approximately 200 m

Sensor element:	Pt100Ω/0 °C or Pt1000Ω/0 °C, according to IEC 751/DIN 43760
Ambient temperature:	-25 °C to +70 °C
Accuracy** (signal converter without Pt100 element):	< ±0.25 % of FRO*
Temperature drift:	< ±0.01 % of FRO* /°C
Generic EMC standard:	Emission: EN 50081-1 Immunity: EN 50082-2 Performance degradation during immunity test: <1.5 % of FRO (Crit. A)
Connections:	Screw terminals, maximum 2.5 mm^2
Weight:	0.5 kg
Types:	See “Order key” inside this data sheet.

** FRO = Full Range Output*
*** Accuracy = Including non-linearity, hysteresis and repeatability at 25 °C*

Accuracy, sensors:	Temperature	Class B (standard)	Class A (upon request)
Element Pt 100 or Pt1000	-100 °C	±0.8 °C	±0.35 °C
	0 °C	±0.3 °C	±0.15 °C
According to IEC 751	100 °C	±0.8 °C	±0.35 °C
	200 °C	±1.3 °C	±0.55 °C
	400 °C	±2.3 °C	±0.95 °C
	600 °C	±3.3 °C	±1.35 °C

Improved accuracy is achieved by immersing the sensor tip (minimum 8 cm) into a mixture of crushed ice and water in a thermos flask. Adjust the output signal until I_{out} corresponds to 0 °C. Estimated total accuracy at approximately 0 °C should now be better than 0.2 °C.

Safety Data

Input terminals No. 1-2:	
Maximum input voltage:	U_i = 28 V
Maximum input current:	I_i = 130 mA
Maximum input power:	P_i = 0.9 W
Equivalent internal capacitance:	C_i = 53 nF
Equivalent internal inductance:	L_i = 5 µH
Output terminals for sensing element:	
Maximum output power:	P_0 = 0.75 W
Maximum external capacitance:	C_0 of the safety barrier – 83 nF (nominal internal capacitance of the transmitter) = maximum external capacitance of the GC-110

Drawings

Fig. 1: The GC-110

Based on dwg. no. GC-189

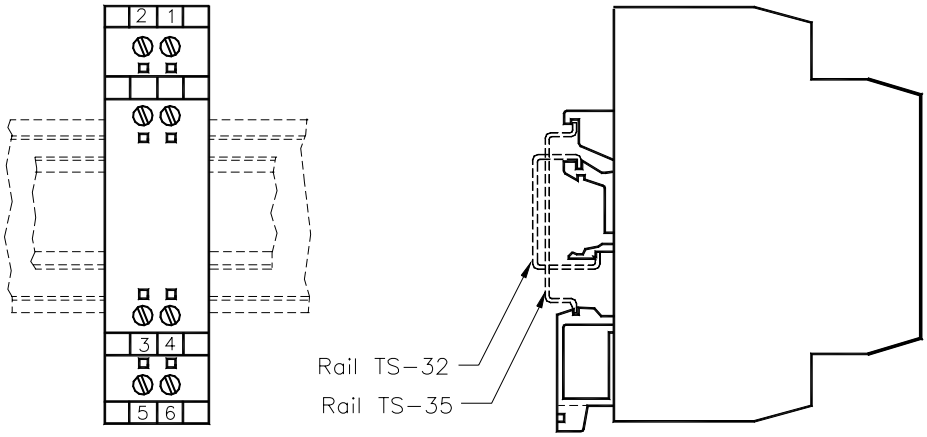
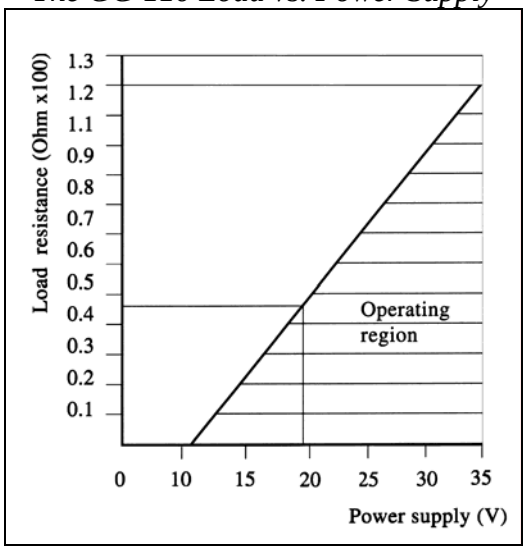


Fig. 2:
The GC-110 Load vs. Power Supply



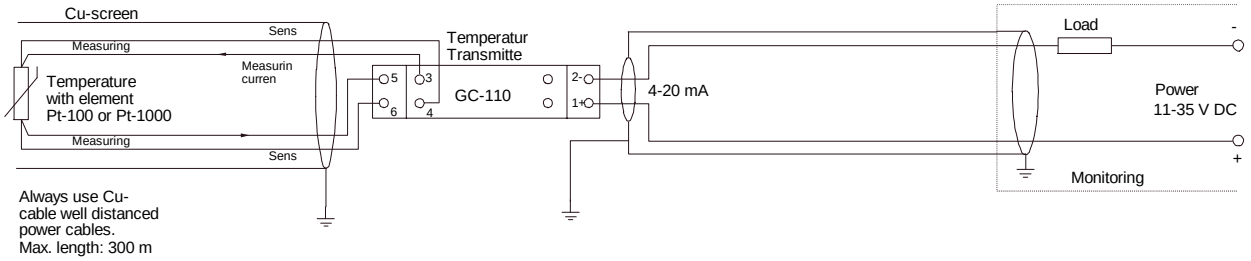
Order key:

Type Code: GC-110/____

Measuring range:	Element type: Pt100	Pt1000
-200 to + 200 °C	**U10**	**U20**
-50 to +50 °C	**U11**	**U21**
0 to +160 °C	**U12**	**U22**
0 to +300 °C	**U13**	**U23**
0 to +600 °C	**U14**	**N/A**
0 to +100 °C	**U15**	**U25**
-50 to +100 °C	**U16**	**U26**

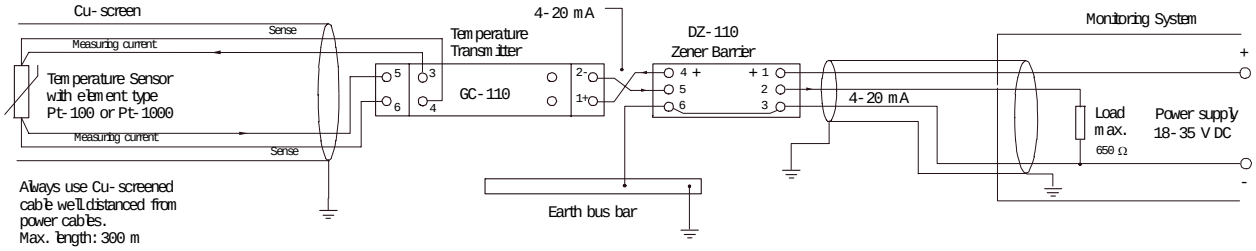
Example:
The **GC-110/U12** is a Temperature Transmitter connected to a Pt-100 element, with a temperature range of 0 to +160 °C.

Fig. 3: The GC-110, electric connection



Based on dwg. no. GC-188

Fig. 4: The GC-110, electric connection in hazardous areas



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