GREISINGER electronic

Technical Information

GITT01, GITT01 - Ex

Universal head transmitter for resistance thermometers (RTD), thermocouples, resistance and voltage transmitters, PC programmable, for installation in a terminal head form B

Application

- PC programmable (PCP) temperature head transmitter for converting various input signals into an scalable 4 to 20 mA analog output signal
- Input:
  Resistance thermometer (RTD)
  Thermocouple (TC)
  Resistance transmitter (Ω)
  Voltage transmitter (mV)
- Online configuration using PC with configuration kit

Your benefits

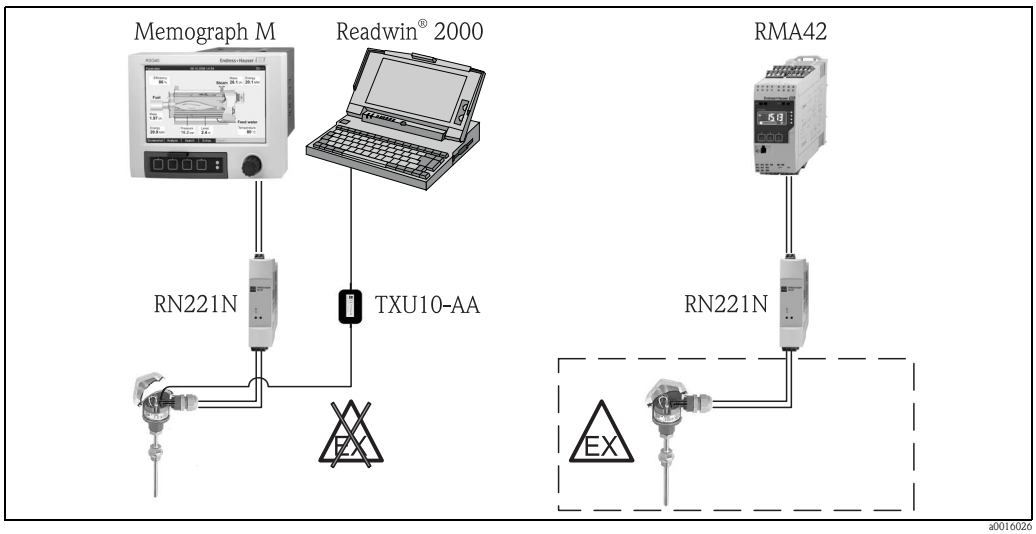
- Universally PC programmable for various signals
- 2 wire technology, 4 to 20 mA analog output
- High accuracy in total ambient temperature range
- Fault signal on sensor break or short circuit, presettable to NAMUR NE 43
- EMC to NAMUR NE 21, CE
- UL recognized component to UL 3111-1
- GL Germanischer Lloyd marine approval
- Ex certification
  - ATEX Ex ia and dust ex zone 22 in compliance with EN 50281-1
  - FM IS
  - CSA IS
- Galvanic isolation
- Online configuration during measurement using SETUP connector
- Customer-specific linearization
- Adjustment of characteristic curve
- Output simulation

TI00070R/09/EN/01.11
51001110

Function and system design

Measuring principle

Electronic measurement and conversion of input signals in industrial temperature measurement.



Application example GITT01

Measuring system

The GITT01 temperature head transmitter is a two wire transmitter with an analog output. It has measurement input for resistance thermometers (RTD) in 2-, 3- or 4-wire connection, thermocouples and voltage transmitters. Setting up of the device is done using the configuration kit.

Input

Input signal

Resistance thermometer (RTD)

	Type	Measurement ranges		min. measurement range
as per IEC 751 (α = 0.00385)	Pt100 Pt500 Pt1000	-200 up to 850 °C -200 up to 250 °C -200 up to 250 °C)	(-328 up to +1562 °F) (-328 up to +482 °F) (-328 up to +482 °F	10 K (18 °F) 10 K (18 °F) 10 K (18 °F)
as per DIN 43760 (α = 0.00618)	Ni100 Ni500 Ni1000	-60 up to 180 °C -60 up to 150 °C -60 up to 150 °C	(-76 up to +356 °F) (-76 up to +302 °F) (-76 up to +302 °F)	10 K (18 °F) 10 K (18 °F) 10 K (18 °F)
Connection type		2-, 3- or 4-wire connection cable resistance compensation possible in the 2 wire system (0 up to 20 Ω).		
Sensor cable resistance		max. 11 Ω per wire		
Sensor current		≤ 0.6 mA		

Resistance transmitter (Ω)

Type	Measurement ranges	min. measurement range
Resistance (Ω)	10 up to 400 Ω 10 up to 2000 Ω	10 Ω 100 Ω

Thermocouple (TC)

	Type	Measurement ranges		min. measurement range
as per NIST Monograph 175, IEC 584	B (PtRh30-PtRh6)[1)] E (NiCr-CuNi) J (Fe-CuNi) K (NiCr-Ni) N (NiCrSi-NiSi) R (PtRh13-Pt) S (PtRh10-Pt) T (Cu-CuNi)	0 up to +1820 °C -200 up to +915 °C -200 up to +1200 °C -200 up to +1372 °C -270 up to +1300 °C 0 up to +1768 °C 0 up to +1768 °C -200 up to +400 °C	(32 up to 3308 °F) (-328 up to 1679 °F) (-328 up to 2192 °F) (-328 up to 2501 °F (-454 up to 2372 °F) (32 up to 3214 °F) (32 up to 3214 °F) (-328 up to 752 °F)	500 °C (900 °F) 50 °C (90 °F) 50 °C (90 °F) 50 °C (90 °F) 50 °C (90 °F) 500 °C (900 °F) 500 °C (900 °F) 50 °C (90 °F)
as per ASTME E988	C (W5Re-W26Re) D (W3Re-W25Re)	0 up to 2320 °C 0 up to 2495 °C	(32 up to 4208 °F) (32 up to 4523 °F)	50 °C (90 °F) 50 °C (90 °F)
as per DIN 43710	L (Fe-CuNi) U (Cu-CuNi)	-200 up to +900 °C -200 up to +600 °C	(-328 up to 1652 °F) (-328 up to 1112 °F)	50 °C (90 °F) 50 °C (90 °F)
w/o	MoRe5-MoRe41	0 up to 2000 °C	(32 up to 3632 °F)	500 °C (900 °F)
Cold junction		internal (Pt100) or external (0 up to 80 °C (32 up to 176 °F))		
Accuracy of cold junction		± 1 K (± 1.8 °F)		
Sensor current		30 nA		

1) Higher measurement error for temperatures below 300 °C (572 °F).

Voltage transmitter (mV)

Designation	Measurement ranges	min. measurement range
Millivolt transmitter (mV)	-10 up to 100 mV	5 mV

Output

Output signal

Current output

4 up to 20 mA, 20 to 4 mA

Signal on alarm

Measurement range undercut	linear drop to 3.8 mA
Exceeding measurement range	linear rise to 20.5 mA
Sensor breakage, sensor short circuit[1)]	≤ 3.6 mA or ≥ 21.0 mA

1) Not for thermocouple

Load

Max. load: $(V_{supply} - 8\ V) / 0.025\ A$

Transmission behavior

Temperature linear, resistance linear, voltage linear

Galvanic isolation

I/O: U = 2 kV AC

Filter

1st degree digital filter: 0 up to 8 s

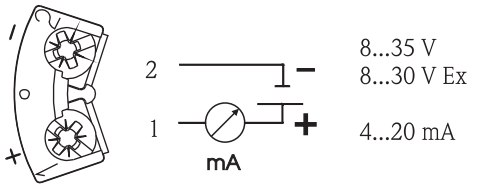
Current limit ≤ 25 mA

Switch-on delay 4 s (I_a = 3.8 mA during swich-on)

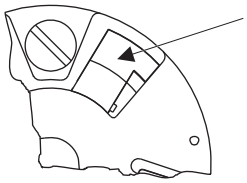
Power supply

Terminal assignment

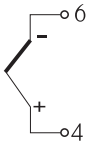
Voltage supply and current output

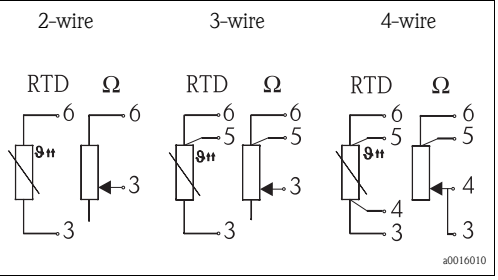


SETUP connector



Sensor connection





Supply voltage 8 up to 35 V DC, polarity protected
Ex version: 8 up to 30 V DC

Residual ripple Permissible residual ripple USS ≤ 5 V at Ub ≥ 13 V, f_{max} = 1 kHz

Performance characteristics

Response time 1 s

Reference operating conditions Calibration temperature 23 °C ± 5 K (73.4 °F ± 9 °F)

Maximum measured error

Resistance thermometer (RTD)

Type	Measurement accuracy 1)
Pt100, Ni100	0.2 K (0.36 °F) or 0.08 %

1) % is related to the adjusted measurement range (the value to be applied is the greater).

Resistance transmitter (Ω)

Type	Measurement accuracy 1)	Measurement range
Resistance	± 0.1 Ω or 0.08 %	10 up to 400 Ω
	± 1.5 Ω or 0.12 %	10 up to 2000 Ω

1) % is related to the adjusted measurement range (the value to be applied is the greater).

Thermocouple (TC)

Type	Measurement accuracy [1]
K, J, T, E, L, U N, C, D S, B, R, MoRe5MoRe41	typ. 0.5 K (0.8 °F) or 0.08 % typ. 1.0 K (1.8 °F) or 0.08 % typ. 2.0 K (3.6 °F) or 0.08 %
Influence of the internal reference junction	Pt100 DIN IEC 751 Kl. B

1) % is related to the adjusted measurement range (the value to be applied is the greater).

Voltage transmitter (mV)

Type	Measurement accuracy [1]	Measurement range
Millivolt transmitter	± 20 µV or 0.08 %	-10 up to 100 mV
Influence of the supply voltage	≤ ± 0.01 %/V deviation from 24 V [2]	
Influence of the load	≤ ± 0.02 %/100 Ω [2]	

1) % is related to the adjusted measurement range (the value to be applied is the greater).

2) All data is related to a measurement end value (FSD) of 20 mA.

Long-term drift

0.1 K/year (0.18 °F/year) [1] or 0.05 %/year [1][2]

Influence of ambient temperature

T_d = temperature drift
$\Delta\vartheta$ = deviation of ambient temperature from reference condition
For temperatures in °F, divide the result by 1.8.

Resistance thermometer (RTD):

$T_d = \pm$ (15 ppm/K * max. measurement range + 50 ppm/K * preset measurement range) * $\Delta\vartheta$

Resistance thermometer Pt100:

$T_d = \pm$ (15 ppm/K * (range end value+200) + 50 ppm/K * preset measuring range) * $\Delta\vartheta$

Thermocouple (TC):

$T_d = \pm$ (50 ppm/K * max. measurement range + 50 ppm/K * preset measurement range) * $\Delta\vartheta$

Installation

Mounting location

Terminal head as per DIN EN 50446 Form B; field housing TAF10

Orientation

No restrictions

1) under reference conditions
2) % is related to the adjusted measurement range (the value to be applied is the greater).

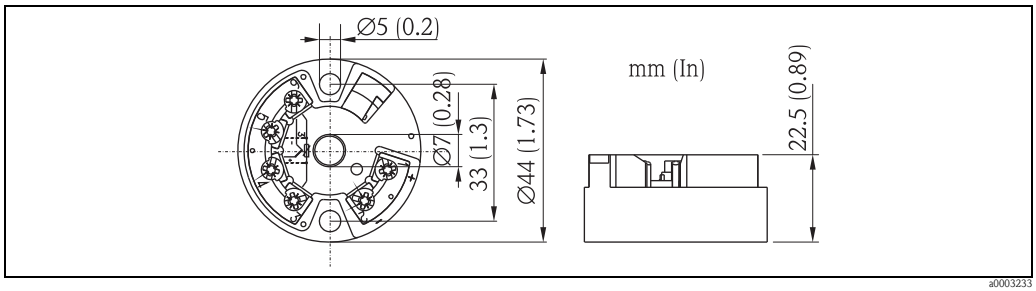
Environment

Ambient temperature range
–40 up to +85 °C (–40 up to +185 °F) (for Ex-areas, see Ex-certification or control drawings)

Storage temperature
–40 up to +100 °C (–40 up to +212 °F)

Mechanical construction

Design, dimensions



Dimensions of the head transmitter

Weight
40 g (1.41 oz.)

Materials
Housing: PC
Potting: PUR

Terminals
Cable up to max. 1.75 mm² (16 AWG)

Operability

Operating concept

Remote operation

Configuration kit
Interface cable plus PC software Readwin® 2000
Interface: PC interface connection cable TTL -/- RS232 with plug
Configurable parameters: sensor type and connection type, measurement dimension (°C/°F), measurement ranges, internal/external cold junction, compensation of cable resistance for 2-wire connection, signal on alarm, output signal (4 up to 20 mA/20 to 4 mA), digital filter (damping), offset, measurement point identification (8 characters), output simulation.

Certificates and approvals

CE mark
This unit complies with the legal requirements laid out within the EU regulations.

Ex approval
All relevant data for hazardous areas can be found in separate Ex documentation. If required, please request copies from us.