

# Operating Instructions Melt Temperature Sensor

## TF



Certified to  
ISO 9001

**Please study these operating instructions carefully before connecting or operating the equipment.**

### Contents:

1. Application and designated area of application
2. Identification data
3. Safety and disposal
4. Electrical connection
5. Dimensions
6. Fitting and removal
7. Order specification

### 1. Application and designated area of operation

Gneuss melt temperature sensors are designed for temperature measurement of liquid, doughy or paste-like melts up to a temperature of 450°C (PT100 350°C). They do not have any negative influence on the production process. The media must be homogeneous. Further, the measuring tip length has to be selected in accordance with the melt viscosity and the channel diameter.

Any application deviating from this area of operation is designated unsuitable. Should the use of the sensor for unsuitable applications result in any damage, the manufacturer cannot be held responsible. This is exclusively the responsibility of the operator.

### 2. Identification data

Sensor:	insulated thermocouple or RTD
Material in contact with media:	Steel grade 1.4305, optional Steel grade 1.4542 or 2.4610
Thermal conductivity values:	Shaft and measuring tip: 15 W / m x K Insulating sleeve: 2,5 W / m x K (version TF-CX...)
Insulation resistance of the Measuring element:	20° C: Approx. 200 MOhm at 100 V 350° C: 20 - 40 MOhm at 100 V
Max. melt pressure:	2000 bar / 29000 PSI
Accuracy class:	Thermocouple: Class 2 (optional 1) according to DIN EN 60584 PT100: Class B (optional A) according to DIN EN 60751

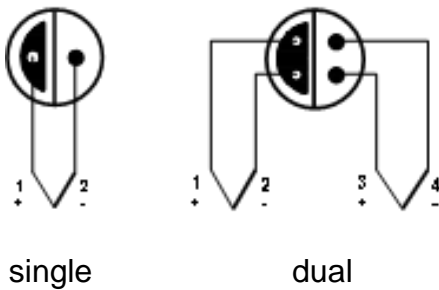
### 3. Safety and disposal

The unit is built according to the latest state of technology and is therefore reliable in operation. There is, however, a permanent danger of burns due to hot components. The unit does not contain toxic or water-polluting materials and therefore does not need to be disposed of as special waste. Further, no materials harmful to the ozone layer are used for the manufacture of these sensors.

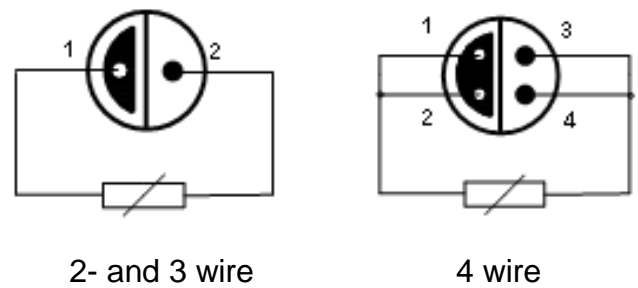
### 4. Electrical connection

#### 4.1 Goldcontact version 2G or 4G

Thermocouple



Resistance thermometer PT 100

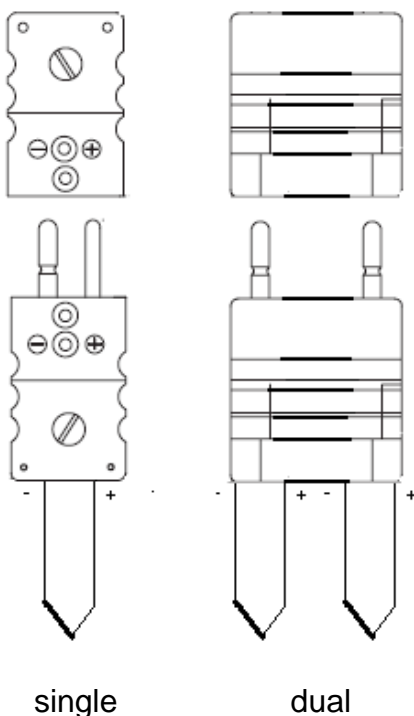


Connecting socket: Lemos a ERA 2S 302 CLL, 2-pole or  
Lemos a ERA 2S 304 CLL, 4-pole

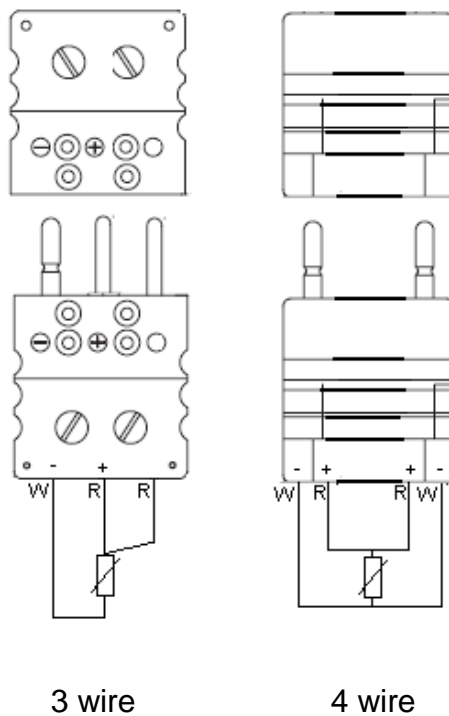
Cable plug: Lemos a FFA 2S 302 CLAL 52 Z, 2-pole or  
Lemos a FFA 2S 304 CLAL 52 Z, 4-pole

#### 4.2 Thermocouple connector version

Thermocouple



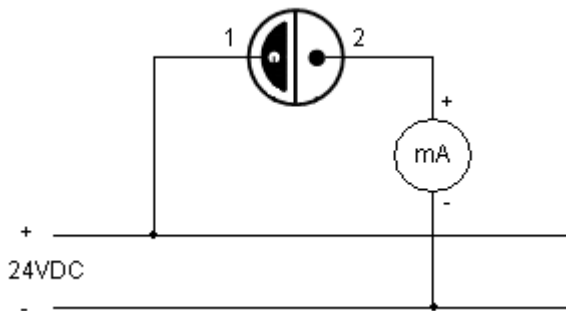
Resistance thermometer PT 100



### 4.3 Version with 4...20 mA output TF-XX-XXX-XXX-XX-XX-2MA-2G-XXX

#### Technical data of integrated amplifier:

Measuring range: 0...350 °C  
 Output signal: 4...20 mA 2-wire  
 Supply: 15...35 VDC, max. ripple <10%  
 Max. working resistance: 250 Ohm at 15 V supply  
 750 Ohm at 25 V supply  
 1250 Ohm at 35 V supply  
 Malfunction: Sensing element fracture output > 20mA  
 Sensor short circuit output < 4mA  
 EMC emission: According to EN 61000-6-3:2001  
 EMC stability: According to EN 61000-6-2:2001



Connecting socket:

Lemosa ERA 2S 302 CLL, 2-pole

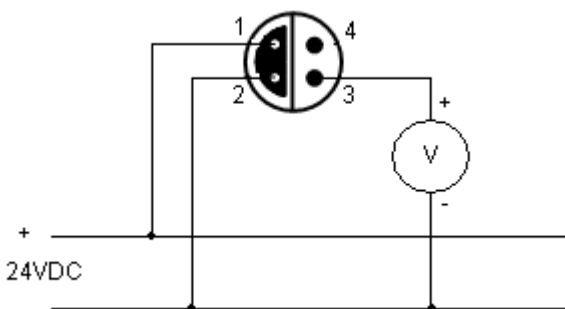
Cable plug:

Lemosa FFA 2S 302 CLAL 52 Z, 2-pole

### 4.4 Version with 0...10 V output TF-XX-XXX-XXX-XX-XX-VDC-4G-XXX

#### Technical data of integrated amplifier:

Measuring range: 0...350 °C  
 Output signal: 0...10V 3/4-wire  
 Supply: 15...35 VDC, max. ripple <10%  
 Max. consumption: 10 mA  
 Malfunction: Sensing element fracture output > 10V  
 Sensor short circuit output = 0 V  
 EMC emission: According to EN 61000-6-3:2001  
 EMC stability: According to EN 61000-6-2:2001



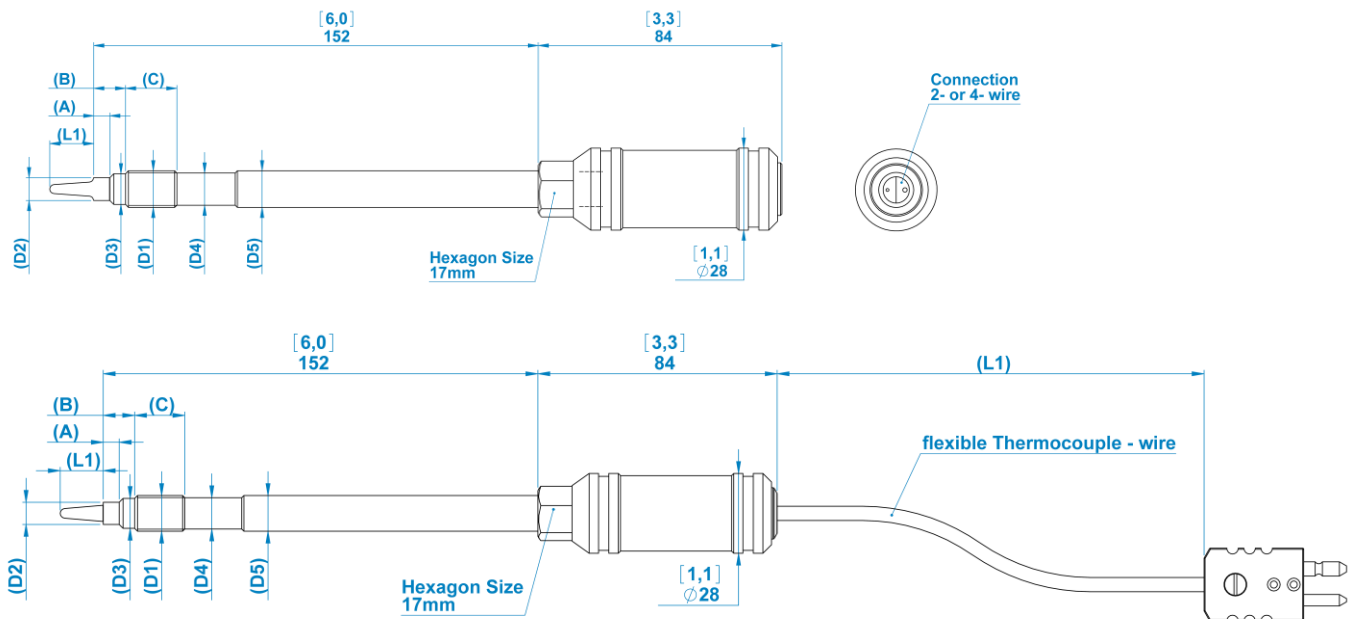
Connecting socket:

Lemosa ERA 2S 304 CLL, 4-pole

Cable plug:

Lemosa FFA 2S 304 CLAL 52 Z, 4-pole

### 5. Dimensions



D1	D2	D3	D4	D5	A	B	C	SW	L1
M18x1,5	10 <sup>-0,05</sup>	16 <sup>-0,1</sup>	16 <sup>-0,5</sup>	16	6 <sup>-0,25</sup>	14	20	17	0/5/10/
1/2"20UNF 2A	7,8 <sup>-0,5</sup>	10,5 <sup>-0,05</sup>	10,5 <sup>-0,5</sup>	12,5	5,6 <sup>-0,1</sup>	10,8	17	17	15/20/2 5

For available shaft length see order specification

### 6. Fitting and removal

#### Fitting of the melt temperature sensor

Before fitting the unit, please make sure that the installation dimensions of the sensor drilling are absolutely in accordance with the given specification. Further, it is important that there are no melt residues or dirt in the drilling. To ensure that the sensor can easily be screwed in, we recommend to apply heat-resistant grease to the sensor before fitting it and to check the sensor drilling by means of a test bolt. This bolt (which can be provided by Gneuß) is made of stainless steel, so that it can also be used as blanking plug. The melt temperature sensor should be screwed in by hand until the sealing surfaces (45° surfaces) make contact. The max. permissible tightening torque is 30 Nm for 1/2" threads.

#### Removal of the melt temperature sensor

In order to avoid damage to the sensor, it may not be removed during the melt being cold. We therefore recommend to remove the sensor while the machine is still warm.

### Order specification TF-XX Melt temperature sensors

Order specification	TF																				
<b>Standard version</b>																					
<input type="checkbox"/> <b>Version</b>	TF																				
<input type="checkbox"/> ceramically isolated measuring tip		C	X																		
<input type="checkbox"/> <b>Measuring tip in steel construction</b>		M	X																		
<b>Process connection</b>																					
<input type="checkbox"/> 1/2" UNF 2A								1	2	A											
<input type="checkbox"/> M18 x 1,5 A								1	8	A											
<b>Sensor tip length [mm]</b>																					
<input type="checkbox"/> 0mm								0	0												
<input type="checkbox"/> 5mm								0	5												
<input type="checkbox"/> 10mm								1	0												
<input type="checkbox"/> 15mm								1	5												
<input type="checkbox"/> 20mm								2	0												
<input type="checkbox"/> 25mm								2	5												
<input type="checkbox"/> Special length								1	9												
<b>Sensor tip material</b>																					
<input type="checkbox"/> Stainless steel (standard)																				S	
<input type="checkbox"/> Stainless steel (martensitic)																				R	
<input type="checkbox"/> Alloy C4																				H	
<input type="checkbox"/> Stainless steel/GX-Coating																				B	
<input type="checkbox"/> Special material																				Y	
<b>Shaft length [rigid]</b>																					
<input type="checkbox"/> 152 mm, 6" (Standard)																				S 0	
<input type="checkbox"/> 203 mm, 8,0"																				S 1	
<input type="checkbox"/> 254 mm, 10,0"																				S 2	
<input type="checkbox"/> 318 mm, 12,5"																				S 3	
<input type="checkbox"/> 356 mm, 14,0"																				S 4	
<input type="checkbox"/> 406 mm, 16,0"																				S 5	
<input type="checkbox"/> 456 mm, 18,0"																				S 6	
<input type="checkbox"/> 76 mm, 3,0"																				S 8	
<input type="checkbox"/> Special shaft length																				S 9	
<b>Exit junction</b>																					
<input type="checkbox"/> no cable exit — Plug connection	*2																			F 0	
<input type="checkbox"/> Cable exit 100 mm, 4"	*10																			F 1	
<input type="checkbox"/> Cable exit 1016 mm, 400"	*10																			F 2	
<input type="checkbox"/> Cable exit 3000 mm, 1181"	*10																			F 3	
<input type="checkbox"/> BUZ-head	*7																			F 4	
<input type="checkbox"/> Special length																				F 9	
<b>Sensor element + output signal</b>																					
<input type="checkbox"/> Thermocouple Type J (simplex)	*1																			T 1 J	
<input type="checkbox"/> Thermocouple Type L (simplex)	*1																			T 1 L	
<input type="checkbox"/> Thermocouple Type K (simplex)	*1																			T 1 K	
<input type="checkbox"/> Thermocouple Type J (duplex)	*3																			T 2 J	
<input type="checkbox"/> Thermocouple Type L (duplex)	*3																			T 2 L	
<input type="checkbox"/> Thermocouple Type K (duplex)	*3																			T 2 K	
<input type="checkbox"/> RTD PT100 2-Wire system	*1																			P T 2	
<input type="checkbox"/> RTD PT100 3-Wire system																				P T 3	
<input type="checkbox"/> RTD PT100 4-Wire System	*3																			P T 4	
<input type="checkbox"/> 4-20mA 2-wire EX approved (BUZ)	*6+4																			E X A	
<input type="checkbox"/> 4-20mA 2-wire	*6+8																			2 M A	
<input type="checkbox"/> 0-10V	*6+9																			V D C	
<input type="checkbox"/> Special output signal																				9 9 9	
<b>Electrical Connection</b>																					
<input type="checkbox"/> 2-pole, goldcontacts																					2 G
<input type="checkbox"/> 4-pole, goldcontacts																					4 G
<input type="checkbox"/> 2-pole Thermocouple connector																					2 T
<input type="checkbox"/> 3-pole Thermocouple connector																					3 T
<input type="checkbox"/> 4-pole Thermocouple connector																					4 T
<input type="checkbox"/> open cable end																					L O
<input type="checkbox"/> terminal screw	*5																				S K
<b>Special design</b>																					
<input type="checkbox"/> without																					0 0 0
<input type="checkbox"/> Customer specific construction																					X X X

- \*1 Electrical connection "2G" or "2T"
- \*2 Electrical connection "2G" or "4G"
- \*3 Electrical connection "4G" or "4T"
- \*4 Electrical connection "SK"
- \*5 Only in conjunction with "F4 BUZ-head"
- \*6 Only with RTD PT100 3-wire
- \*7 Only in conjunction with rigid shaft
- \*8 Electrical connection "2G"
- \*9 Electrical connection "4G"
- \*10 Electrical connection "2T", "3T", "4T" or "LO"



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