GC-100

KONGSBERG

Temperature Transmitter

Features

- Temperature sensor with built-in signal converter
- 2-wire principle, 4 to 20 mA
- Easy and economical installation
- The GC-100/S version for safe areas
- The GC-100/Ex version for hazardous areas

Description

Application and general description

The GC-100 Temperature Transmitter is used for temperature measurement in the -200 °C to +600 °C range. It is designed on the 2-wire principle, i.e. the 11 to 35 V power supply and the 4 to 20 mA output signal are transmitted over the same two wires. This makes installation easy and economical.

The temperature is measured by means of a Pt100 (IEC 751) sensor element encapsulated in the sensor tip and converted to a 4 to 20 mA output signal, which varies linearly with the temperature. Power/output wires are transient protected according to IEC 60 (50 KV/0.57).

The GC-100 Temperature Transmitter consists of one GCA-100 Signal Converter where all the electronic components are encapsulated, and one stainless steel temperature sensor with threads fastened to a dusty- and splash-proof encapsulation, including the converter. The sensor and converter comprise a common unit, designated GC-100. The signal converter is pre-adjusted and the standard ranges are stated in the type code key.

If one or more of the input wires breaks between the signal converter and the sensor element, the output signal will either increase over 25 mA (maximum 33 mA) or decrease below 3.6 mA.

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

Electrical connection

A Cu-screened cable with intact screen must always be used from the transmitter to the monitoring system. Minimum cross cable is 2 x 0.5 mm^2. The Cu-screen must be grounded in the PG16 cable gland on the transmitter, see fig. 1. On the monitoring side the screen must be grounded as near to the inlet in the monitoring cabinet/system as possible.

Technical specifications

	GC-100	GC-100 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 T6
Load:	0 to 1200 Ω see Fig. 3.	0 to 650 Ω at 18 V input

Sensor element:	Pt100Ω/0 °C according to IEC 751/DIN 43760
Accuracy** (signal converter without Pt100 element):	<±0.25 % of FRO*
Temperature drift:	<±0.01 % of FRO* /°C
Ambient temperature:	-25 °C to + 70 °C
Generic EMC standard:	Emission: EN 50081-1 Immunity: EN 50082-2 Performance degradation during immunity test: <0.5 % of FRO (Crit. A)
Encapsulation:	IP55 (the GC-100 standard version)
Connections:	Mantle blocks maximum 2.5 mm^2
Weight:	0.5 kg

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

Accuracy, sensors:	Temperature	Class B (standard)	Class A (standard)
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 = 30 V
Maximum input current:	I_i = 150 mA
Maximum input power:	P_i = 0.9 W
Equivalent int. capacitance:	C_i = 53 nF
Equivalent int. inductance:	L_i = 10 µH

Fig. 1: The GC-100

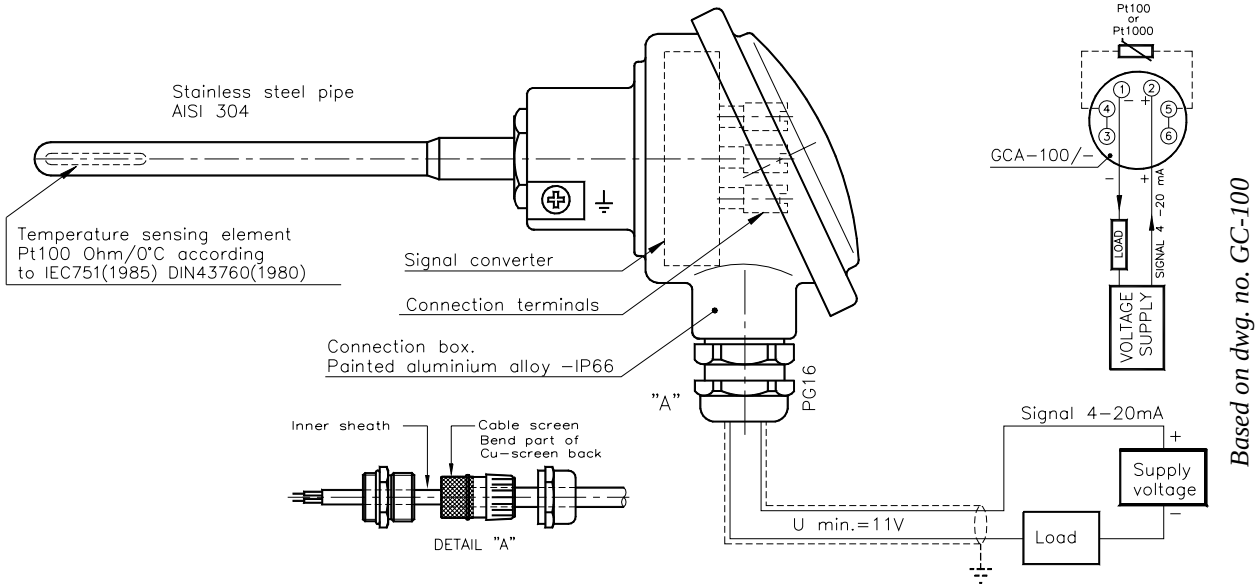


Fig. 2: The GCA-100

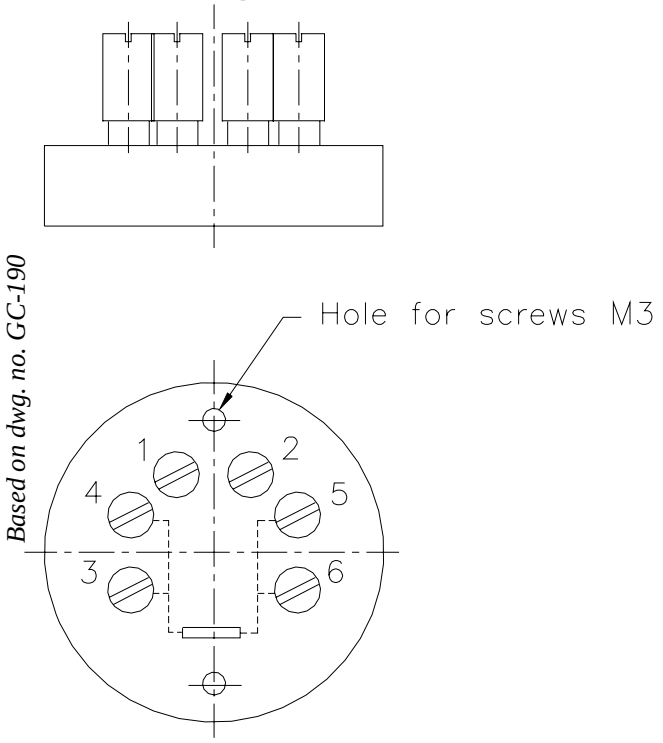
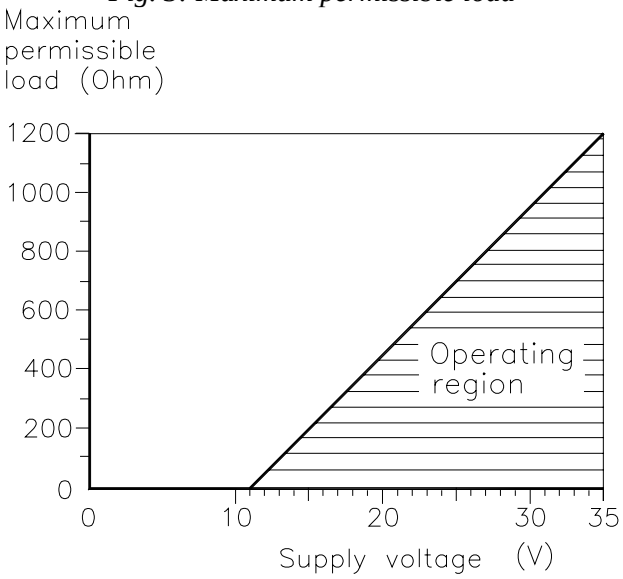


Fig. 3: Maximum permissible load



The maximum permissible load resistance is set by the value of the voltage as shown above.

Type code key:

GC-10□ / □ - □ - □

Mechanical design:

0. Connection box in Al-alloy, IP55 — dwg. no.: GC-100
1. Connection box in Al-alloy, IP55, spring-loaded — dwg. no.: GC-101
2. Connection box in AISI 316, IP66, spring-loaded — dwg. no.: GC-102
3. Connection box in AISI 316, IP66 — dwg. no.: GC-103

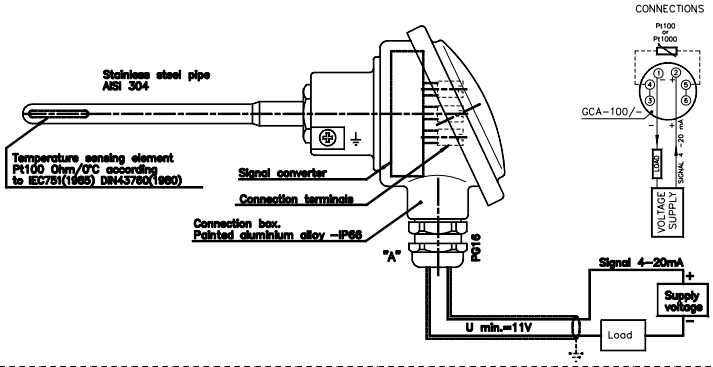
Ex= EEx ia version
S= Standard version

Input lengths (80, 120, 150, 200 or 250 mm)

Measuring range:

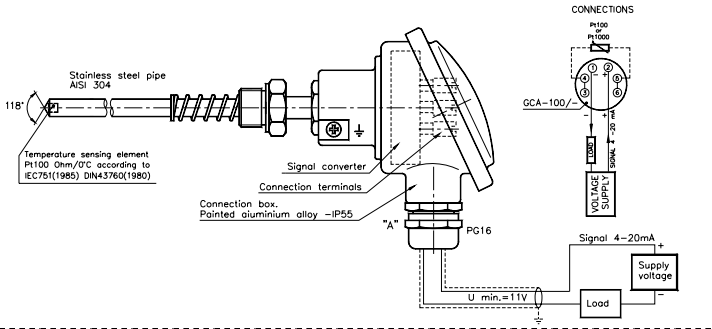
U10 = -200 to +200 °C
U11 = -50 to +50 °C
U12 = 0 to +160 °C
U13 = 0 to +300 °C
U14 = 0 to +600 °C
U15 = 0 to +100 °C
U16 = -50 to +100 °C

Fig. 4: The GC-100



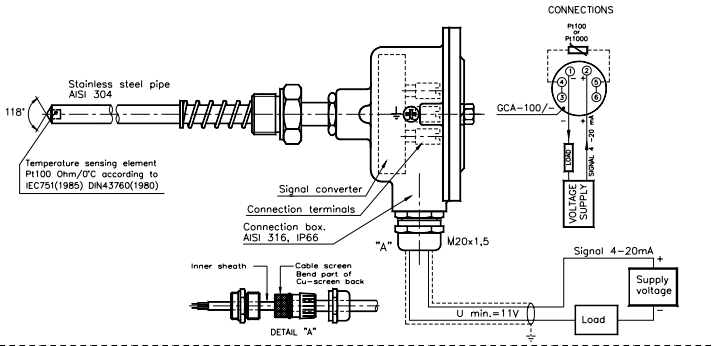
Based on dwg. no. GC-100

Fig. 5: The GC-101



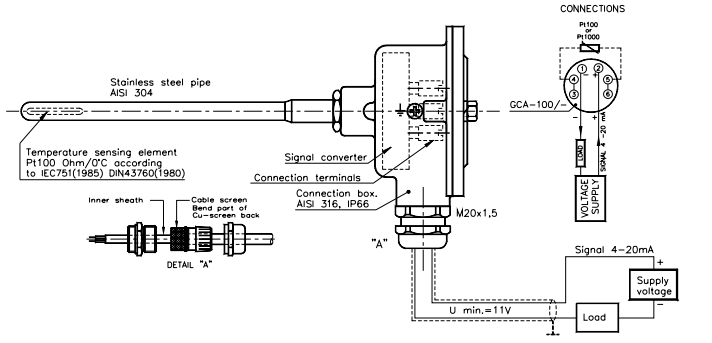
Based on dwg. no. GC-101

Fig. 6: The GC-102



Based on dwg. no. GC-102

Fig. 7: The GC-103



Based on dwg. no. GC-103

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