GN-100

KONGSBERG

Thermocouple Amplifier

Features

- Built-in temperature sensor for compensation of cold-point-junction variations
- Available in different standard temperature ranges adjusted by the producer

Description

Application and general description

The GN-100 Thermocouple Amplifier converts (amplifies) the low voltage output from a thermocouple (approximately 40 µV/°C when using a 'K' element) to a standard 4 to 20 mA signal using a 2-wire connection.

The GN-11/2K-- electronic circuitry, (Fig. 1) is moulded in a PPT/PET blended housing using Gella, and only the connecting terminals are accessible.

The GN-11/2K-- unit are mounted in a silumin enclosure. The GN-11/2K-- and the silumin enclosure comprise a complete GN-100 unit (Fig. 2).

Electrical design

Voltage supply must be between 12 and 35 VDC, and the lower voltage must be determined by the load resistance at the output (Fig. 2, 3, 4). The input voltage is dependent on the temperature difference between the sensor element (hot junction) and the amplifier (cold junction). A built-in temperature sensor will compensate for variations in the amplifiers ambient temperature (cold junction).

Electric connection (Fig. 2 & 3)

A cable with flexible steel protection must always be used from the sensor to the amplifier. The flexible steel protection must be terminated in the GN-100 cable gland. Standard cable gland M20, M16 option.

A screened cable to be used from the amplifier to the monitoring system. Minimum cross section is 2 x 0.5 mm^2. The monitoring screen must be connected to ground as close as possible to the inlet of the AMS cabinet

Functional control

The converter/amplifier is calibrated/adjusted from the factory, and further adjustment is not required. Functional control is carried out according to the following procedure:

1. Disconnect the sensor leads from terminal nos. 3(+) and 5(-).
2. Short circuit the sensor input, terminal nos. 3 and 5.
3. Connect a mA-meter in series with one of the leads to the supplied power, 1(+) or 2(-).

4. The signal current will correspond to the ambient temperature of the amplifier (the thermocouple voltage is 0 µV).
5. A 4 mA signal corresponds to 0 °C, while 20 mA corresponds to full range. The correct signal current can be calculated as follows:

Example:
GN-100/A, range 0-600 °C. T_{amb} = 30 °C.

$$I_{out} = 4 + \frac{(20 - 4)*30}{600} = 4.8 \text{ mA}$$

$$I_{out} = 4 + \frac{(20 - 4)*T_{amb}}{\text{Range}} \text{ (mA)}$$

Technical specifications

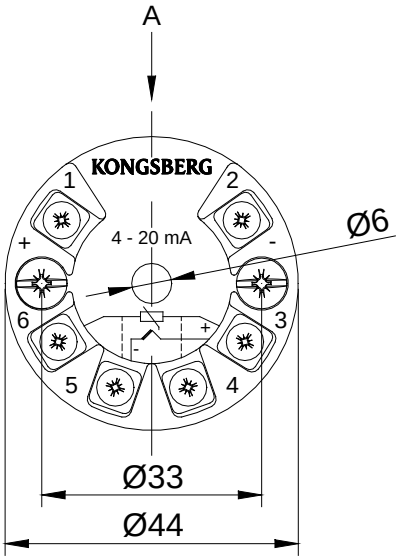
	GN-100/--
Power supply	24 VDC (12 to 35 V)
Output signal	4 to 20 mA / 2-wire
Load	0 to 1000 Ohm (35 V)
Weight	Approximately 600 g
Enclosure	IEC 60529 IP 56
Cable gland types	Standard M20x1,5 (7-13 mm)
	Option M16x1,5 (4-10 mm)

	GN-11/2K--
Accuracy Thermocouple at 25 °C	±2 °C (ITS-90)
Output shift by ambient temperature	±0.005 % FRO /°C Ref. at 25 °C
Operating ambient temperature	-40 to +125 °C
Humidity	97 % relative, IEC 60068-2-30
Vibration	IEC 60068-2-6. ±8 mm 3-25 Hz, 10G 25-100 Hz.
EMC standard	Cispr 16-1, 16-2 IEC 61000
Emission	EN 50081-1
Immunity	EN 50082-2
Connection	0.5 to 2.5 mm²
Performance degradation during immunity test	<±0.5 % FRO (1 % 1 GHz to 2 GHz)
Types	See “Order key”
Material, moulding enclosure	PPT/PET Blend
Moulding	3M GELLA 8882D
Terminals	M3 screws zinc-plated yellow (Max. torque 1NM (PZ1)

Art. no. Standard types	**Element type**	**Range**
GN-100/E	’K’ NiCr-NiAl	0 to 160 °C
GN-100/B	’K’ NiCr-NiAl	0 to 300 °C
GN-100/A	’K’ NiCr-NiAl	0 to 600 °C
GN-100/N	’K’ NiCr-NiAl	0 to 900 °C
GN-100/G	‘J’ Fe-Const.	0 to 300 °C
GN-100/F	‘J’ Fe-Const.	0 to 600 °C

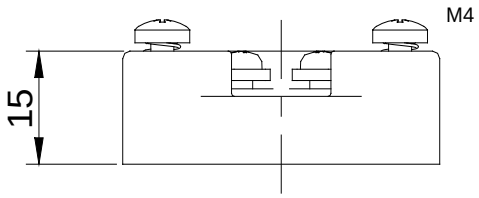
Drawings

Fig. 1



GN-11/-- top view

Seen from A



GN-11/-- side view

Fig. 2

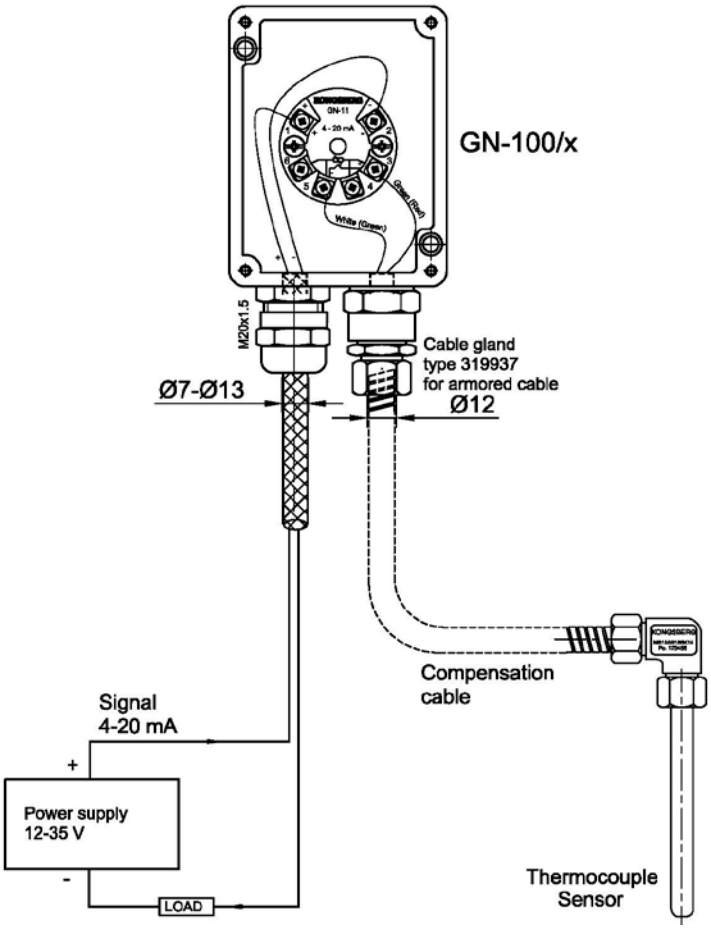


Fig. 3

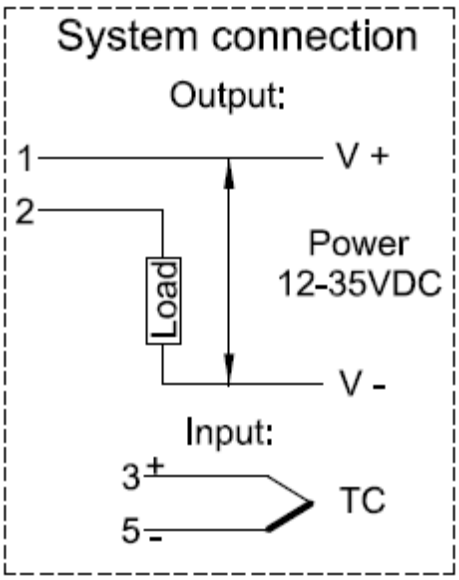
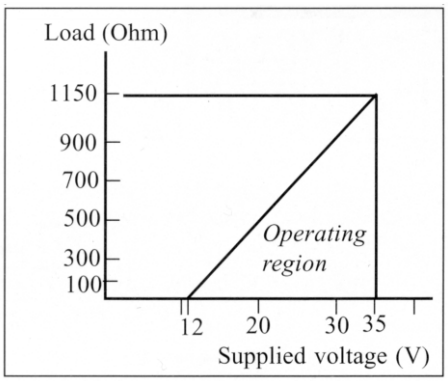


Fig. 4



Maximum permissible load

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