GHMGROUP
Specialists by Competence.

GTL, HTK
Датчики температуры для пищевой и фармацевтической промышленности GHM MESSTECHNIK

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Астрахань (8512)99-46-04
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http://ghm.nt-rt.ru || gmg@nt-rt.ru

Features

System
- Temperature probes / - switches,
- hygienic design

Process connections
- M12, G ½, G ½ (flush mounted), G ½ standard
- G ⅜ union nut, without thread, clamp-on adapter (no media contact)

Temperature range
- -40..+200 °C
- CIP- / SIP- capable

High flexibility
- Modular design,
- probe length acc. to customer specification

Accuracy
- Class A or better

Programming tool
- Parameters freely programmable via GTL - Configuration tool

Field of application

- **Food and beverage industry**
- **Breweries**
- **Dairies**
- **Chemical industry**
- **Pharmaceutical industry**
- **Cosmetics industry**
- **Biotechnology**

System features
Our products largely meet the specific requirements of the food, beverage and pharmaceutical industry.
- „Hygienic Design“ for cleaning and sterilization processes
- CIP- / SIP- capable
- Probes made of stainless steel
- FDA conform materials
- EHEDG certificate (in preparation)

Advantages
- Temperature range -40..+200 °C
- Several design types
- Optional with integrated transducer and on-site display
- Short response time due to tapered measuring tip
- High accuracy (class A, class AA, others upon request)
- Certificate of calibration available
- Variable fitting length
- Protection class IP67 / IP69K
- Available with calibration certificate
- Optionally with acceptance test certificate 3.1 acc. to EN 1020 for part in contact with media

Measuring probes
- Process connection M12, G½″ or without thread but with compression fitting
- Compact design
- Design types with neck tube available
- Electric connection via M12-plug, M16 x 1.5 (PG) or fixed cable
- Front-flush installation and several probe lengths depending on
- design type
- Several probe lengths and diameters
- Process connection and protection tube made of stainless steel
- 1.4404
- Clamp-on probes, fast responding, for DN 10..80

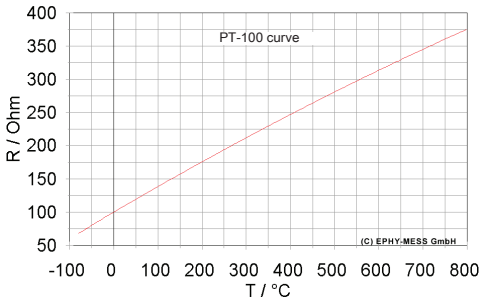
Measuring principle for Pt100

The correlation between temperature and resistance is not directly proportional, but includes terms of higher order.

R(t) = R0 (1+ A*t + B*t2 + C*t3 + ...)

Pt100 values:

-40 °C	84,27
-20 °C	92,16
0 °C	100,00
20 °C	107,79
40 °C	115,54
60 °C	123,24
80 °C	130,90
100 °C	138,51
120 °C	146,07
140 °C	153,58
160 °C	161,05



Other used Pt elements:

Pt500 (0 °C = 500 Ω)

Pt1000 (0 °C = 1000 Ω)

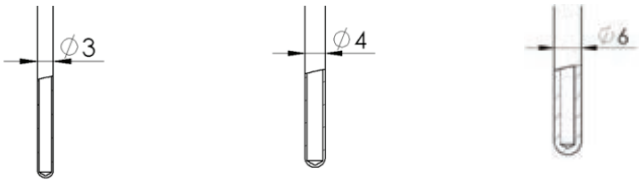
Accuracy classes of Pt elements:

Pt100 / Pt1000:

Sensor accuracies acc. to EN 60751:2008

DIN Klasse	Validity range	Accuracy
DIN Kl. A	-30..+300 °C	±0,15 °C at 0 °C
DIN Kl. AA = 1/3 DIN Kl. B	0..150 °C	±0,1 °C at 0 °C

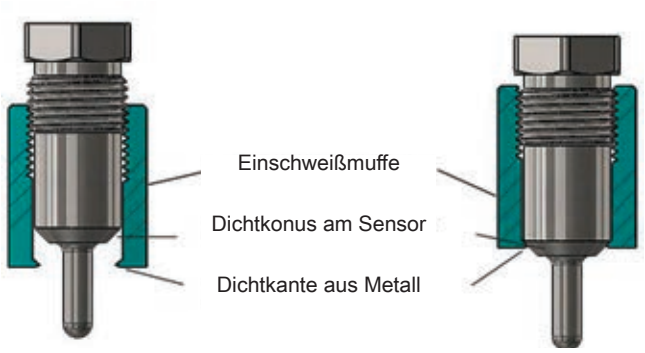
Response time



T_{90} ≤ 1,5 s T_{90} ≤ 3,6 s T_{90} ≤ 7,4 s

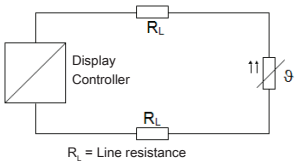
Process connection

Principle of elastomer and dead-space-free process connection

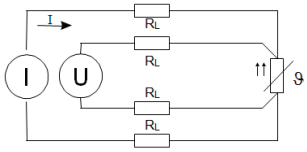


Electrical connection

2-wire technology



3-/4-wire technology



I = constant IRL = IPt100
voltage measurement via
separate circuit.
The equation R = U / I allows
the determination of measuring
resistance

Design types (basic version)

Overview. temperature sensors without / with transducer (head transmitter)

Field housing without on-site display	Field housing with on-site display	Compact design with M12- plug	Compact design with M12- plug and transducer	Compact design with cable fixed	Compact design with fixed cable and transducer
					
M12 hygienic	G ½ hygienic	G ½ flush mounted	G ½ standard	without thread	G ⅜

Product overview

Type	Process connection							Design	Electric connection	Page
	M12	G ½	G ½ flush mounted	G ½ standard	without thread	G ⅜ union nut	Clamp-on			
Temperature probes (*optionally with transducer / integrated on-site display)										
GTL142	•							Ø 59 mm probe head * Ø 59 mm probe head with neck tube *	M12 orPG	6
GTL162 **GTL162M** **GTL182** **GTL182M**	• • • •							Ø 18 mm probe head Ø 18 mm probe head incl. transducer Ø 18 mm probe head Ø 18 mm probe head incl. transducer	M12 M12 PG PG	9
GTL240				•				Ø 59 mm probe head * Ø 59 mm probe head with neck tube *	M12 or PG	12
GTL260 **GTL260M** **GTL280** **GTL280M**				• • • •				Ø 18 mm probe head Ø 18 mm probe head incl. transducer Ø 18 mm probe head Ø 18 mm probe head incl. transducer	M12 M12 PG PG	15
GTL241		•						Ø 59 mm probe head * Ø 59 mm probe head with neck tube *	M12 orPG	18
GTL261 **GTL261M** **GTL281** **GTL281M**		• • • •						Ø 18 mm probe head Ø 18 mm probe head incl. transducer Ø 18 mm probe head Ø 18 mm probe head incl. transducer	M12 M12 PG PG	21
GTL244			•					Ø 59 mm probe head *	M12 or PG	
GTL264 **GTL264M** **GTL284** **GTL284M**			• • • •					Ø 18 mm probe head Ø 18 mm probe head incl. transducer Ø 18 mm probe head Ø 18 mm probe head incl. transducer	M12 M12 PG PG	26
GTL 263 **GTL 263M**			• •					Ø 18 mm probe head Ø 18 mm probe head incl. transducer	M12 M12	28
GTL349					•			Ø 59 mm probe head *	M12 or PG	
GTL369 **GTL369M** **GTL389** **GTL389M**					• • • •			Ø 18 mm probe head Ø 18 mm probe head incl. transducer Ø 18 mm probe head Ø 18 mm probe head incl. transducer	M12 M12 PG PG	32
GTL459						•		Ø 59 mm probe head *	M12 or PG	
GTL479 **GTL479M** **GTL499** **GTL499M**						• • • •		Ø 18 mm probe head Ø 18 mm probe head incl. transducer Ø 18 mm probe head Ø 18 mm probe head incl. transducer	M12 M12 PG PG	37
Doubles-Pt100 Ø59	•	•		•	•	•		Ø 59 mm probe head * Ø 59 mm probe head with neck tube *	M12 orPG	62
Doubles-Pt100 Ø18	•	•		•	•	•		Ø 18 mm probe head Ø 18 mm probe head incl. transducer	M12 or PG	65
GTL720 **GTL723**							• •	Ø 18 mm probe head Ø 18 mm probe head incl. transducer	M12 M12	46
GTL737							•	Ø 59 probe head incl. transducer	M12	49

Errors and misprints excepted. Subject to technical modifications.

Geräteübersicht

Type	Process connection							Design	Electric connection	Page
	M12	G ½	G ½ flush mounted	G ½ standard	without thread	G ⅜ union nut	Clamp-on			
Temperature probes (*optionally with transducer / integrated on-site display)										
HTK12-I/U/F	•							M 12 mm – housing	M12	52
HTK12-S	•							M 12 mm – housing	M12	54
HTK30	•							Ø 30 mm probe head	M12	57
HTK35	•							Ø 45 mm probe head , with integrated on-site display	M12	60
Accessories	• GTL - Configuration tool • GKEV-25/76 • GEMK-25/76 • APHG12 • APHK25 • APHZ18 • APHZ30-G12S • APHK35-G12S • WLP10S • ECI-1 • KH-PV							Device configurator for GTL Compression fitting for GTL Compression fitting for GTL Adapter sleeve Weld-in sleeve Weld-in sleeve Weld-in sleeve for G ½ standard Weld-in sleeve for G ½ standard Heat transfer paste Device configurator for HTK Screened cables for HTK		85

- For further accessories see product information “GHMadapt / Accessories” in register: Process measuring technology in “Hygienic Design”
Errors and misprints excepted. Subject to technical modifications.

Overview head transducer

	Head transducer RT 420	GTML1
Measuring input	PT100	PT100
Sensor connection	2-, 3- or 4-wire circuit	2-, 3-, or 4-wire circuit
Measuring range	-200..-825 °C, programmable	-40..+200 °C, programmable
Electrical connection	screw terminals	terminals with cable connection
Output signal	4..20.mA, 2-wire technology	4..20 mA, 2-wire technology
Supply voltage U_B	8..35 V DC	10..30 V DC
Perm burden R_A	$R_A \leq (U_B - 8\ V) / 0{,}023\ A$ (RA in Ohm)	$R_A \leq (U_B - 10\ V) / 0{,}023\ A$
Working temperature	-40..+85 °C	-40..+70 °C
Display	none	with or without LCD display
Protection class	housing IP40, terminals IP10	-
Installation in RG59	exchangeable	not exchangeable
Miscellaneous	programmable via programming tool for RT420	programmable via GTL - Configurations tool or via buttons (only with on-site display)

Temperature sensor GTL 142

GTL 142
standard

GTL 142 with
spacer

- **Hygienic M12 process connection**
- **Hygienic design and easy-to-sterilize measuring point**
- **Sensor completely made of stainless steel**

Characteristic

The temperature sensor GTL 142 is designed for temperature measurements in pipes or thin-walled tanks.

They can be used for example for process monitoring at tube curvatures, temperature measurements in pressure pipes or at measurements of pasty media in pipes.

The probes can be provided with different electric connections and with or without integrated head transmitter. The probes of design type “with neck tube” are applicable at permanent ambient temperatures up to 200 °C.

Specifications

Temperature ranges	: ambient:	-40..+80 °C
	process:	-40..+200 °C
	CIP- / SIP-temperature:	140 °C < 30 min.
Measuring resistor	: Pt100	
Accuracy	: class A, class AA	
Electrical connection	: cable gland M16x1.5 M12 plug (1.4305)	
Process connection	: hygienic M12	
Tightening torque	: 5..10 Nm	
Insertion length	: 50, 100, 150, 250 mm	
Sensor head	: Ø 59 mm	
Spacer	: length 100 mm	
Thermowell and senor tip:		
Ø 6 mm, Ø 4 mm	thermowell without taper	
Ø 3 mm	thermowell Ø 6 mm and sensor tip Ø 3 mm	
Response time	: tip Ø 3 mm: T_{90} ≤ 1.5 s tip Ø 4 mm: T_{90} ≤ 3.6 s tip Ø 6 mm: T_{90} ≤ 7.4 s	
Operating pressure	: max. 10 bar	
Material		
Sensor head	: 1.4305	
Spacer	: 1.4305	
Thermowell and sensor tip	: 1.4404	
Protection class	: IP67 / IP69K	
CE conformity	: EN 61326-1:2013 / -2-3:2013	

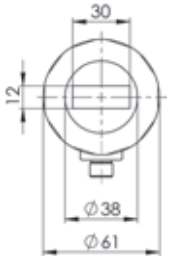
Transducer GTML1

Measuring range	: -10..+40 °C * / 0..50 °C * / 0..100 °C * 0..150 °C * / 0..200 °C * or freely in range -20..200 °C **
Power supply	: 10..30 V DC
Output	: analog, 4..20 mA, 2-wire
Output signal in case of error	: **< 3.75 mA** or > 21.5 mA, selectable *
Filter	: integrated low-pass, 4-step *
Response time	: < 150 ms (filter 0), **< 300 ms (filter 1)** < 800 ms (filter 2), < 3 s (filter 3)
Ambient temperature	: -40..+70 °C
Accuracy	: < 0.2 % FS
Temperature drift	: < 0.01 % FS / K

Transducer GTML1 with on-site display

Transducer with integrated **on-site display (LCD)** only in combination with electric connection: cable connection M12 plug and integrated transducer (for further information see transducer GTML1).

Display	: 4-digit LCD
Displayed unit	: **°C** or °F, selectable *
Resolution	: **0.1 °C** or 1 °C, selectable *
Background illumination	: **activatable**, deactivatable *
Ambient temperature	: -20..+60 °C



* Programmable via GTL - Configuration tool (accessories) or buttons (only with on-site display)

** Programmable via GTL - Configuration tool (accessories)

Note: The default settings are marked in **bold**.

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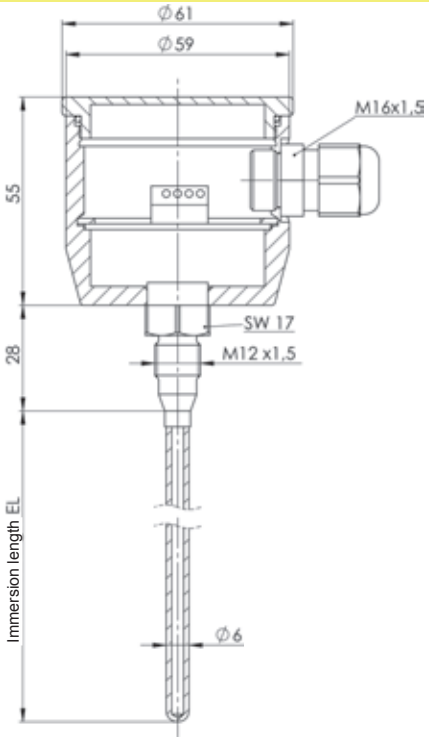
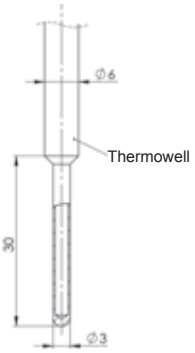
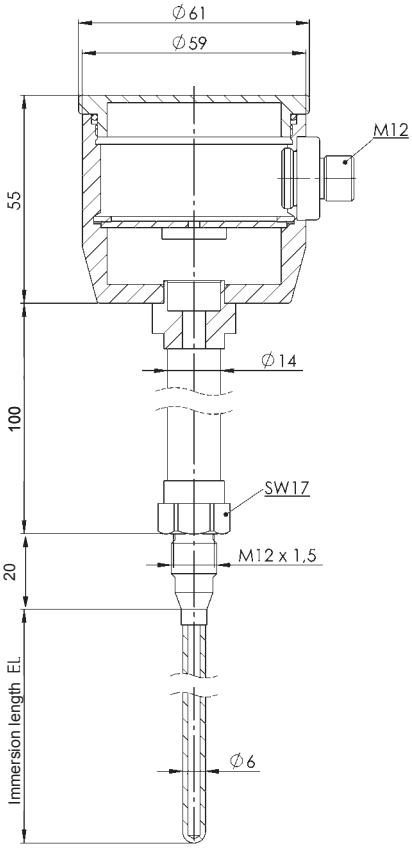
Dimensions

GTL 142





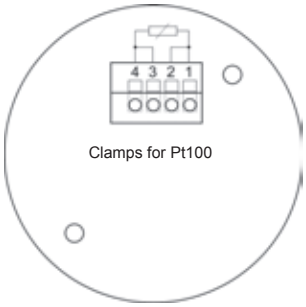
GTL 142 with spacer



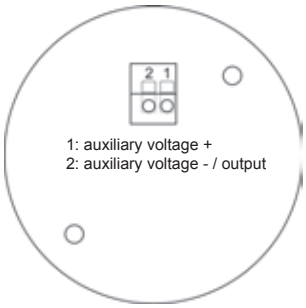
Connection

Electrical connection: cable gland M16x1.5 (PG)

without transducer (4-wire):

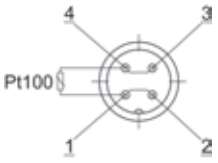


with transducer (2-wire):

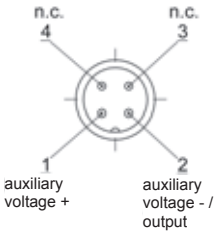


Electrical connection: M12-plug (1.4305)

without transducer (4-wire):



with transducer (2-wire):



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Product key

	1.	2.	3.	4.	5.	6.	7.	8.	9.
GTL		-		-		-		-		-		-		-	

1.	**Design type**	
	142	with hygienic M12 process connection
2.	**Electric connection**	
	P	cable gland M16x1.5
	V	V2A cable gland M16x1.5
	M	M12-plug
3.	**Immersion length EL**	
	0020	20 mm
	0050	50 mm
	0100	100 mm
	0150	150 mm
	0250	250 mm
	xxxx	any EL in mm (surcharge from 250 mm for each 100 mm started, up to max. immersion length: Ø 6: max. 1000 mm; Ø 4: max. 500 mm)
4.	**Diameter thermowell and sensor tip**	
	6	Ø 6 mm, without taper
	4	Ø 4 mm, without taper
	3	Ø 6 mm, with tapered probe tip Ø 3 mm
5.	**Accuracy class**	
	A	class A
	D	class AA (1/3 class B)
6.	**Transducer**	
	0	without transducer
	M	permanently integrated transducer GTML1, without display
	V	permanently integrated transducer GTML1, on-site display (LCD)
	R	exchangeable head transducer RT420
	T	exchangeable head transducer T19
7.	**Measuring range**	
	0	without transducer
	1	measuring range -10..+40 °C (-50..+50 °C for head transducer T19)
	2	measuring range 0..50 °C
	3	measuring range 0..100 °C
	4	measuring range 0..150 °C
	5	measuring range 0..200 °C
	B	transducer with special measuring range in °C (not possible for head transducer T19), state special measuring range separately e.g.: 0..75 °C or -20..+30 °C; Mind the minimum range of 50 °C.
8.	**Option**	
	00	without option
	H	with spacer
9.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	WZ2.2	factory certification 2.2
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)
	APZ2P	acceptance test certificate 3.1 with 2 measuring points (0°C / 70°C)
	APZ3P	acceptance test certificate 3.1 with 3 measuring points (0°C, 70°C + 1 test point freely selectable)
	APZ4P	acceptance test certificate 3.1 with 4 measuring points (0°C, 70°C + 2 test points freely selectable)

Notes on on-site display (LCD):
Permanently integrated transducer GTML1 (programmable) with on-site display only in combination with electrical connection: cable connection M12 plug.

Information on suitable weld-in sleeves can be found in product information GHM*adapt*/Accessories.

Temperature sensor GTL 162 / 162M GTL 182 / 182M

- **Hygienic M12 process connection**
- **Hygienic design and easy-to-sterilize measuring point**
- **Sensor completely made of stainless steel**

Characteristic

The temperature sensors are designed for temperature measurements in pipes or thin-walled tanks.

They can be used for example for process monitoring at tube curvatures, temperature measurements in pressure pipes or at measurements of pasty media in pipes.

The sensors can be provided with different electric connections and with or without integrated head transmitter.

Specifications

Temperature ranges	: ambiance:	-40..+80 °C
	probe tip:	-40..+200 °C
	CIP- / SIP-temperature:	140 °C < 30 min.
Measuring resistor	: Pt100	
Accuracy	: class A, class AA	
Process connection	: hygienic M12	
Tightening torque	: 5..10 Nm	
Insertion length	: 50, 100, 150 or 250 mm	
Sensor head	: Ø 18 mm	
Thermowell and sensor tip:		
Ø 6 mm, Ø 4 mm	Thermowell without taper	
Ø 3 mm	Thermowell Ø 6 mm and sensor tip Ø 3 mm	
Response time	: tip Ø 3 mm: T_{90} ≤ 1.5 s	
	tip Ø 4 mm: T_{90} ≤ 3.6 s	
	tip Ø 6 mm: T_{90} ≤ 7.4 s	
Operating pressure	: max. 10 bar	
Material		
Sensor head	: 1.4305 (V2A)	
Thermowell and sensor tip	: 1.4404 (V4A)	
Protection class	: IP67 / IP69K	
CE conformity	: EN 61326-1:2013 / -2-3:2013	

Design type

	GTL 162 / 162M	GTL 182 / 182M
Electrical connection	M12-plug, 4-pin (1.4305)	fixed cable 2.5 m, PVC LIYY 182: 4 x 0.25 mm² 182M: 2 x 0.25 mm²

Transducer GTML2 (only for GTL 162M / GTL 182M)

Measuring range	:	-10..+40 °C * / 0..50 °C * / 0..100 °C * 0..150 °C * / 0..200 °C * or freely in range -20..200 °C *
Power supply	:	10..30 V DC
Output	:	analog, 4..20 mA, 2-wire
Output signal in case of error	:	**< 3.75 mA** or > 21.5 mA, selectable *
Filter	:	integrated low-pass, 4-step *
Response time	:	< 150 ms (filter 0), **< 300 ms (filter 1)** < 800 ms (filter 2), < 3 s (filter 3)
Ambient temperature	:	-40..+70 °C
Accuracy	:	< 0.2 % FS
Temperature drift	:	< 0.01 % FS / K

* Programmable via GTL - Configuration tool (accessories)

Note: The default settings are marked in **bold**.

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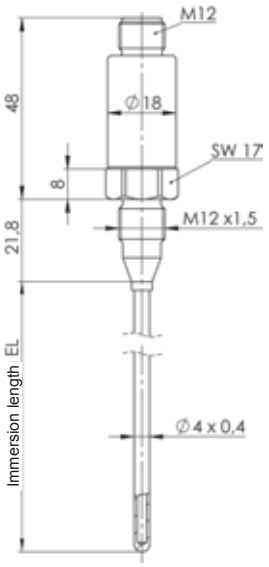
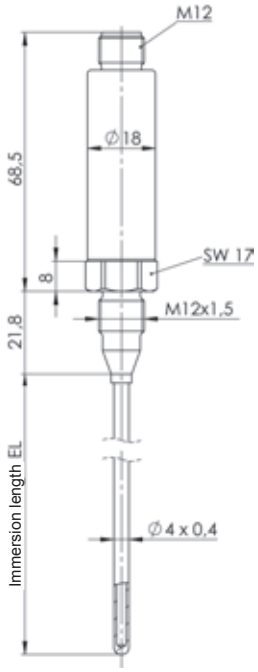
Dimensions

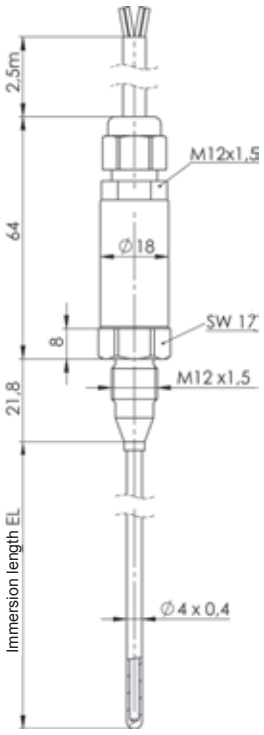
GTL 162



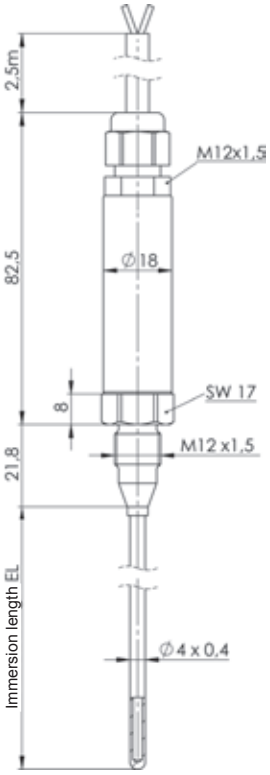
GTL 162M

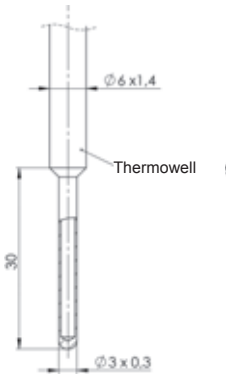


GTL 182



GTL 182M

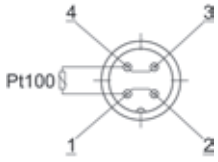




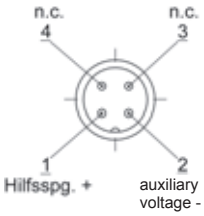
Connection

Design type GTL 162 or GTL 162M:

without transducer (4-wire):

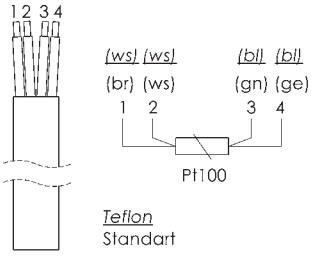


with transducer (2-wire):

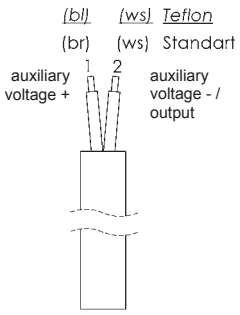


Design type GTL 182 or GTL 182M:

without transducer (4-wire):



with transducer (2-wire):



Options

TK	Design type GTL 182 and GTL 182M with **Teflon cable** GTL 182: 4 x 0.14 mm² GTL 182M: 2 x 0.14 mm² **Teflon cable up to 200 °C**

continued on next page

Product key

GTL 1. [ ] - 2. [ ] - 3. [ ] - 4. [ ] 5. [ ] 6. [ ] - 7. [ ]

1.	**Design type**	
	162	M12-plug, without integrated transducer
	162M	M12-plug, with integrated transducer
	182	fixed cable (PVC) connection 2.5m, without integrated transducer
	182M	fixed cable (PVC) connection 2.5m, with integrated transducer
2.	**Insertion length EL**	
	0020	20 mm
	0050	50 mm
	0100	100 mm
	0150	150 mm
	0250	250 mm
	xxxx	any EL in mm (surcharge from 250 mm for each 100 mm started, up to max. insertion length: Ø 6: max. 1000 mm Ø 4: max. 500 mm)
3.	**Diameter thermowell and sensor tip**	
	6	Ø 6 mm, without taper
	4	Ø 4 mm, without taper
	3	Ø 6 mm, with tapered sensor tip Ø 3 mm
4.	**Accuracy class**	
	A	class A
	D	class AA (1/3 class B)
5.	**Transducer GTML2 (programmable) ONLY for design types 162M and 182M**	
	00	without transducer (design types 162 / 182)
	M1	measuring range -10..+40 °C
	M2	measuring range 0..50 °C
	M3	measuring range 0..100 °C
	M4	measuring range 0..150 °C
	M5	measuring range 0..200 °C
	MB	transducer with special measuring range in °C (state special measuring range separately e.g.: 0..75 °C or -20..+30 °C) Mind the minimum range of 50 °C.
6.	**Option**	
	00	without option
	H	with neck tube
	TK	Teflon cable for connection via fixed cable (only available for GTL 182 / 182M)
7.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	WZ2.2	factory certification 2.2
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)
	APZ2P	acceptance test certificate 3.1 with 2 measuring points (0°C / 70°C)
	APZ3P	acceptance test certificate 3.1 with 3 measuring points (0°C, 70°C + 1 test point freely selectable)
	APZ4P	acceptance test certificate 3.1 with 4 measuring points (0°C, 70°C + 2 test points freely selectable)

Information on suitable weld-in sleeves can be found in product information GHM*adapt*/Accessories.

GREISINGER
Member of GHM GROUP

Temperature probe GTL 240

GTL 240
standard

GTL 240
with neck
tube

- **G ½" standard process connection hygienic**
- **Sensor completely made of stainless steel**

Characteristic

The temperature probes are designed for temperature monitoring in pipes and tanks, temperature measurements in steam and pressure pipes and for monitoring of CIP- / SIP- processes.

Suitable weld-in sleeves ensures disassembling of the temperature probe without process opening or interruption.

The probes can be provided with different electric connections and with or without integrated head transmitter.

Specifications

Temperature ranges	:	ambiance: -40..+80 °C probe tip: -40..+200 °C CIP- / SIP-temperature: 140 °C < 30 min.
Measuring resistor	:	Pt100
Accuracy	:	class A, class AA
Electric connection	:	G ½" standard suitable weld-in sleeves APHZ30-G12S, APHK35-G12S (see accessories)

Fitting length	:	50, 100, 150, 250 mm
Probe head	:	Ø 59 mm
Neck tube	:	length 100 mm
Protection tube and probe tip:		
Ø 6 mm		protection tube Ø 6 mm without taper
Ø 3 mm		protection tube Ø 6 mm and tapered probe tip Ø 3 mm
Response time	:	FS Ø 3 mm: T_{90} ≤ 1.5 s FS Ø 6 mm: T_{90} ≤ 7.4 s
Working pressure	:	max. 10 bar
Material		
Probe head	:	1.4305
Neck tube	:	1.4305
Protection tube and tip	:	1.4404
Protection class	:	IP67 / IP69K
CE conformity	:	EN 61326-1:2013 / -2-3:2013

Transducer GTML1

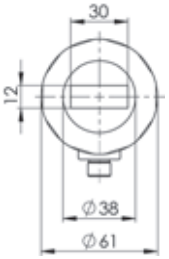
Integrated head transmitter

Measuring range	:	-10..+40 °C * / 0..50 °C * / 0..100 °C * 0..150 °C * / 0..200 °C * or freely in range -20..200 °C **
Power supply	:	10..30 V DC
Measuring output	:	analog, 4..20 mA, 2-wire
Output signal in case of error	:	**< 3.75 mA** or > 21.5 mA, selectable *
Filter	:	integrated low-pass, 4-step *
Reaction time	:	< 150 ms (filter 0), **< 300 ms (filter 1)** < 800 ms (filter 2), < 3 s (filter 3)
Working temperature	:	-40..+70 °C
Accuracy	:	< 0.2 % FS
Temperature drift	:	< 0.01 % FS / K

Transducer GTML1 with on-site display

Transducer with integrated **on-site display (LCD)** only in combination with electric connection: cable connection M12 plug and integrated transducer (for further information see transducer GTML1).

Display	:	4-digit LCD
Displayed unit	:	**°C** or °F, selectable *
Resolution	:	**0.1 °C** or 1 °C, selectable *
Background illumination	:	**activatable**, deactivatable *
Working temperature	:	-20..+60 °C

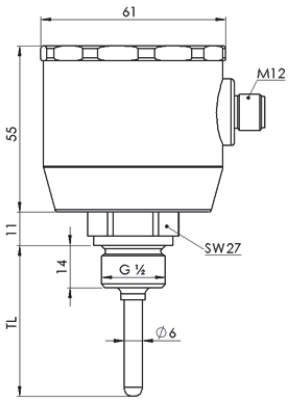


* Programmable via GTL - Configuration tool (accessories) or buttons (only with on-site display)
** Programmable via GTL - Configuration tool (accessories)

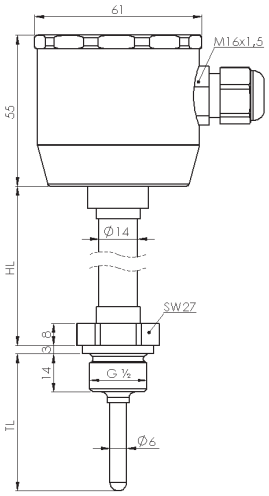
Note: The default settings are marked in **bold**.

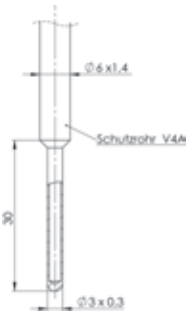
Dimensions

GTL 240
standard



GTL 240 with neck tube





Connection

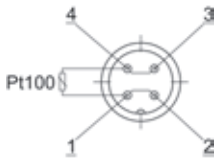
Electric connection: cable screwing M16x1.5 (PG)

without transducer (4-wire):

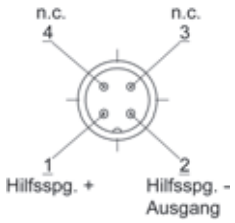
with transducer (2-wire):

Electric connection: cable connection M12-plug (1.4305)

without transducer (4-wire):



with transducer (2-wire):



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Product key

	1.	2.	3.	4.	5.	6.	7.	8.	9.
GTL		-		-		-		-		-		-		-	

1.	**Design type**	
	240	without neck tube
2.	**Electric connection**	
	P	cable screwing M16x1.5 (PG)
	V	V2A cable screwing M16x1.5 (PG)
	M	cable connection M12-plug
3.	**Immersion length TL**	
	0050	50 mm
	0100	100 mm
	0150	150 mm
	0250	250 mm
	xxxx	any EL in mm (e.g. 320 = 320 mm) Ø 6: max. 1000 mm
4.	**Diameter protection tube and probe tip**	
	6	Ø 6 mm, without taper
	3	Ø 6 mm, with tapered probe tip Ø 3 mm
5.	**Accuracy class**	
	A	class A
	D	class AA (1/3 class B)
6.	**Transducer**	
	0	without transducer
	M	permanently integrated transducer GTML1, without display
	V	permanently integrated transducer GTML1, on-site display (LCD)
	R	exchangeable head transducer RT420
	T	exchangeable head transducer T19
7.	**Measuring range**	
	0	without transducer
	1	measuring range -10..+40 °C (-50..+50 °C for head transducer T19)
	2	measuring range 0..50 °C
	3	measuring range 0..100 °C
	4	measuring range 0..150 °C
	5	measuring range 0..200 °C
	B	transducer with special measuring range in °C (not possible for head transducer T19), state special measuring range separately e.g.: 0..75 °C or -20..+30 °C Mind the minimum range of 50 °C.
8.	**Option**	
	00	without option
	H	with neck tube (100 mm)
9.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	WZ2.2	factory certification 2.2
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)
	APZ2P	acceptance test certificate 3.1 with 2 measuring points (0°C / 70°C)
	APZ3P	acceptance test certificate 3.1 with 3 measuring points (0°C, 70°C + 1 test point freely selectable)
	APZ4P	acceptance test certificate 3.1 with 4 measuring points (0°C, 70°C + 2 test points freely selectable)

Notes on on-site display (LCD):
Permanently integrated transducer GTML1 (programmable) with on-site display only in combination with electric connection: cable connection M12 plug.

Information on suitable weld-in sleeves can be found in product information GHM*adapt*/Accessories.

Temperature probe
GTL 260 / 260M
GTL 280 / 280M

- **G ½" standard process connection hygienic**
- **Sensor completely made of stainless steel**

Characteristic

The temperature probes are designed for temperature monitoring in pipes and tanks, temperature measurements in steam and pressure pipes and for monitoring of CIP- / SIP- processes.

Suitable weld-in sleeves ensures disassembling of the temperature probe without process opening or interruption.

The probes can be provided with different electric connections and with or without integrated head transmitter.

Specifications

Temperature ranges	: ambiance:	-40..+80 °C
	probe tip:	-40..+200 °C
	CIP- / SIP-temperature:	140 °C < 30 min.
Measuring resistor	: Pt100	
Accuracy	: class A, class AA	
Electric connection	: G ½" standard hygienic suitable weld-in sleeves APHZ30-G12S, APHK35-G12S (see accessories)	

Fitting length	: 50, 100, 150, 250 mm
Probe head	: Ø 18 mm
Protection tube and probe tip:	
Ø 6 mm	protection tube Ø 6 mm without taper
Ø 3 mm	protection tube Ø 6 mm and tapered probe tip Ø 3 mm
Response time	: FS Ø 3 mm: T_{90} ≤ 1.5 s FS Ø 6 mm: T_{90} ≤ 7.4 s
Working pressure	: max. 10 bar
Material	
Probe head	: 1.4305
Protection tube and tip	: 1.4404
Protection class	: IP67 / IP69K
CE conformity	: EN 61326-1:2013 / -2-3:2013

Design types

	GTL 260 / 260M	GTL 280 / 280M
Electric connection	cable connection M12-plug, 4-pin (1.4305)	fixed cable 2.5 m, PVC LIYY 281: 4 x 0.25 mm² 281M: 2 x 0.25 mm²

Transducer GTML2 (only for GTL 260M / GTL 280M)

Integrated head transmitter

Measuring range	: -10..+40 °C * / 0..50 °C * / 0..100 °C * 0..150 °C * / 0..200 °C * or freely in range -20..200 °C *
Power supply	: 10..30 V DC
Measuring output	: analog, 4..20 mA, 2-wire
Output signal in case of error	: **< 3.75 mA** or > 21.5 mA, selectable *
Filter	: integrated low-pass, 4-step *
Reaction time	: < 150 ms (filter 0), **< 300 ms (filter 1)** < 800 ms (filter 2), < 3 s (filter 3)
Working temperature	: -40..+70 °C
Measurement accuracy	: < 0.2 % FS
Temperature drift	: < 0.01 % FS / K

* Programmable via GTL - Configuration tool (accessories)

Note: The default settings are marked in **bold**.

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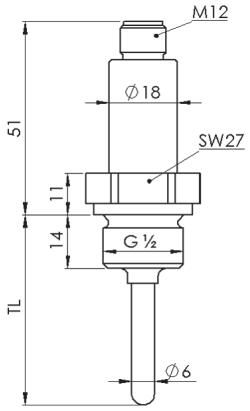
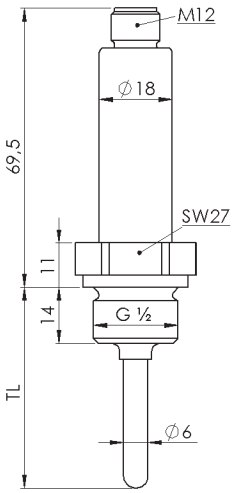
Dimensions

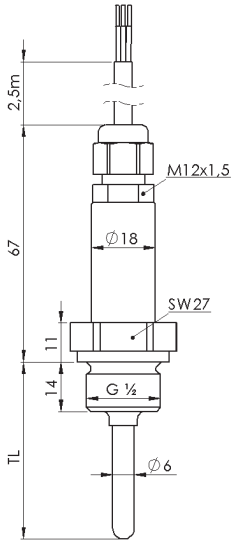
GTL 260



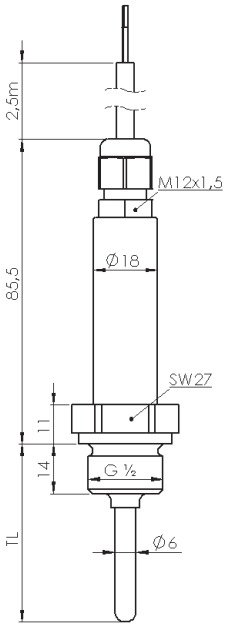
GTL 260M

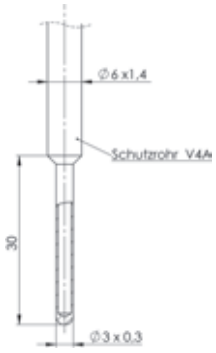


GTL 280



GTL 280M

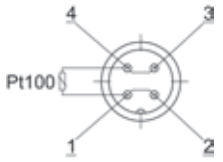




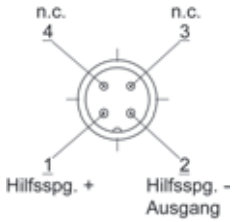
Connection

Design type GTL 260 or GTL 260M:

without transducer (4-wire):

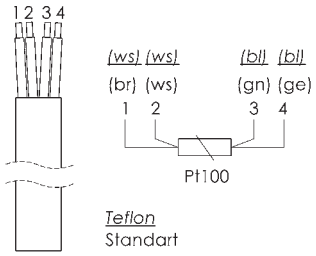


with transducer (2-wire):

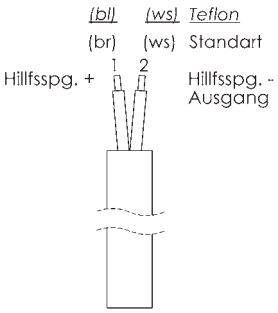


Design type GTL 280 or GTL 280M:

without transducer (4-wire):



with transducer (2-wire):



Option

TK	Design type GTL 280 and GTL 280M with **Teflon cable** GTL 280: 4 x 0.14 mm² GTL 280M: 2 x 0.14 mm² Teflon cable up to 200 °C

continued on next page

Product key

	1.		2.		3.		4.		5.		6.		7.
GTL		-		-								-	

1.	**Design type**	
	260	cable connection M12-plug, without integrated transducer
	260M	cable connection M12-plug with integrated transducer
	280	fixed cable (PVC) connection 2.5m, without integrated transducer
	280M	fixed cable (PVC) connection 2.5m, with integrated transducer
2.	**Immersion length TL**	
	0050	50 mm
	0100	100 mm
	0150	150 mm
	0250	250 mm
	xxxx	any EL in mm (e.g. 320 = 320 mm) Ø 6: max. 1000 mm
3.	**Diameter protection tube and probe tip**	
	6	Ø 6 mm, without taper
	3	Ø 6 mm, with tapered probe tip Ø 3 mm
4.	**Accuracy class**	
	A	class A
	D	class AA (1/3 class B)
5.	**Transducer GTML2 (programmable) ONLY for design types 260M and 280M**	
	00	without transducer (design types 260 / 280)
	M1	measuring range -10..+40 °C
	M2	measuring range 0..50 °C
	M3	measuring range 0..100 °C
	M4	measuring range 0..150 °C
	M5	measuring range 0..200 °C
	MB	transducer with special measuring range in °C (state special measuring range separately e.g.: 0..75 °C or -20..+30 °C Mind the minimum range of 50 °C.)
6.	**Option**	
	00	without option
	H	with neck tube
	TK	Teflon cable for connection via fixed cable (only available for GTL 280 / 280M)
7.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	WZ2.2	factory certification 2.2
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)
	APZ2P	acceptance test certificate 3.1 with 2 measuring points (0°C / 70°C)
	APZ3P	acceptance test certificate 3.1 with 3 measuring points (0°C, 70°C + 1 test point freely selectable)
	APZ4P	acceptance test certificate 3.1 with 4 measuring points (0°C, 70°C + 2 test points freely selectable)

Information on suitable weld-in sleeves can be found in product information GHM*adapt*/Accessories.

Temperature probe GTL 241

GTL 241
standard

GTL 241
with neck
tube

- **G ½" standard process connection hygienic**
- **Hygienic design and easy-to-sterilize measuring point**
- **Sensor completely made of stainless steel**

Characteristic

The temperature probes GTL 241 and GTL 251 are designed for temperature measurements in pipes or tanks.

They can be used for example for monitoring the CIP / SIP procedures or temperature measurements in milk tanks.

The probes can be provided with different electric connections and with or without integrated head transmitter. The probes of design type "with neck tube" are applicable at permanent ambient temperatures up to 200 °C.

Specifications

Temperature ranges	:	ambiance: -40..+80 °C probe tip: -40..+200 °C CIP- / SIP-temperature: 140 °C < 30 min.
Measuring resistor	:	Pt100
Accuracy	:	class A, class AA
Electric connection	:	cable screwing M16x1.5 (PG) cable connection M12- plug (1.4305)
Process connection	:	G ½
Clamping torque	:	5..20 Nm
Fitting length	:	50, 100, 150, 250 mm
Probe head	:	Ø 59 mm
Neck tube	:	length 100 mm
Protection tube and probe tip:		
Ø 6 mm		protection tube Ø 6 mm without taper
Ø 3 mm		protection tube Ø 6 mm and tapered probe tip Ø 3 mm
Response time	:	FS Ø 3 mm: T_{90} ≤ 1.5 s FS Ø 6 mm: T_{90} ≤ 7.4 s
Working pressure	:	max. 10 bar
Material		
Probe head	:	1.4305
Neck tube	:	1.4305
Protection tube and tip	:	1.4404
Protection class	:	IP67 / IP69K
CE conformity	:	EN 61326-1:2013 / -2-3:2013

Transducer GTML1

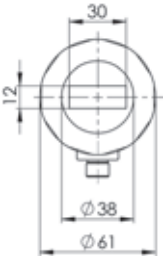
Integrated head transmitter

Measuring range	:	-10..+40 °C * / 0..50 °C * / 0..100 °C * 0..150 °C * / 0..200 °C * or freely in range -20..200 °C **
Power supply	:	10..30 V DC
Measuring output	:	analog, 4..20 mA, 2-wire
Output signal in case of error	:	**< 3.75 mA** or > 21.5 mA, selectable *
Filter	:	integrated low-pass, 4-step *
Reaction time	:	< 150 ms (filter 0), **< 300 ms (filter 1)** < 800 ms (filter 2), < 3 s (filter 3)
Working temperature	:	-40..+70 °C
Accuracy	:	< 0.2 % FS
Temperature drift	:	< 0.01 % FS / K

Transducer GTML1 with on-site display

Transducer with integrated **on-site display (LCD)** only in combination with electric connection: cable connection M12 plug and integrated transducer (for further information see transducer GTML1).

Display	:	4-digit LCD
Displayed unit	:	**°C** or °F, selectable *
Resolution	:	**0.1 °C** or 1 °C, selectable *
Background illumination	:	**activatable**, deactivatable *
Working temperature	:	-20..+60 °C



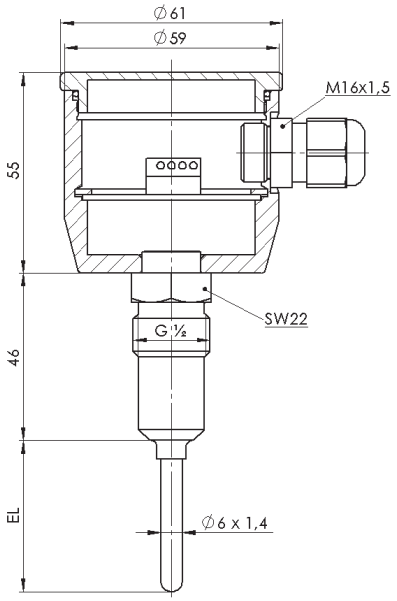
* Programmable via GTL - Configuration tool (accessories) or buttons (only with on-site display)

** Programmable via GTL - Configuration tool (accessories)

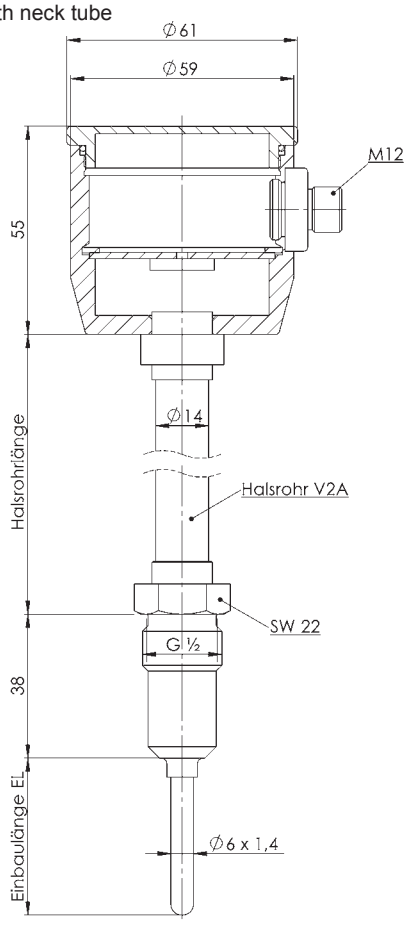
Note: The default settings are marked in **bold**.

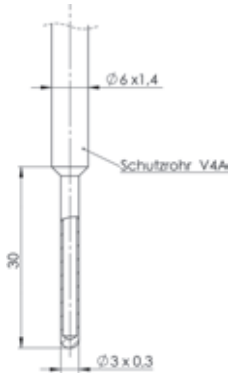
Dimensions

GTL 24‘
standard



GTL 241 with neck tube





Connection

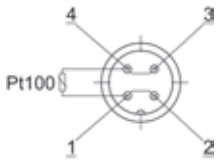
Electric connection: cable screwing M16x1.5 (PG)

without transducer (4-wire):

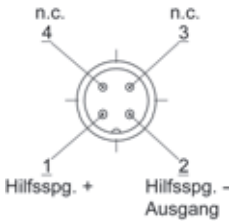
with transducer (2-wire):

Electric connection: cable connection M12-plug (1.4305)

without transducer (4-wire):



with transducer (2-wire):



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Product key

GTL 1. [ ] - 2. [ ] - 3. [ ] - 4. [ ] - 5. [ ] - 6. [ ] - 7. [ ] - 8. [ ] - 9. [ ]

1.	**Design type**	
	241	without neck tube
2.	**Electric connection**	
	P	cable screwing M16x1.5 (PG)
	V	V2A cable screwing M16x1.5 (PG)
	M	cable connection M12-plug
3.	**Fitting length EL**	
	0050	50 mm
	0100	100 mm
	0150	150 mm
	0250	250 mm
	xxxx	any EL in mm (surcharge from 250 mm for each 100 mm started, up to max. fitting length: Ø 6: max. 1000 mm)
4.	**Diameter protection tube and probe tip**	
	6	Ø 6 mm, without taper
	3	Ø 6 mm, with tapered probe tip Ø 3 mm
5.	**Accuracy class**	
	A	class A
	D	class AA (1/3 class B)
6.	**Transducer**	
	0	without transducer
	M	permanently integrated transducer GTML1, without display
	V	permanently integrated transducer GTML1, on-site display (LCD)
	R	exchangeable head transducer RT420
	T	exchangeable head transducer T19
7.	**Measuring range**	
	0	without transducer
	1	measuring range -10..+40 °C (-50..+50 °C for head transducer T19)
	2	measuring range 0..50 °C
	3	measuring range 0..100 °C
	4	measuring range 0..150 °C
	5	measuring range 0..200 °C
	B	transducer with special measuring range in °C (not possible for head transducer T19), state special measuring range separately e.g.: 0..75 °C or -20..+30 °C Mind the minimum range of 50 °C.
8.	**Option**	
	00	without Option
	H	with neck tube
9.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	WZ2.2	factory certification 2.2
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)
	APZ2P	acceptance test certificate 3.1 with 2 measuring points (0°C / 70°C)
	APZ3P	acceptance test certificate 3.1 with 3 measuring points (0°C, 70°C + 1 test point freely selectable)
	APZ4P	acceptance test certificate 3.1 with 4 measuring points (0°C, 70°C + 2 test points freely selectable)

Notes on on-site display (LCD):
Permanently integrated transducer GTML1 (programmable) with on-site display only in combination with electric connection: cable connection M12 plug.

Information on suitable weld-in sleeves can be found in product information GHM*adapt*/Accessories.

Temperature probe GTL 261 / 261M GTL 281 / 281M

GTL 261 GTL 261M GTL 281 GTL 281M

- **G ½" process connection hygienic**
- **Hygienic design and easy-to-sterilize measuring point**
- **Sensor completely made of stainless steel**

Characteristic

The temperature probes are designed for temperature measurements in pipes or tanks.

They can be used for example for monitoring the CIP / SIP procedures or temperature measurements in milk tanks.

The probes can be provided with different electric connections and with or without integrated head transmitter.

Specifications

Temperature ranges	:	ambiance:	-40..+80 °C
		probe tip:	-40..+200 °C
		CIP- / SIP-temperature:	140 °C < 30 min.
Measuring resistor	:	Pt100	
Accuracy	:	class A, class AA	
Electric connection	:	G ½"	
Clamping torque	:	5..20 Nm	
Fitting length	:	50, 100, 150, 250 mm	
Probe head	:	Ø 18 mm	
Protection tube and probe tip:			
Ø 6 mm		protection tube Ø 6 mm without taper	
Ø 3 mm		protection tube Ø 6 mm and tapered probe tip Ø 3 mm	
Response time	:	FS Ø 3 mm: T_{90} ≤ 1.5 s	
		FS Ø 6 mm: T_{90} ≤ 7.4 s	
Working pressure	:	max. 10 bar	
Material			
Probe head	:	1.4305	
Protection tube and tip	:	1.4404	
Protection class	:	IP67 / IP69K	
CE conformity	:	EN 61326-1:2013 / -2-3:2013	

Design types

	GTL 261 / 261M	GTL 281 / 281M
Electric connection	cable connection M12-plug, 4-pin (1.4305)	fixed cable 2.5 m, PVC LIYY 281: 4 x 0.25 mm² 281M: 2 x 0.25 mm²

Transducer GTML2 (only for GTL 261M / GTL 281M)

Integrated head transmitter

Measuring range	:	-10..+40 °C * / 0..50 °C * / 0..100 °C * 0..150 °C * / 0..200 °C * or freely in range -20..200 °C *
Power supply	:	10..30 V DC
Measuring output	:	analog, 4..20 mA, 2-wire
Output signal in case of error	:	**< 3.75 mA** or > 21.5 mA, selectable *
Filter	:	integrated low-pass, 4-step *
Reaction time	:	< 150 ms (filter 0), **< 300 ms (filter 1)** < 800 ms (filter 2), < 3 s (filter 3)
Working temperature	:	-40..+70 °C
Measurement accuracy	:	< 0.2 % FS
Temperature drift	:	< 0.01 % FS / K

* Programmable via GTL - Configuration tool (accessories)

Note: The default settings are marked in **bold.**

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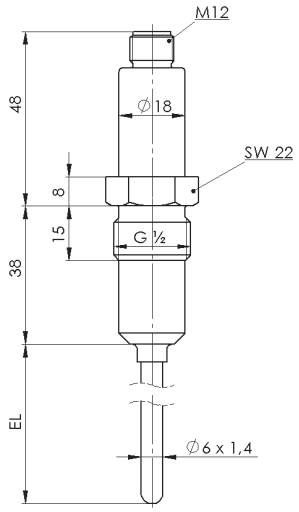
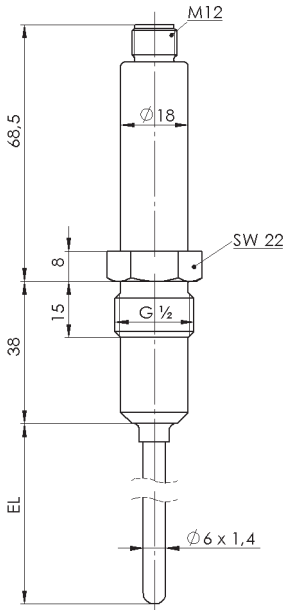
Dimensions

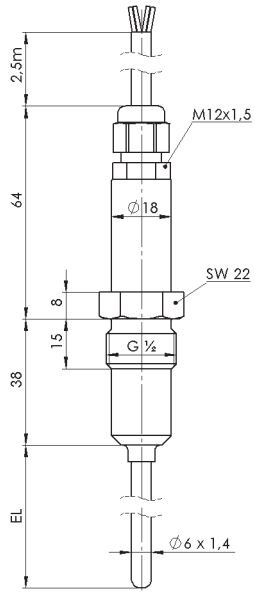
GTL 261



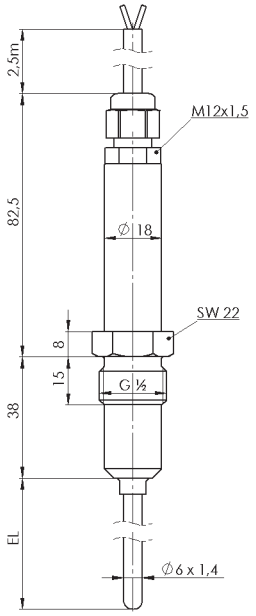
GTL 261M

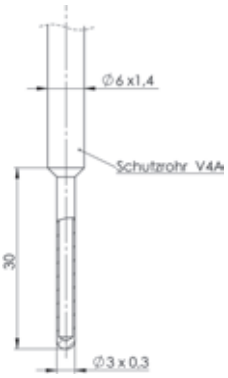


GTL 281



GTL 281M

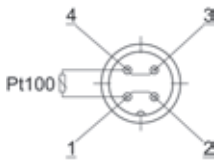




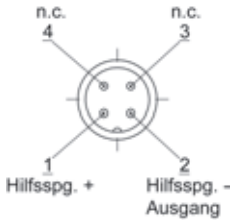
Connection

Design type GTL 261 or GTL 261M:

without transducer (4-wire):

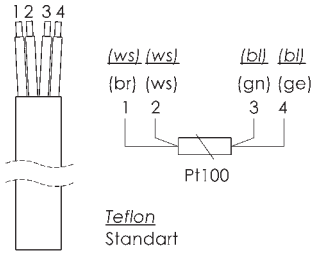


with transducer (2-wire):

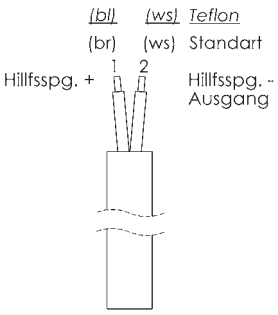


Design type GTL 281 or GTL 281M:

without transducer (4-wire):



with transducer (2-wire):



Option

TK	Design type GTL 281 and GTL 281M with **Teflon cable** GTL 280: 4 x 0.14 mm² GTL 280M: 2 x 0.14 mm² Teflon cable up to 200 °C

Product key

	1.		2.		3.		4.		5.		6.		7.
GTL		-		-		-		-				-	

1.	**Design type**	
	261	cable connection M12-plug, without integrated transducer
	261M	cable connection M12-plug with integrated transducer
	281	fixed cable (PVC) connection 2.5m, without integrated transducer
	281M	fixed cable (PVC) connection 2.5m, with integrated transducer
2.	**Fitting length EL**	
	0050	50 mm
	0100	100 mm
	0150	150 mm
	0250	250 mm
	xxxx	any EL in mm (surcharge from 250 mm for each 100 mm started, up to max. fitting length: Ø 6: max. 1000 mm)
3.	**Diameter protection tube and probe tip**	
	6	Ø 6 mm, without taper
	3	Ø 6 mm, with tapered probe tip Ø 3 mm
4.	**Accuracy class**	
	A	class A
	D	class AA (1/3 class B)
5.	**Transducer GTML2 (programmable) ONLY for design types 261M and 281M**	
	00	without transducer (design types 261 / 281)
	M1	measuring range -10..+40 °C
	M2	measuring range 0..50 °C
	M3	measuring range 0..100 °C
	M4	measuring range 0..150 °C
	M5	measuring range 0..200 °C
	MB	transducer with special measuring range in °C (state special measuring range separately e.g.: 0..75 °C or -20..+30 °C Mind the minimum range of 50 °C.)
6.	**Option**	
	00	without option
	H	with neck tube (100 mm)
	TK	Teflon cable for connection via fixed cable (only available for GTL 281 / 281M)
7.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	WZ2.2	factory certification 2.2
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)
	APZ2P	acceptance test certificate 3.1 with 2 measuring points (0°C / 70°C)
	APZ3P	acceptance test certificate 3.1 with 3 measuring points (0°C, 70°C + 1 test point freely selectable)
	APZ4P	acceptance test certificate 3.1 with 4 measuring points (0°C, 70°C + 2 test points freely selectable)

Information on suitable weld-in sleeves can be found in product information GHM*adapt*/Accessories.

Temperature probe GTL 244

- **Hygienic design and easy-to-sterilize measuring point**
- **Sensor made of stainless steel and PEEK**
- **Thermally decoupled**

Characteristic

The flush mounted temperature probes are designed for e.g. temperature monitoring in CIP- / SIP- circuits and temperature measurements in tanks with stirrer or in milk tanks.

The probes can be provided with or without integrated head transmitter.

Specifications

Temperature ranges	: ambiance:	-40..+80 °C
	probe tip:	-40..+150 °C
	CIP- / SIP-temperature:	140 °C < 30 min.
Measuring resistor	: Pt100	
Accuracy	: class A, class AA	
Electric connection	: cable screwing M16x1.5 (PG)	
	cable connection M12- plug (1.4305)	
Process connection	: G ½" hygienic	
Clamping torque	: 5..10 Nm	
Probe head	: Ø 59 mm	
Probe tip	: Ø 10 mm	
Response time	: T_{90} ≤ 15 s	
Working pressure	: max. 10 bar	

Material

Probe head	: 1.4305
Tip	: 1.4404, PEEK
Protection class	: IP67 / IP69K
CE conformity	: EN 61326-1:2013 / -2-3:2013

Transducer GTML1

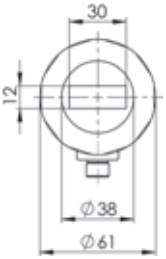
Integrated head transmitter

Measuring range	: -10..+40 °C * / 0..50 °C * / 0..100 °C * 0..150 °C * or freely in range -20..150 °C **
Power supply	: 10..30 V DC
Measuring output	: analog, 4..20 mA, 2-wire
Output signal in case of error	: **< 3.75 mA** or > 21.5 mA, selectable *
Filter	: integrated low-pass, 4-step *
Reaction time	: < 150 ms (filter 0), **< 300 ms (filter 1)** < 800 ms (filter 2), < 3 s (filter 3)
Working temperature	: -40..+70 °C
Accuracy	: < 0.2 % FS
Temperature drift	: < 0.01 % FS / K

Transducer GTML1 with on-site display

Transducer with integrated **on-site display (LCD)** only in combination with electric connection: cable connection M12 plug and integrated transducer (for further information see transducer GTML1).

Display	: 4-digit LCD
Displayed unit	: **°C** or °F, selectable *
Resolution	: **0.1 °C** or 1 °C, selectable *
Background illumination	: **activatable**, deactivatable *
Working temperature	: -20..+60 °C



* Programmable via GTL - Configuration tool (accessories) or buttons (only with on-site display)

** Programmable via GTL - Configuration tool (accessories)

Note: The default settings are marked in **bold**.

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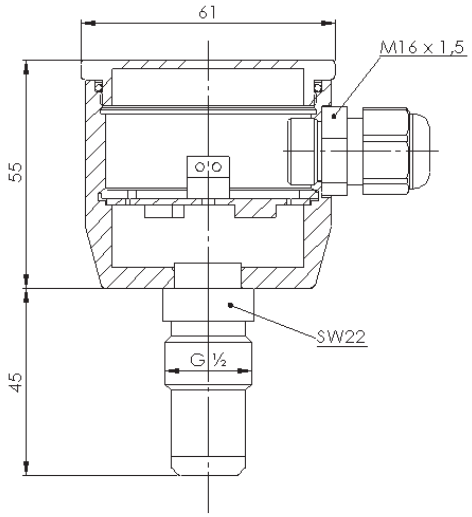
Dimensions



Connection

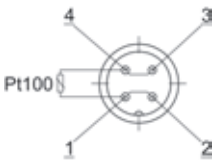
Electric connection: cable screwing M16x1.5 (PG)

without transducer (4-wire):

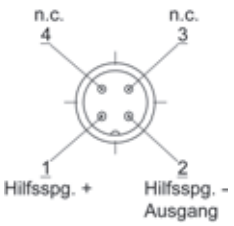
with transducer (2-wire):

Electric connection: cable connection M12-plug (1.4305)

without transducer (4-wire):



with transducer (2-wire):



Product key

GTL 1. - 2. - 3. - 4. - 5. - 6. - 7.

1.	**Design type**	
	244	G ½" flush mounted
2.	**Electric connection**	
	P	cable screwing M16x1.5 (PG)
	V	V2A cable screwing M16x1.5 (PG)
	M	cable connection M12-plug
3.	**Accuracy class**	
	A	class A
	D	class AA (1/3 class B)
4.	**Transducer**	
	0	without transducer
	M	permanently integrated transducer GTML1, without display
	V	permanently integrated transducer GTML1, on-site display (LCD)
	R	exchangeable head transducer RT420
	T	exchangeable head transducer T19
5.	**Measuring range**	
	0	without transducer
	1	measuring range -10..+40 °C (-50..+50 °C for head transducer T19)
	2	measuring range 0..50 °C
	3	measuring range 0..100 °C
	4	measuring range 0..150 °C
	B	transducer with special measuring range in °C (not possible for head transducer T19), state special measuring range separately e.g.: 0..75 °C or -20..+30 °C Mind the minimum range of 50 °C.
6.	**Option**	
	00	without option
	H	with neck tube
7.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	WZ2.2	factory certification 2.2
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)
	APZ2P	acceptance test certificate 3.1 with 2 measuring points (0°C / 70°C)
	APZ3P	acceptance test certificate 3.1 with 3 measuring points (0°C, 70°C + 1 test point freely selectable)
	APZ4P	acceptance test certificate 3.1 with 4 measuring points (0°C, 70°C + 2 test points freely selectable)

Notes on on-site display (LCD):
Permanently integrated transducer GTML1 (programmable) with on-site display only in combination with electric connection: cable connection M12 plug.

Information on suitable weld-in sleeves can be found in product information GHM*adapt*/Accessories.

Temperature sensor GTL 264 / 264M GTL 284 / 284M

GTL 264M GTL 284 GTL 284M

- **Hygienic G ½" process connection, flush mounted**
- **Hygienic design and easy-to-sterilize measuring point**
- **Sensor made of stainless steel and PEEK**
- **Thermally decoupled**

Characteristic

The flush mounted temperature sensors are designed for e.g. temperature monitoring in CIP- / SIP- circuits and temperature measurements in tanks with stirrer or in milk tanks.

The sensors can be provided with different electric connections and with or without integrated head transmitter.

Specifications

Temperature ranges	: ambiance:	-40..+80 °C
	sensor tip:	-40..+150 °C
	CIP- / SIP-temperature:	140 °C < 30 min.
Measuring resistor	: Pt100	
Accuracy	: class A, class AA	
Process connection	: G ½	
Tightening torque	: 5..10 Nm	
Sensor head	: Ø 18 mm	
Sensor tip	: Ø 10 mm	
Response time	: T_{90} ≤ 15 s	
Ambient pressure	: max. 10 bar	

Material

Sensor head	:	1.4305
Sensor tip	:	1.4404, PEEK
Protection class	:	IP67 / IP69K
CE conformity	:	EN 61326-1:2013 / -2-3:2013

Ausführungen

	GTL 264 / 264M	GTL 284 / 284M
Electrical connection	M12-plug, 4-pin (1.4305)	fixed cable 2.5 m, PVC LIYY 281: 4 x 0,25 mm² 281M: 2 x 0,25 mm²

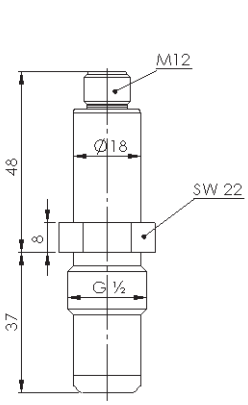
Transducer GTML2 (only for GTL 264M / GTL 284M)

Measuring range	:	-10..+40 °C * / 0..50 °C * / 0..100 °C * 0..150 °C * or freely in range -20..150 °C *
Power supply	:	10..30 V DC
Measuring output	:	analog, 4..20 mA, 2-wire
Output signal in case of error	:	**< 3.75 mA** or > 21.5 mA, selectable *
Filter	:	integrated low-pass, 4-step *
Response time	:	< 150 ms (filter 0), **< 300 ms (filter 1)** < 800 ms (filter 2), < 3 s (filter 3)
Working temperature	:	-40..+70 °C
Measurement accuracy	:	< 0.2 % FS
Temperature drift	:	< 0.01 % FS / K

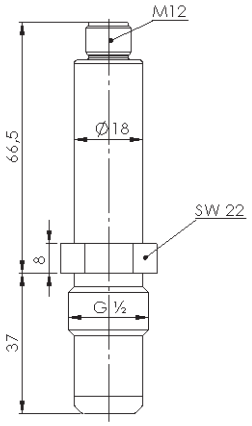
* Programmable via GTL - Configuration tool (accessories)

Note: The default settings are marked in **bold**.

Dimensions



GTL 264



GTL 264M

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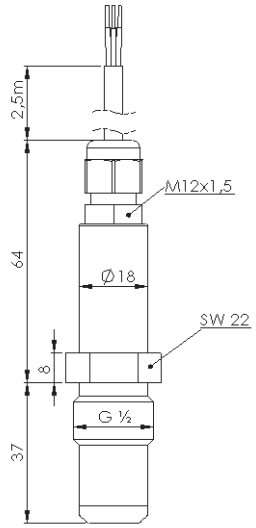
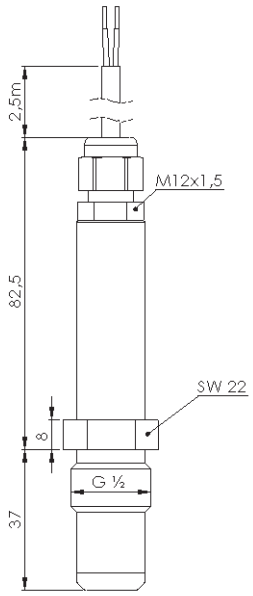


GTL 284

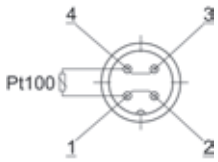


GTL 284M

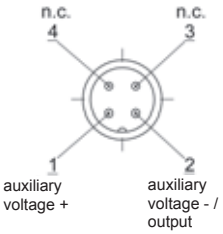
Connection

Design type GTL 264 or GTL 264M:

without transducer (4-wire):

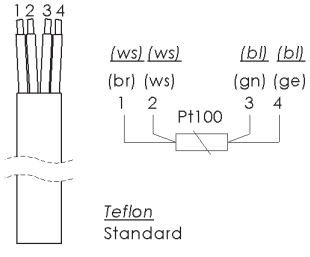


with transducer (2-wire):

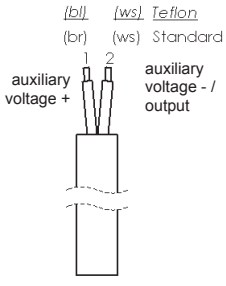


Design type GTL 284 or GTL 284M:

without transducer (4-wire):



with transducer (2-wire):



Option

TK	Design type GTL 284 and GTL 284M with **Teflon cable** GTL 284: 4 x 0.14 mm² GTL 284M: 2 x 0.14 mm² Teflon cable up to 200 °C

Product key

	1.		2.		3.		4.		5.
GTL		-		-		-		-	

1.	**Design type (electric connection)**	
	264	cable connection M12-plug
	264M	cable connection M12-plug with integrated transducer
	284	fixed cable (PVC) connection 2.5m, without integrated transducer
	284M	fixed cable (PVC) connection 2.5m, with integrated transducer
2.	**Accuracy class**	
	A	class A
	D	class AA (1/3 class B)
3.	**Transducer GTML2 (programmable)** **ONLY for design types 264M and 284M**	
	00	without transducer (design types 264 / 284)
	M1	measuring range -10..+40 °C
	M2	measuring range 0..50 °C
	M3	measuring range 0..100 °C
	M4	measuring range 0..150 °C
	MB	transducer with special measuring range in °C, max range: -20...+150 °C (state special measuring range separately e.g.: 0..75 °C or -20..+30 °C Mind the minimum range of 50 °C.)
4.	**Option**	
	00	without option
	H	with spacer (100 mm)
	TK	Teflon cable for connection via fixed cable (only available for GTL 284 / 284M)
5.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	WZ2.2	factory certification 2.2
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)
	APZ2P	acceptance test certificate 3.1 with 2 measuring points (0°C / 70°C)
	APZ3P	acceptance test certificate 3.1 with 3 measuring points (0°C, 70°C + 1 test point freely selectable)

Temperature probe GTL 263 / 263M

GTL 263M

- **G ½" process connection hygienic, flush mounted**
- **Sensor made of stainless steel and PEEK**
- **Thermally decoupled**

Characteristic

The flush mounted temperature probes with short sensor tip are designed for e.g. temperature measurements or monitoring in tanks with stirrer or for operation monitoring of pumps.

The probes can be provided with or without integrated head transmitter.

Specifications

Temperature ranges	: ambiance:	-40..+80 °C
	probe tip:	-40..+150 °C
	CIP- / SIP-temperature:	140 °C < 30 min.
Measuring resistor	: Pt100	
Accuracy	: class A, class AA	
Process connection	: G ½" hygienic	
Clamping torque	: 5..10 Nm	
Probe head	: Ø 18 mm	
Probe tip	: Ø 10 mm	
Response time	: T_{90} ≤ 15 s	
Working pressure	: max. 10 bar	
Material		
Probe head	: 1.4305	
Tip	: 1.4404, PEEK	
Protection class	: IP67 / IP69K	
CE conformity	: EN 61326-1:2013 / -2-3:2013	

Design types

	GTL 263 / 263M
Electric connection	cable connection M12-plug, 4-pin (1.4305)

Transducer GTML2 GTML2 (only for GTL 263M)

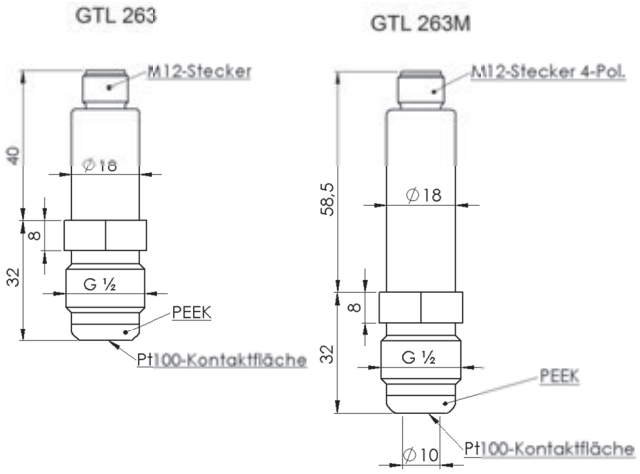
Integrated head transmitter

Measuring range	:	-10..+40 °C * / 0..50 °C * / 0..100 °C * 0..150 °C * or freely in range -20..150 °C *
Power supply	:	10..30 V DC
Measuring output	:	analog, 4..20 mA, 2-wire
Output signal in case of error	:	**< 3.75 mA** or > 21.5 mA, selectable *
Filter	:	integrated low-pass, 4-step *
Reaction time	:	< 150 ms (filter 0), **< 300 ms (filter 1)** < 800 ms (filter 2), < 3 s (filter 3)
Working temperature	:	-40..+70 °C
Measurement accuracy	:	< 0.2 % FS
Temperature drift	:	< 0.01 % FS / K

* Programmable via GTL - Configuration tool (accessories)

Note: The default settings are marked in **bold.**

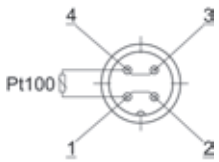
Dimensions



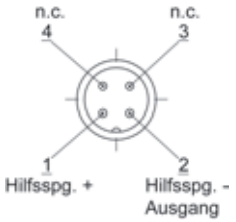
Connection

Design type GTL 263 or GTL 263M:

without transducer (4-wire):



with transducer (2-wire):



continued on next page

Product key

	1.	2.	3.	4.	5.
GTL		-	-		-

1.	**Design type (electric connection)**	
	263	cable connection M12-plug
	263M	cable connection M12-plug with integrated transducer
2.	**Accuracy class**	
	A	class A
	D	class AA (1/3 class B)
3.	**Transducer GTML2 (programmable) ONLY for design type 263M**	
	00	without transducer (design types 263)
	M1	measuring range -10..+40 °C
	M2	measuring range 0..50 °C
	M3	measuring range 0..100 °C
	M4	measuring range 0..150 °C
	MB	transducer with special measuring range in °C, max range: -20...+150 °C (state special measuring range separately e.g.: 0..75 °C or -20..+30 °C Mind the minimum range of 50 °C.)
4.	**Option**	
	00	without option
5.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	WZ2.2	factory certification 2.2
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)
	APZ2P	acceptance test certificate 3.1 with 2 measuring points (0°C / 70°C)
	APZ3P	acceptance test certificate 3.1 with 3 measuring points (0°C, 70°C + 1 test point freely selectable)
	APZ4P	acceptance test certificate 3.1 with 4 measuring points (0°C, 70°C + 2 test points freely selectable)

Temperature sensor GTL 349

- **Without tread**
- **Hygienic design and easy-to-sterilize measuring point**
- **Sensor completely made of stainless steel**

Characteristic

The temperature sensor GTL 349 is designed for temperature measurements in pipes of different nominal diameters or thin-walled tubes and tanks.

They can be used for example for process monitoring at tube curvatures, temperature measurements in pressure pipes or at measurements of pasty media in pipes

The fitting length can be varied by use of compression fitting. The probes can be provided with different electric connections and with or without integrated head transmitter.

Specifications

Temperature ranges	: ambiance	:	-40..+80 °C
	sensor tip	:	-40..+200 °C
	CIP- / SIP-temperature:		140 °C < 30 min.
Measuring resistor	: Pt100		
Accuracy	: class A, class AA		
Electrical connection	: cable gland M16x1.5 M12-plug (1.4305)		

Process connection	:	no thread suitable weld-in sleeves e.g.: GKEV-25/76, GEMK-25/76 (see accessories page 63)

Insertion length	:	50, 100, 150, 250 mm
Sensor head	:	Ø 59 mm
Thermowell and sensor tip:		
Ø 6 mm		thermowell Ø 6 mm without taper
Ø 3 mm		thermowell Ø 6 mm and sensor tip Ø 3 mm
Response time	:	tip Ø 3 mm: T_{90} ≤ 1.5 s tip Ø 6 mm: T_{90} ≤ 7.4 s
Operating pressure	:	max. 10 bar
Material		
Sensor head	:	1.4305
Thermowell and sensor tip	:	1.4404
Protection class	:	IP67 / IP69K
CE conformity	:	EN 61326-1:2013 / -2-3:2013

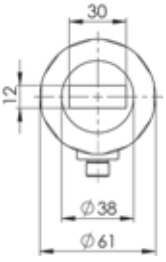
Transducer GMTL1

Measuring range	:	-10..+40 °C * / 0..50 °C * / 0..100 °C * 0..150 °C * / 0..200 °C * or freely in range -20..200 °C **
Power supply	:	10..30 V DC
Output	:	analog, 4..20 mA, 2-wire
Output signal in case of error	:	**< 3.75 mA** or > 21.5 mA, selectable *
Filter	:	integrated low-pass, 4-step *
Response time	:	< 150 ms (filter 0), **< 300 ms (filter 1)** < 800 ms (filter 2), < 3 s (filter 3)
Ambient temperature	:	-40..+70 °C
Accuracy	:	< 0.2 % FS
Temperature drift	:	< 0.01 % FS / K

Transducer GTML1 with on-site display

Transducer with integrated **on-site display (LCD)** only in combination with electric connection: cable connection M12 plug and integrated transducer (for further information see transducer GTML1).

Display	:	4-digit LCD
Displayed unit	:	**°C** or °F, selectable *
Resolution	:	**0.1 °C** or 1 °C, selectable *
Background illumination	:	**activatable**, deactivatable *
Working temperature	:	-20..+60 °C

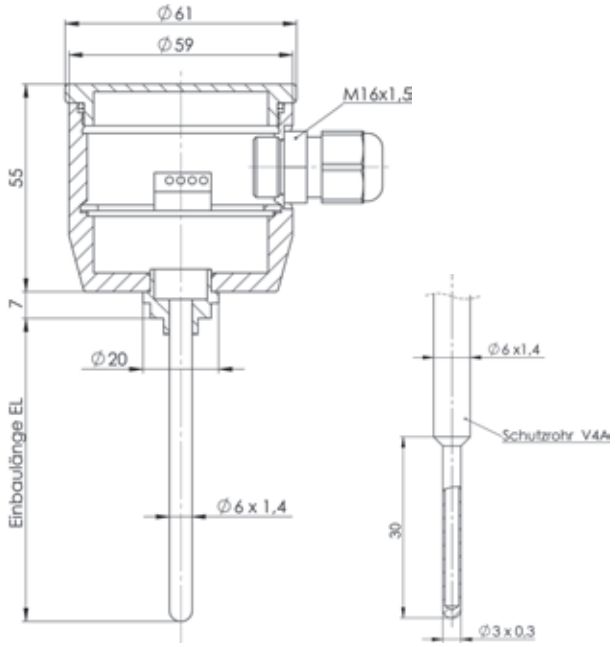


* Programmable via GTL - Configuration tool (accessories) or buttons (only with on-site display)

** Programmable via GTL - Configuration tool (accessories)

Note: The default settings are marked in **bold**.

Dimensions



Connection

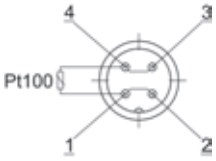
Electrical connection: cable gland M16x1.5 (PG)

without transducer (4-wire):

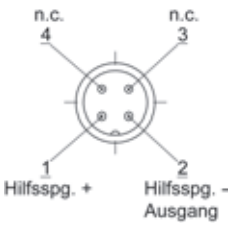
with transdcer (2-wire):

Electrical connection: M12-plug (1.4305)

without transducer (4-wire):



with transdcer (2-wire):



Product key

GTL 1. - 2. - 3. - 4. - 5. - 6. - 7. - 8. - 9.

1.	**Design type**	
	349	without thread
2.	**Electrical connection**	
	P	cable screwing M16x1.5 (PG)
	V	V2A cable screwing M16x1.5 (PG)
	M	cable connection M12-plug
3.	**Insertion length EL**	
	0050	50 mm
	0100	100 mm
	0150	150 mm
	0250	250 mm
	xxxx	any EL in mm (surcharge from 250 mm for each 100 mm started, up to max. fitting length: Ø 6: max. 1000 mm)
4.	**Diameter thermowell and sensor tip**	
	6	Ø 6 mm, without taper
	3	Ø 6 mm, with sensor tip Ø 3 mm
5.	**Accuracy class**	
	A	class A
	D	class AA (1/3 class B)
6.	**Transducer**	
	0	without transducer
	M	permanently integrated transducer GTML1, without display
	V	permanently integrated transducer GTML1, on-site display (LCD)
	R	exchangeable head transducer RT420
	T	exchangeable head transducer T19
7.	**Measuring range**	
	0	without transducer
	1	measuring range -10..+40 °C (-50..+50 °C for head transducer T19)
	2	measuring range 0..50 °C
	3	measuring range 0..100 °C
	4	measuring range 0..150 °C
	5	measuring range 0..200 °C
	B	transducer with special measuring range in °C (not possible for head transducer T19), state special measuring range separately e.g.: 0..75 °C or -20..+30 °C Mind the minimum range of 50 °C.
8.	**Option**	
	0	without transducer
	H	mit Halsrohr (100 mm)
9.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	WZ2.2	factory certification 2.2
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)
	APZ2P	acceptance test certificate 3.1 with 2 measuring points (0°C / 70°C)
	APZ3P	acceptance test certificate 3.1 with 3 measuring points (0°C, 70°C + 1 test point freely selectable)

Notes on on-site display (LCD):
Permanently integrated transducer GTML1 (programmable) with on-site display only in combination with electrical connection: M12 plug. Information on suitable compression insertions can be found in section Accessories.

Temperature sensor GTL 369 / 369M GTL 389 / 389M

- **Without tread**
- **Hygienic design and easy-to-sterilize measuring point**
- **Sensor completely made of stainless steel**

Characteristic

The temperature senors are designed for temperature measurements in pipes of different nominal diameters or thin-walled tubes and tanks.

They can be used for example for process monitoring at tube curvatures, temperature measurements in pressure pipes or at measurements of pasty media in pipes

The immersion length can be varied by use of compression fitting. The probes can be provided with different electric connections and with or without integrated head transmitter.

Specifications

Temperature ranges	: ambient	:	-40..+80 °C
	sensor tip	:	-40..+200 °C
	CIP- / SIP-temperature:		140 °C < 30 min.
Measuring resistor	: Pt100		
Accuracy	: class A, class AA		
Process connection	: no thread suitable weld-in sleeves e.g.: GKEV-25/76, GEMK-25/76		

Immersion length	: 50, 100, 150, 250 mm
Sensor head	: Ø 18 mm
Thermowell and sensor tip:	
Ø 6 mm	thermowell Ø 6 mm without taper
Ø 3 mm	thermowell Ø 6 mm and sensor tip Ø 3 mm
Response time	: FS Ø 3 mm: T_{90} ≤ 1.5 s FS Ø 6 mm: T_{90} ≤ 7.4 s
Operating pressure	: max. 10 bar
Material	
Sensor head	: 1.4305
Thermowell and tip	: 1.4404
Protection class	: IP67 / IP69K
CE conformity	: EN 61326-1:2013 / -2-3:2013

Design type

	GTL 369	GTL 389
Electrical connection	M12-plug, 4-pin (1.4305)	fixed cable 2.5 m, LIYY 389: 4 x 0,25 mm² 389M: 2 x 0,25 mm²

Transducer GTML2 (only for GTL 369M / GTL 389M)

Measuring range	: -10..+40 °C * / 0..50 °C * / 0..100 °C * 0..150 °C * / 0..200 °C * or freely in range -20..200 °C *
Power supply	: 10..30 V DC
Output	: analog, 4..20 mA, 2-wire
Output signal in case of error	: **< 3.75 mA** or > 21.5 mA, selectable *
Filter	: integrated low-pass, 4-step *
Response time	: < 150 ms (filter 0), **< 300 ms (filter 1)** < 800 ms (filter 2), < 3 s (filter 3)
Ambient temperature	: -40..+70 °C
Measurement accuracy	: < 0.2 % FS
Temperature drift	: < 0.01 % FS / K

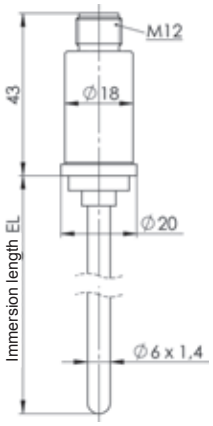
* Programmable via GTL - Configuration tool (accessories)

Note: The default settings are marked in **bold**.

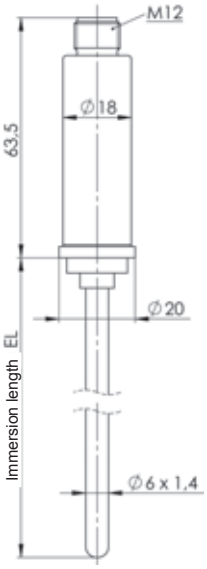
continued on next page

Dimensions

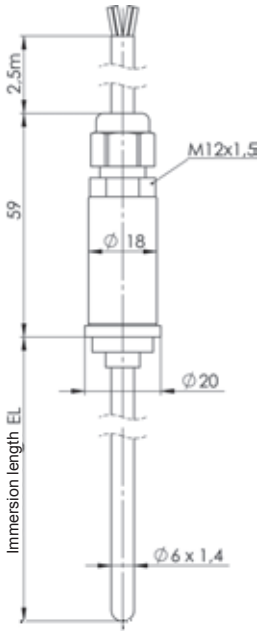
GTL 369



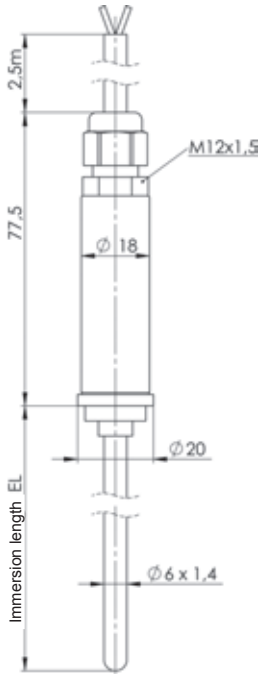
GTL 369M

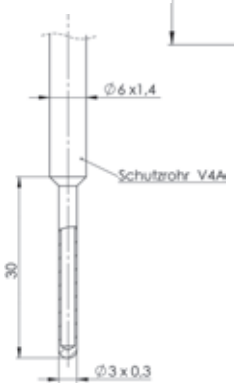


GTL 389



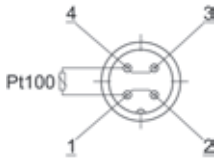
GTL 389M



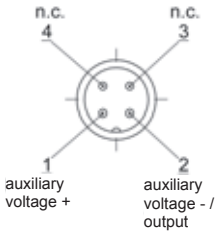


Connection

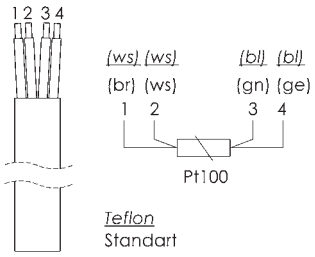
Design type GTL 369 or GTL 369M:
without transducer (4-wire):



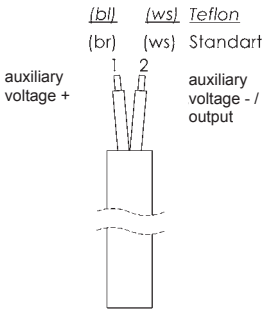
with transducer (2-wire):



Design type GTL 389 or GTL 389M:
without transducer (4-wire):



with transducer (2-wire):



Option

TK	Design type GTL 389 and GTL 389M with **Teflon cable** GTL 389: 4 x 0.14 mm² / GTL 389M: 2 x 0.14 mm² Teflon cable up to 200 °C

continued on next page

Product key

	1.		2.		3.		4.		5.		6.		7.
GTL		-		-		-		-		-		-	

1.	**Design type**	
	369	cable connection M12-plug,
	369M	cable connection M12-plug with integrated transducer
	389	fixed cable (PVC) connection 2.5m
	389M	fixed cable (PVC) connection 2.5m, with integrated transducer
2.	**Fitting length EL**	
	0050	50 mm
	0100	100 mm
	0150	150 mm
	0250	250 mm
	xxxx	any EL in mm (surcharge from 250 mm for each 100 mm started, up to max. fitting length: Ø 6: max. 1000 mm)
3.	**Diameter protection tube and probe tip**	
	6	Ø 6 mm, without taper
	3	Ø 6 mm, with tapered probe tip Ø 3 mm
4.	**Accuracy class**	
	A	class A
	D	class AA (1/3 class B)
5.	**Transducer GTML2 (programmable) ONLY for design types 369M and 389M**	
	00	without transducer (design types 369 / 389)
	M1	measuring range -10..+40 °C
	M2	measuring range 0..50 °C
	M3	measuring range 0..100 °C
	M4	measuring range 0..150 °C
	M5	measuring range 0..200 °C
	MB	transducer with special measuring range in °C (state special measuring range separately e.g.: 0..75 °C or -20..+30 °C Mind the minimum range of 50 °C.)
6.	**Option**	
	00	without option
	H	with spacer
	TK	Teflon cable for connection via fixed cable (only available for 389 and 389M) (surcharge per meter)
7.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	WZ2.2	factory certification 2.2
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)
	APZ2P	acceptance test certificate 3.1 with 2 measuring points (0°C / 70°C)
	APZ3P	acceptance test certificate 3.1 with 3 measuring points (0°C, 70°C + 1 test point freely selectable)

Information on suitable compression fittings can be found in section Accessories.

GREISINGER
Member of GHM GROUP

Temperature sensor GTL 459

In combination with APH G12

- **G 3/8 union nut**
- **Hygienic design and easy-to-sterilize measuring point**
- **Sensor completely made of stainless steel**

Characteristic

The temperature sensor are designed for temperature monitoring in pipes and tanks, temperature measurements in steam and pressure pipes (closed process) and for monitoring of CIP- / SIP- processes.

The sensor can be provided with different electric connections and with or without integrated head transmitter.

Specifications

Temperature ranges	:	ambiance: -40..+80 °C sensor tip: -40..+200 °C CIP- / SIP-temperature:140 °C < 30 min.
Measuring resistor	:	Pt100
Accuracy	:	class A, class AA
Electrical connection	:	cable gland M16x1.5 M12- plug (1.4305)
Process connection	:	immersion sleeve, G 3/8 outside thread suitable adapter and weld-in sleeves APHG12, APHK25, APHZ18 (see accessories page 64)

Tightening torque	:	hand-tight
Insertion length	:	37, 83, 97, 160 mm
Sensor head	:	Ø 59 mm

Thermowell and sensor tip:

Ø 3 mm	:	protection tube Ø 3 mm
Response time	:	T_{90} ≤ 1.5 s (without immersion sleeve) T_{90} ≤ 15 s (with immersion sleeve: *The use of heat transfer paste is recommended, because this can reduce the stated time by up to 50 %*)
Operating pressure	:	max. 10 bar

Material

Sensor head	:	1.4305 (V2A)
Thermowell and tip	:	1.4404 (V4A)
Union nut	:	1.4408 (V4A)

Protection class	:	IP67 / IP69K
CE conformity	:	EN 61326-1:2013 / -2-3:2013

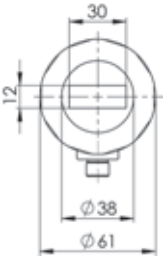
Transducer GMTL1

Measuring range	:	-10..+40 °C * / 0..50 °C * / 0..100 °C * 0..150 °C * / 0..200 °C * or freely in range -20..200 °C **
Power supply	:	10..30 V DC
Output	:	analog, 4..20 mA, 2-wire
Output signal in case of error	:	**< 3.75 mA** or > 21.5 mA, selectable *
Filter	:	integrated low-pass, 4-step *
Response time	:	< 150 ms (filter 0), **< 300 ms (filter 1)** < 800 ms (filter 2), < 3 s (filter 3)
Ambient temperature	:	-40..+70 °C
Accuracy	:	< 0.2 % FS
Temperature drift	:	< 0.01 % FS / K

Transducer GTML1 with on-site display

Transducer with integrated **on-site display (LCD)** only in combination with electric connection: cable connection M12 plug and integrated transducer (for further information see transducer GTML1).

Display	:	4-digit LCD
Displayed unit	:	**°C** or °F, selectable *
Resolution	:	**0.1 °C** or 1 °C, selectable *
Background illumination	:	**activatable**, deactivatable *
Ambient temperature	:	-20..+60 °C



* Programmable via GTL - Configuration tool (accessories) or buttons (only with on-site display)

** Programmable via GTL - Configuration tool (accessories)

Note: The default settings are marked in **bold**.

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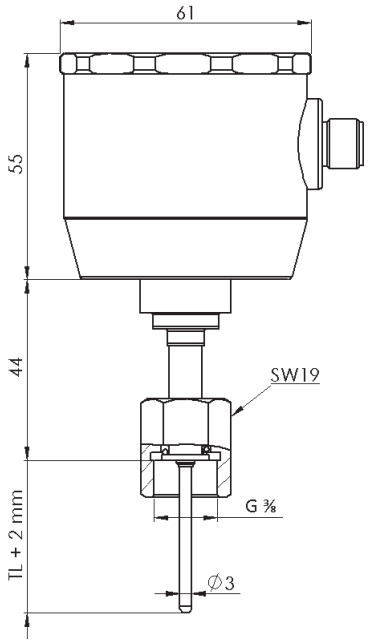
Dimensions

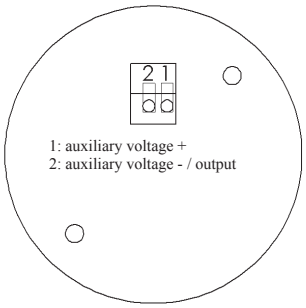


Connection

Electrical connection: cable gland M16x1.5

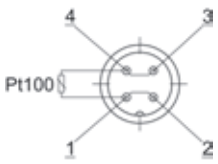
without transducer (4-wire):

with transducer (2-wire):

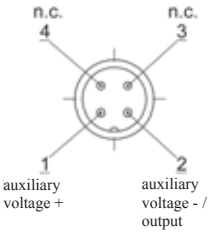


Electrical connection: M12-plug (1.4305)

without transducer (4-wire):



with transducer (2-wire):



Product key

GTL 1. - 2. - 3. - 4. - 5. - 6. - 7. - 8. - 9.

1.	**Design type**	
	459	G 3/8 with union nut
2.	**Electrical connection**	
	P	cable gland M16x1.5
	V	V2A cable gland M16x1.5
	M	M12-plug
3.	**Immersion length TL**	
	0037	37 mm
	0083	83 mm
	0097	97 mm
	0160	160 mm
	xxxx	any TL in mm: from 200 mm till max. 500 mm, (surcharge from 200 mm for each 100 mm started)
4.	**Diameter thermowell and sensor tip**	
	3	Ø 3 mm
5.	**Accuracy class**	
	A	class A
	D	class AA (1/3 class B)
6.	**Transducer**	
	0	without transducer
	M	permanently integrated transducer GTML1, without display
	V	permanently integrated transducer GTML1, on-site display (LCD)
	R	exchangeable head transducer RT420
	T	exchangeable head transducer T19
7.	**Measuring range**	
	0	without transducer
	1	measuring range -10..+40 °C (-50..+50 °C for head transducer T19)
	2	measuring range 0..50 °C
	3	measuring range 0..100 °C
	4	measuring range 0..150 °C
	5	measuring range 0..200 °C
	B	transducer with special measuring range in °C (not possible for head transducer T19), state special measuring range separately e.g.: 0..75 °C or -20..+30 °C Mind the minimum range of 50 °C.
8.	**Option**	
	00	without Option
	H	With spacer
9.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	WZ2.2	factory certification 2.2
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)
	APZ2P	acceptance test certificate 3.1 with 2 measuring points (0°C / 70°C)
	APZ3P	acceptance test certificate 3.1 with 3 measuring points (0°C, 70°C + 1 test point freely selectable)

Notes on on-site display (LCD): Permanently integrated transducer GTML1 (programmable) with on-site display only in combination with electrical connection: M12 plug. Information on suitable adapter and weld-in sleeves can be found in section Accessories.

GREISINGER
Member of GHM GROUP

Temperature sensor GTL 479 / 479M GTL 499 / 499M

GTL 479 GTL 479M GTL 499M

- **G 3/8" union nut**
- **Hygienic design and easy-to-sterilize measuring point**
- **Sensor completely made of stainless steel**

Characteristic

The temperature sensors are designed for temperature monitoring in pipes and tanks, temperature measurements in steam and pressure pipes (closed process) and for monitoring of CIP- / SIP- processes.

The sensors can be provided with different electric connections and with or without integrated head transmitter.

Specifications

Temperature ranges	:	ambient: -40..+80 °C process: -40..+200 °C CIP- / SIP-temperature:140 °C < 30 min.
Measuring resistor	:	Pt100
Accuracy	:	class A, class AA
Process connection	:	immersion sleeve, G 3/8" outside thread suitable adapter and weld-in sleeves APHG12, APHK25, APHZ18 (see accessories page 64)

Tighting torque	:	hand-tight
Immersion length	:	37, 83, 97, 160 mm
Sensor head	:	Ø 18 mm

Thermowell and sensor tip:

Ø 3 mm	:	thermowell Ø 3 mm
Response time	:	T_{90} ≤ 1.5 s (without immersion sleeve) *T_{90} ≤ 15 s (with immersion sleeve: The use of heat transfer paste is recommended, because this can reduce the stated time by up to 50 %)*
Operating pressure	:	max. 10 bar
Material		
Sensor head	:	1.4305
Thermowell and sensor tip	:	1.4404
Union nut	:	1.4408
Protection class	:	IP67 / IP69K
CE conformity	:	EN 61326-1:2013 / -2-3:2013

Design type

	GTL 479 / 479M	GTL 499 / 499M
Electrical connection	M12-plug, 4-pin (1.4305)	fixed cable 2.5 m LIYY 499: 4 x 0.25 mm² 499M: 2 x 0.25 mm²

Transducer GTML2 (only for GTL 479M / GTL 499M)

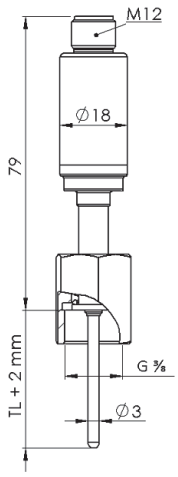
Measuring range	:	-10..+40 °C * / 0..50 °C * / 0..100 °C * 0..150 °C * / 0..200 °C * or freely in range -20..200 °C *
Power supply	:	10..30 V DC
Output	:	analog, 4..20 mA, 2-wire
Output signal in case of error	:	**< 3.75 mA** or > 21.5 mA, selectable *
Filter	:	integrated low-pass, 4-step *
Response time	:	< 150 ms (filter 0), **< 300 ms (filter 1)** < 800 ms (filter 2), < 3 s (filter 3)
Ambient temperature	:	-40..+70 °C
Accuracy	:	< 0.2 % FS
Temperature drift	:	< 0.01 % FS / K

* Programmable via GTL - Configuration tool (accessories)

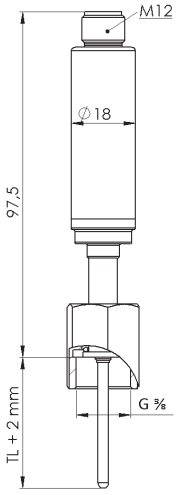
Note: The default settings are marked in **bold**.

continued on next page

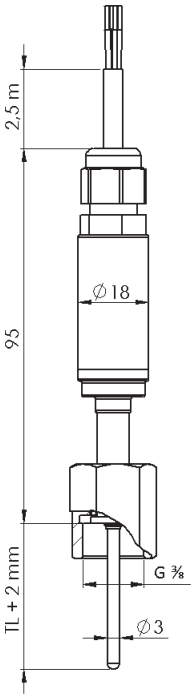
Dimensions



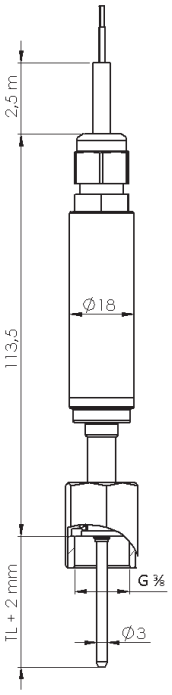
GTL 479



GTL 479M



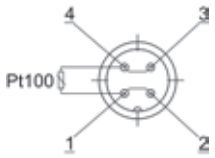
GTL 499



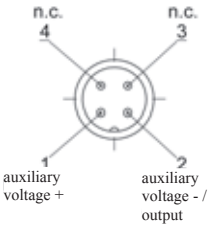
GTL 499M

Connection

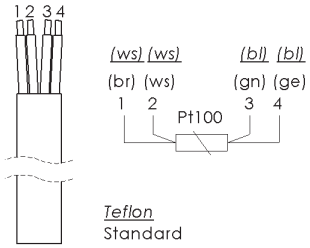
Design type GTL 479 or GTL 479M:
without transducer (4-wire):



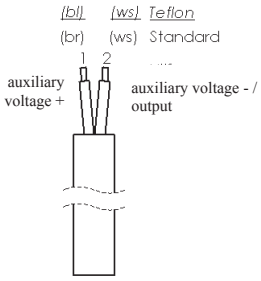
with transducer (2-wire):



Design type GTL 499 or GTL 499M:
without transducer (4-wire):



with transducer (2-wire):



Option

TK	Design type GTL 499 and GTL 499M with **Teflon cable** GTL 499: 4 x 0.14 mm² / GTL 499M: 2 x 0.14 mm² Teflon cable up to 200 °C

continued on next page

Product key

	1.		2.		3.		4.		5.		6.		7.
GTL		-		-		-		-		-		-	

1.	**Design type (electrical connection)**	
	479	M12-plug
	479M	M12-plug with integrated transducer
	499	fixed cable (PVC) connection 2.5m
	499M	fixed cable (PVC) connection 2.5m, with integrated transducer
2.	**Immersion length TL**	
	0037	37 mm
	0083	83 mm
	0097	97 mm
	0160	160 mm
	xxxx	any TL in mm: from 200 mm till max. 500 mm, (surcharge from 200 mm for each 100 mm started)
3.	**Diameter thermowell and sensor tip**	
	3	Ø 3 mm
4.	**Accuracy class**	
	A	class A
	D	class AA (1/3 class B)
5.	**Transducer GTML2 (programmable) ONLY for design types 479M and 499M**	
	00	without transducer (design types 369 / 389)
	M1	measuring range -10..+40 °C
	M2	measuring range 0..50 °C
	M3	measuring range 0..100 °C
	M4	measuring range 0..150 °C
	M5	measuring range 0..200 °C
	MB	transducer with special measuring range in °C (state special measuring range separately e.g.: 0..75 °C or -20..+30 °C Mind the minimum range of 50 °C.)
6.	**Option**	
	00	without option
	H	with spacer
	TK	Teflon cable for connection via fixed cable (only available for 499 and 499M) (surcharge per meter)
7.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	WZ2.2	factory certification 2.2
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)
	APZ2P	acceptance test certificate 3.1 with 2 measuring points (0°C / 70°C)
	APZ3P	acceptance test certificate 3.1 with 3 measuring points (0°C, 70°C + 1 test point freely selectable)

Information on suitable adapter and weld-in sleeves can be found in section Accessories.

Temperature probe with double-Pt100 Head Ø 59 mm

- **Hygienic design and easy-to-sterilize measuring point**
- **Sensor completely made of stainless steel**
- **Redundant temperature measurement in one sensor**

Characteristic

The temperature probes are designed for temperature monitoring in pipes and tanks, temperature measurements in steam and pressure pipes and for monitoring of CIP- / SIP- processes.

The probes can be provided with different electric connections and with or without integrated head transmitter.

Specifications

Temperature ranges	:	ambiance: -40..+80 °C probe tip: -40..+200 °C CIP- / SIP-temperature:140 °C < 30 min.
Measuring resistor	:	2 x Pt100
Accuracy	:	class A, class AA
Process connection	:	M12, G ½, G ½ standard, without thread, G ⅜
Clamping torque	:	M12 - 5..10 Nm
	:	G ½ - 5..20 Nm
	:	G ⅜ - hand-tight
Fitting length	:	50, 100, 150, 250 mm
Probe head	:	Ø 59 mm
Protection tube and probe tip:		
Ø 6 mm	:	protection tube without taper
Ø 4 mm	:	protection tube without taper (only for GTL 142.2 and GTL 152.2)
Ø 3 mm	:	protection tube Ø 6 mm and tapered probe tip Ø 3 mm
Response time	:	FS Ø 3 mm: T_{90} ≤ 1.5 s FS Ø 4 mm: T_{90} ≤ 3.6 s FS Ø 6 mm: T_{90} ≤ 7.4 s
Working pressure	:	max. 10 bar
Material		
Probe head	:	1.4305 (V2A)
Neck tube	:	1.4305 (V2A)
Protection tube and tip	:	1.4404 (V4A)
Protection class	:	IP67 / IP69K
CE conformity	:	EN 61326-1:2006 / -2-3:2006

Transducer GTML1

Integrated head transmitter

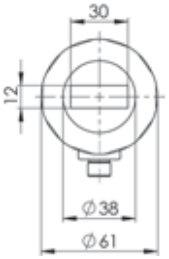
Measuring range	:	-10..+40 °C * / 0..50 °C * / 0..100 °C * 0..150 °C * / 0..200 °C * or freely in range -20..200 °C **
Power supply	:	10..30 V DC
Measuring output	:	analog, 4..20 mA, 2-wire
Output signal in case of error	:	**< 3.75 mA** or > 21.5 mA, selectable *
Filter	:	integrated low-pass, 4-step *
Reaction time	:	< 150 ms (filter 0), **< 300 ms (filter 1)** < 800 ms (filter 2), < 3 s (filter 3)
Working temperature	:	-40..+70 °C
Accuracy	:	< 0.2 % FS
Temperature drift	:	< 0.01 % FS / K

continued on next page

Transducer GTML1 with on-site display

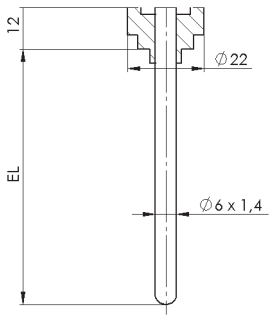
Transducer with integrated **on-site display (LCD)** only in combination with electric connection: cable connection M12 plug and integrated transducer (for further information see transducer GTML1).

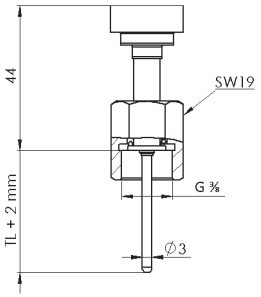
Display	:	4-digit LCD
Displayed unit	:	**°C** or °F, selectable *
Resolution	:	**0.1 °C** or 1 °C, selectable *
Background illumination	:	**activatable**, deactivatable *
Working temperature	:	-20..+60 °C

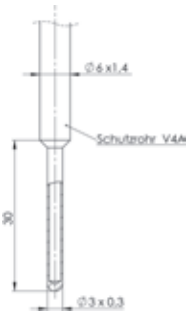


* Programmable via GTL - Configuration tool (accessories) or buttons (only with on-site display)
** Programmable via GTL - Configuration tool (accessories)

Note: The default settings are marked in **bold**.

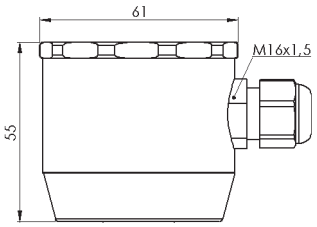


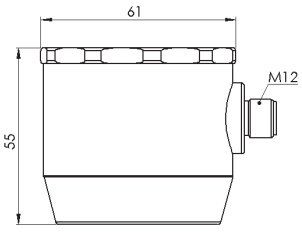




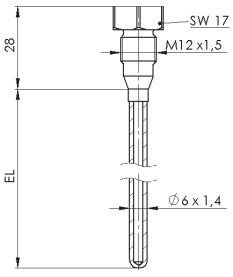
Dimensions

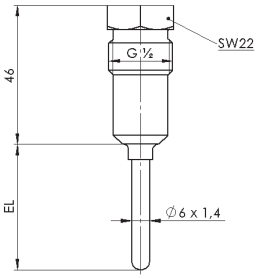
Probe head

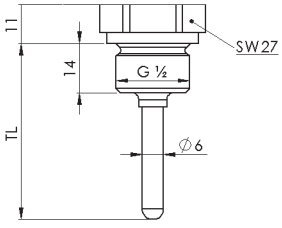




Process connection





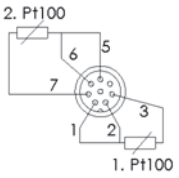


Connection

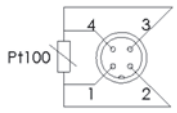
Electric connection: cable connection M12-plug

without transducer:

with 1 x 8-Pol-M12-plug:

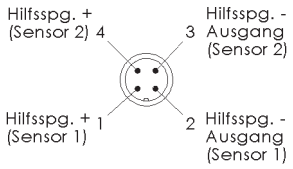


with 2 x M12-plug

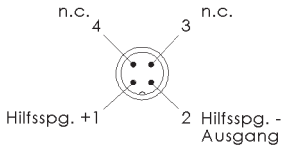


with transducer:

with 1 x M12-plug

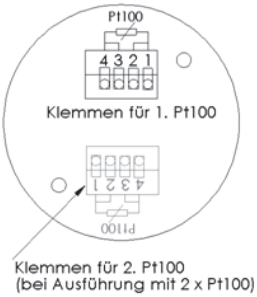


with 2 x M12-plug (sensor 1 and 2)



Electric connection: cable screwing M16x1.5 (PG)

without transducer



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Product key

	1.		2.		3.		4.		5.		6.		7.		8.		9.		10.
GTL		-		-		-		-		-		-		-		-		

1.	Design type	
	142.2	thread M12 hygienic, without neck tube
	152.2	thread M12 hygienic, with neck tube (100 mm)
	241.2	thread G ½ hygienic, without neck tube
	251.2	thread G ½ hygienic, with neck tube (100 mm)
	240.2	thread G ½ standard, without neck tube
	250.2	thread G ½ standard, with neck tube (100 mm)
	349.2	without thread
	459.2	G ⅜ with union nut
2.	**Electric connection**	
	P	1 x cable screwing M16x1.5 (PG) (see note below)
	V	1 x V2A cable screwing M16x1.5 (PG) (see note below)
	M	1 x cable connection M12 plug (at design type without transducer: 8-pole M12 plug)
	2P	2 x cable screwing M16x1.5 (PG) (see note below)
	2V	2 x V2A cable screwing M16x1.5 (PG) (see note below)
	2M	2 x cable connection M12 plug
3.	**Fitting length EL or immersion length TL** (not for GTL 459.2: see product information GTL 459)	
	0050	50 mm
	0100	100 mm
	0150	150 mm
	0250	250 mm
	xxxx	any EL in mm (e.g. 320 = 320 mm) Ø 6: max. 1000 mm, Ø 4: max. 500 mm
4.	**Diameter protection tube and probe tip** (not for GTL 459.2: see product information GTL 459)	
	6	Ø 6 mm, without taper
	4	Ø 4 mm, without taper (not for GTL 142.2 and GTL 152.2)
	3	Ø 6 mm, with tapered probe tip Ø 3 mm
5.	**Accuracy class**	
	A	class A
	D	class AA (1/3 class B)
6.	**1st Transducer**	
	0	without transducer
	M	permanently integrated transducer GTML1, without display
	V	permanently integrated transducer GTML1, on-site display (LCD)

7.	Measuring range 1st transducer	
	0	without transducer
	1	measuring range -10..+40 °C (-50..+50 °C for head transducer T19)
	2	measuring range 0..50 °C
	3	measuring range 0..100 °C
	4	measuring range 0..150 °C
	5	measuring range 0..200 °C
	B	transducer with special measuring range in °C, state special measuring range separately e.g.: 0..75 °C or -20..+30 °C Mind the minimum range of 50 °C.
8.	**2nd transducer**	
	0	without transducer
	M	permanently integrated transducer GTML1, without display
09. 09. 13	**Measuring range 2nd transducer**	
	0	without transducer
	1	measuring range -10..+40 °C (-50..+50 °C for head transducer T19)
	2	measuring range 0..50 °C
	3	measuring range 0..100 °C
	4	measuring range 0..150 °C
	5	measuring range 0..200 °C
	B	transducer with special measuring range in °C, state special measuring range separately e.g.: 0..75 °C or -20..+30 °C Mind the minimum range of 50 °C.
10.	**Option**	
	00	without option

Note:
1) Design type with 2 x transducer only in combination with electrical connection: cable connection M12 plug
2) For the configuration of the second transducer via GTL Configuration tool at design type 1 x cable connection M12 plug a connection cable KM4P-GTL34 is necessary (see accessories at the end of this PI).

Information on suitable weld-in sleeves for “tread M12 hygienic” and “thread G ½ hygienic” can be found in product information GHM*adapt*/Accessories. Suitable compression fittings for design type “without thread” can be found in chapter accessories at page 63. Suitable adapter / weld-in sleeves for design type “G ⅜ with union nut” can be found in chapter accessories at page 64 and for design type “G ½ standard” at page 65.

Temperature probe with double-Pt100 Head Ø 18 mm

- **Hygienic design and easy-to-sterilize measuring point**
- **Sensor completely made of stainless steel**
- **Redundant temperature measurement in one sensor**

Characteristic

The temperature probes are designed for temperature monitoring in pipes and tanks, temperature measurements in steam and pressure pipes and for monitoring of CIP- / SIP- processes.

The probes can be provided with different electric connections and with or without integrated head transmitter.

Specifications

Temperature ranges	:	ambiance: -40..+80 °C probe tip: -40..+200 °C CIP- / SIP-temperature: 140 °C < 30 min.
Measuring resistor	:	2 x Pt100
Accuracy	:	class A, class AA
Process connection	:	M12, G ¼, G ½ standard, without thread, G ⅜
Clamping torque	:	M12 - 5..10 Nm
	:	G ¼ - 5..20 Nm
	:	G ⅜ - hand-tight
Fitting length	:	50, 100, 150, 250 mm
Probe head	:	Ø 18 mm
Protection tube and probe tip:		
Ø 6 mm		protection tube without taper
Ø 4 mm		Ø 4 mm, without taper (only for M12 thread hygienic)
Ø 3 mm		protection tube Ø 6 mm and tapered probe tip Ø 3 mm
Response time	:	FS Ø 3 mm: T_{90} ≤ 1.5 s FS Ø 4 mm: T_{90} ≤ 3.6 s FS Ø 6 mm: T_{90} ≤ 7.4 s
Working pressure	:	max. 10 bar
Material		
Probe head	:	1.4305 (V2A)
Protection tube and tip	:	1.4404 (V4A)
Protection class	:	IP67 / IP69K
CE conformity	:	EN 61326-1:2006 / -2-3:2006

Transducer GTML2

Integrated head transmitter

Measuring range	:	-10..+40 °C * / 0..50 °C * / 0..100 °C * 0..150 °C * / 0..200 °C * or freely in range -20..200 °C *
Power supply	:	10..30 V DC
Measuring output	:	analog, 4..20 mA, 2-wire
Output signal in case of error	:	**< 3.75 mA** or > 21.5 mA, selectable *
Filter	:	integrated low-pass, 4-step *
Reaction time	:	< 150 ms (filter 0), **< 300 ms (filter 1)** < 800 ms (filter 2), < 3 s (filter 3)
Working temperature	:	-40..+70 °C
Accuracy	:	< 0.2 % FS
Temperature drift	:	< 0.01 % FS / K

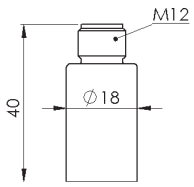
* Programmable via GTL - Configuration tool (accessories)

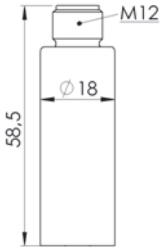
Note: The default settings are marked in **bold**.

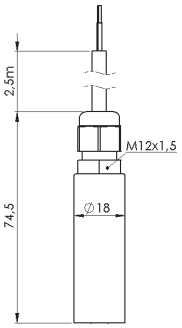
continued on next page

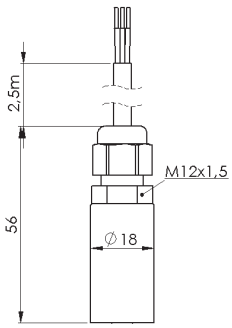
Dimensions

Probe head

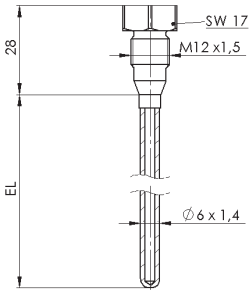


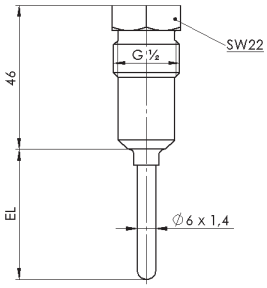


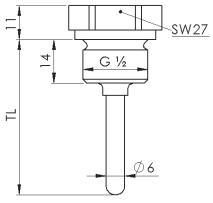


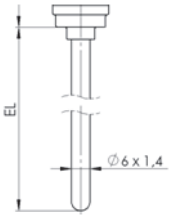


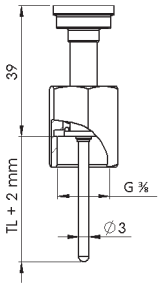
Process connection

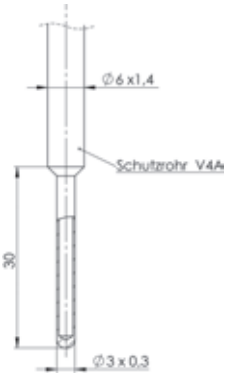










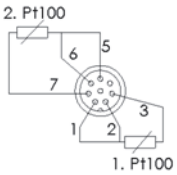


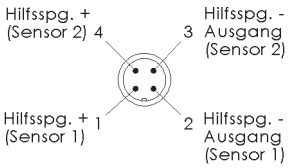
Connection

Electric connection: cable connection M12-plug

without transducer: with transducer:

with 1 x 8-Pol-M12-plug: **with 1 x MR-plug:**

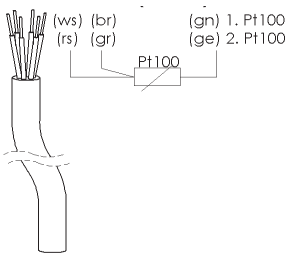


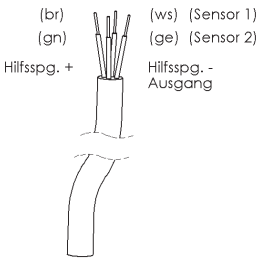


Electric connection: fixed cable (PVC)

without transducer: with transducer:

2 x Pt100 (3-wire): **2 x Pt100:**





Option

TK	with Teflon cable up to 200 °C

Product key

GTL 1. - 2. - 3. - 4. - 5. - 6. - 7.

1.	Design type	
	162.2	thread M12 hygienic, connection via 8-pole M12-plug, no transducer
	162M.2	thread M12 hygienic, connection via M12-plug, 2 x integrated transducer
	182.2	thread M12 hygienic, connection via fixed cable (PVC) 2.5 m, no transducer
	182M.2	thread M12 hygienic, connection via fixed cable (PVC) 2.5 m, 2 x integrated transducer
	261.2	thread G ½ hygienic, connection via 8- pole M12-plug, no transducer
	261M.2	thread G ½ hygienic, connection via M12-plug, 2 x integrated transducer
	281.2	thread G ½ hygienic, connection via fixed cable (PVC) 2.5 m, no transducer
	281M.2	thread G ½ hygienic, connection via fixed cable (PVC) 2.5 m, 2 x integrated transducer
	260.2	thread G ½ standard, connection via 8- pole M12-plug, no transducer
	260M.2	thread G ½ standard, connection via M12-plug, 2 x integrated transducer
	280.2	thread G ½ standard, connection via fixed cable (PVC) 2.5 m, no transducer
	280M.2	thread G ½ standard, connection via fixed cable (PVC) 2.5 m, 2 x integrated transducer
	369.2	without thread, connection via 8- pole M12-plug, no transducer
	369M.2	without thread, connection via M12-plug, 2 x integrated transducer
	389.2	without thread, connection via fixed cable (PVC) 2.5 m, no transducer
	389M.2	without thread, connection via fixed cable (PVC) 2.5 m, 2 x integrated transducer
	479.2	G ⅜ with union nut, connection via 8- pole M12-plug, no transducer
	479M.2	G ⅜ with union nut, connection via M12-plug, 2 x integrated transducer
	499.2	G ⅜with union nut , connection via fixed cable (PVC) 2.5 m, no transducer
	499M.2	G ⅜ with union nut, connection via fixed cable (PVC) 2.5 m, 2 x integrated transducer
2.	**Fitting length EL or immersion length TL** (not for design type with G ⅜ thread: see product information GTL 479)	
	0050	50 mm
	0100	100 mm
	0150	150 mm
	0250	250 mm
	xxxx	any EL in mm (e.g. 320 = 320 mm) Ø 6: max. 1000 mm, Ø 4: max. 500 mm

3.	**Diameter protection tube and probe tip** (not for design type with G ⅜ thread: see product information GTL 479)	
	6	Ø 6 mm, without taper
	4	Ø 4 mm, without taper
	3	Ø 6 mm, with tapered probe tip Ø 3 mm
4.	**Accuracy class**	
	A	class A
	D	class AA (1/3 class B)
5.	**1st transducer GTML2 (programmable)**	
	00	without transducer
	M1	measuring range -10..+40 °C
	M2	measuring range 0..50 °C
	M3	measuring range 0..100 °C
	M4	measuring range 0..150 °C
	M5	measuring range 0..200 °C
	MB	transducer with special measuring range in °C (state special measuring range separately e.g.: 0..75 °C or -20..+30 °C) Mind the minimum range of 50 °C.
6.	**2nd Transducer GTML2 (programmable)**	
	00	without transducer
	M1	measuring range -10..+40 °C
	M2	measuring range 0..50 °C
	M3	measuring range 0..100 °C
	M4	measuring range 0..150 °C
	M5	measuring range 0..200 °C
	MB	transducer with special measuring range in °C (state special measuring range separately e.g.: 0..75 °C or -20..+30 °C) Mind the minimum range of 50 °C.
7.	**Option**	
	00	without option
	H	with neck tube (100 mm)
	TK	Teflon cable for connection via fixed cable (not for design type with M12 plug)

Note:
1) Information on suitable compression fittings and weld-in sleeves can be found in product information GHM*adapt*/Accessories.
2) For the configuration of the second transducer via GTL Configuration tool at design type 1 x cable connection M12 plug a connection cable KM4P-GTL34 is necessary (see accessories at the end of this PI).

Information on suitable weld-in sleeves for “tread M12 hygienic” and “thread G ½ hygienic” can be found in product information GHM*adapt*/Accessories. Suitable compression fittings for design type “without thread” can be found in chapter accessories at page 63. Suitable adapter / weld-in sleeves for design type “G ⅜ with union nut” can be found in chapter accessories at page 64 and for design type “G ½ standard” at page 65.

Clamp-on temperature sensor GTL720/GTL723

- **Simple mounting via clamp-on adapter without media contact**
- **High accuracy even without thermal compound**
- **Fast response time**
- **Replacing/cleaning of the sensor without process interruption**
- **Pt100 Sensor 3-wire connection of transmitter 4..20 mA, 2-wire connection**
- **Transmitter programmable via GTL Configuration tool**
- **GTL720 applicable for Ex areas**

Characteristics

Clamp-on temperature sensors GTL720 and GTL723 are specified to measure temperatures without media contact.
The measuring tip is directly located at the pipe wall and will be fixed by the clamp-on adapter on the pipe. This measuring process provides a high accuracy and a fast response time, which is often better than a measuring principle with media contact.

Technical data

Temperature sensor : Pt100, class A acc. to DIN EN 60751

GTL720 *without transmitter*

Measuring range : -20..+160 °C
Working temperature : -20..+85 °C
Storing conditions : with yellow protective cap
Temp. : -20..+70 °C
max. rel. humidity 70%
Ex protection : Ex II 2G [Ex ia] IIC T3/T4/T5
(simple apparatus)
Ui = 30 V, Ii = 25 mA, Pi = 30 mW

GTL723 *with transmitter*

Measuring range : -20..+100 °C, short time 160 °C < 30 min,
(option 01 = max. 160 °C permanent)
programmable,
minimal measuring span 50 °C
Working temperature : -20..+60 °C
Storing conditions : with yellow protective cap
Temp. : -20..+70 °C
max. rel. humidity 70%

Protection class : IP67
(in connection with mounted M12 plug)

Electrical connection

Round plug : 4-pole M12x1
tightening torque 0,6 Nm

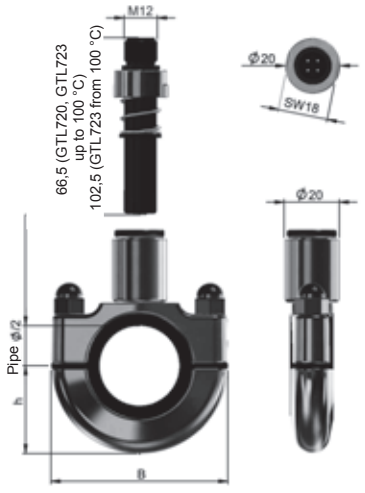
GTL720
Pt100 sensor current : max. 10 mA (recommended 0.3..1 mA)
GTL723
Supply voltage : 10..30 V DC, 2-wire connection
Error indication : programmable
Load : (U_b – 10V) /23 mA
Response time/accuracy [1]
Data without thermal compound, medium temperature 120 °C
Response time T_{90} : approx. 10 s
Accuracy : up to 2.5 % f.s. without pipe wall adjustment
: up to 0.6 % f.s. with pipe wall adjustment [2]
Data with thermal compound, medium temperature 120 °C
Response time T_{90} : approx. 3 s
Accuracy : up to 1 % f.s. without pipe wall adjustment
: up to 0.2 % f.s. with pipe wall adjustment [2]
Temperature coefficient : 0.02 %/°C

[1] Measurement results depending on the mounting situation.
See next page
[2] Measuring values are valid for GTL723

Output : 4..20 mA

Material
Sensor
Spring : 1.4310
Sensor usage : PEEK
Sensor tip : 935er silver
Lid : 1.4305
M12 plug : PA/gold plated contacts
Weight : 17 g
Clamp-on adapter
Adapter : 1.4405
Housing : 1.4305
Adapter insertion : silicone HTV/PTFE
Weight
Frame size 1 : 120 g
Frame size 2 : 170 g
Frame size 3 : 395 g
Frame size 4 : 955 g

Dimensions

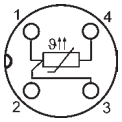


Frame size (Bg)	Pipe Ø [mm]	B [mm]	h [mm]	A/F [mm]
1	13.0..19.9	51	26	11
2	20.0..33.9	64	32	11
3	34.0..53.0	92	46	14
4a	60.3..75.9	133	68	14
4b	76.0..88.9	133	68	14

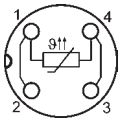
Connection diagrams

GTL720 passive sensor

Connection variant 1
(GHM standard)



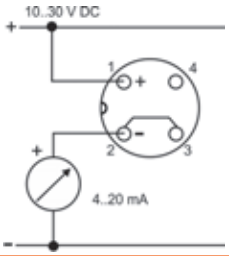
Connection variant 2
(customized)



GTL723 Transmitter

Supply voltage

Analog output



Ordering code

Note: In place order please specify the clamp-on sensor and the clamp-on adapter.

Order example:
Clamp-on sensor **GTL** without transmitter,
with clamp-on adapter **RLA** for DN32:
GTL720-0-00-0-00 + RLA424-00

Clamp-on temperature sensor

GTL [1.] - [2.] - [3.] - [4.] - [5.] - [6.]

1.	**Design / input**	
	720	Pt100 (applicable in Ex-areas)
	723	Pt100 with transmitter 4..20 mA
2.	**Electrical connection**	
	0	GTL720 variant 1 (GHM standard), M12 plug
	1	GTL720 variant 2 (customized), M12 plug
	2	GTL723 2-wire, 4..20 mA, M12 plug
3.	**Transmitter GTL723, default ranges** (programmable with GTL - Configuration tool via PC)	
	00	without transmitter (only GTL720)
	M1	measuring range -10..+40 °C
	M2	measuring range 0..50 °C
	M3	measuring range 0..100 °C
	M4	measuring range 0..150 °C temperatures > 100 °C max. 30 min
	MB	transmitter with special measuring range in °C (state special measuring range separately e.g.: 20..130 °C)
4.	**Pipe wall adjustment for stainless steel type pipes**	
	0	not active
	1	without thermal compound (only GTL723)
	2	with thermal compound (only GTL723)
5.	**Options**	
	00	without option
	01	high temperature version for GTL723; max. permanent temperature 160°C
6.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	WZ2.2	factory certification 2.2
	APZ3P	acceptance test certificate 3.1 with 3 measuring points (0°C, 70°C + 1 test point freely selectable)

Clamp-on adapter

RLA [1.] - [2.]

1.	**Pipe diameter**	
120	12,0 mm: DN10	DIN 11850 Reihe 1
130	13,0 mm: DN10	DIN 11850 Reihe 2
	12,7 mm: ½“	DIN 11866 Reihe C / ASME-BPE
135	13,5 mm: DN8	DIN 11866 Reihe B (ISO 1127)
172	17,2 mm: DN10	DIN 11866 Reihe B (ISO 1127)
180	18,0 mm: DN15	DIN 11850 Reihe 1
190	19,0 mm: DN15	DIN 11850 Reihe 2
	19,0 mm: ¾“	DIN 11866 Reihe C / ASME-BPE
213	21,3 mm: DN15	DIN11866 Reihe B
230	23,0 mm: DN20	DIN11850 Reihe 2
254	25,4 mm: 1 "	DIN11866 Reihe C / ASME-BPE
269	26,9 mm: DN20	DIN11866 Reihe B
280	28,0 mm: DN25	DIN11850 Reihe 1
290	29,0 mm: DN25	DIN11850 Reihe 2
337	33,7 mm: DN25	DIN11866 Reihe B
	34,0 mm: DN32	DIN11850 Reihe 1
350	35,0 mm: DN32	DIN11850 Reihe 2
381	38,1 mm: 1 ½ "	DIN11866 Reihe C / ASME-BPE
400	40,0 mm: DN40	DIN11850 Reihe 1
410	41,0 mm: DN40	DIN11850 Reihe 2
424	42,4 mm: DN32	DIN11866 Reihe B
483	48,3 mm: DN40	DIN11866 Reihe B
508	50,8 mm: 2 "	DIN11866 Reihe C / ASME-BPE
520	52,0 mm: DN50	DIN11850 Reihe 1
530	53,0 mm: DN50	DIN11850 Reihe 2
603	60,3 mm: DN50	DIN11866 Reihe B
635	63,5 mm: 2 ½“	DIN11866 Reihe C / ASME-BPE
700	70,0 mm: DN65	DIN11850 Reihe 2
761	76,1 mm: DN65	DIN11866 Reihe B
	76,2 mm: 3“	DIN11866 Reihe C / ASME-BPE
850	85,0 mm: DN80	DIN11850 Reihe 2
889	88,9 mm: DN80	DIN11866 Reihe B
999	customized diameter on request	
2.	**Options**	
	00	without option

Accessories:
Thermal compound
Type
WLP10S, containing silicone,
- high thermal conductivity of 10.0 W/mK
- not drying out, silicone parts not fleeting
- storage time up to 12 months at normal ambient conditions, from production date
- syringe containing 3 ml + pipette
- color: silver gray

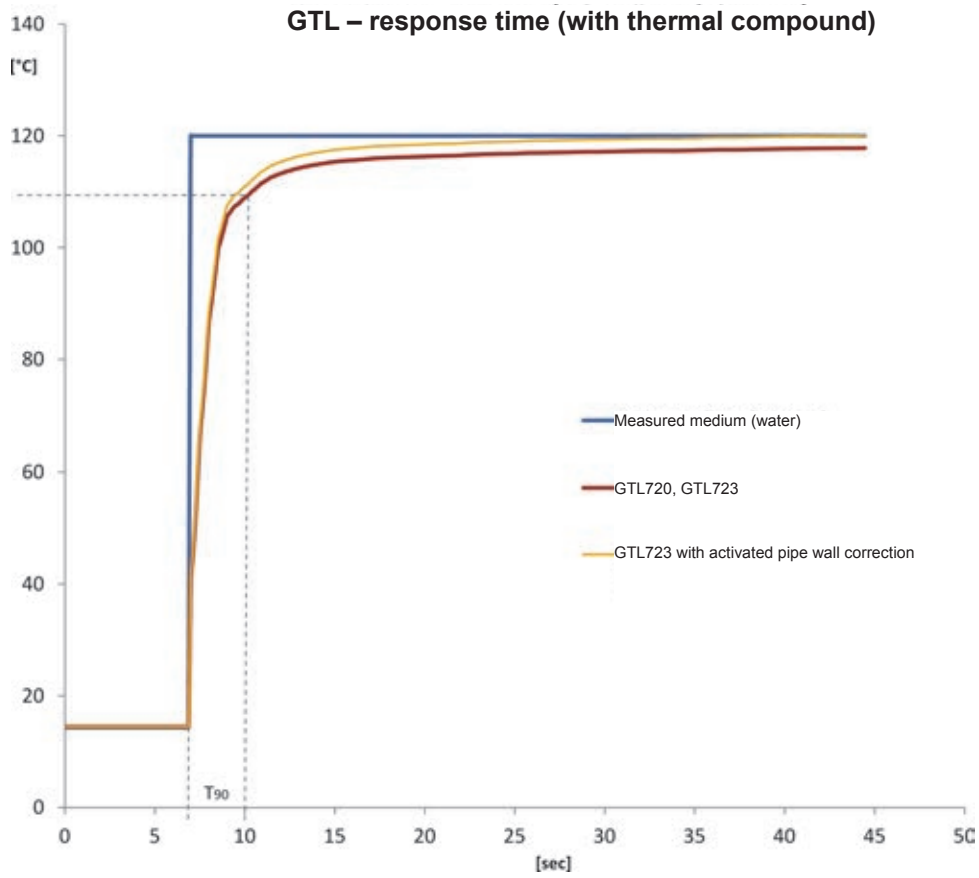
GTL – Configuration tool
- programming the GTL7xx via PC

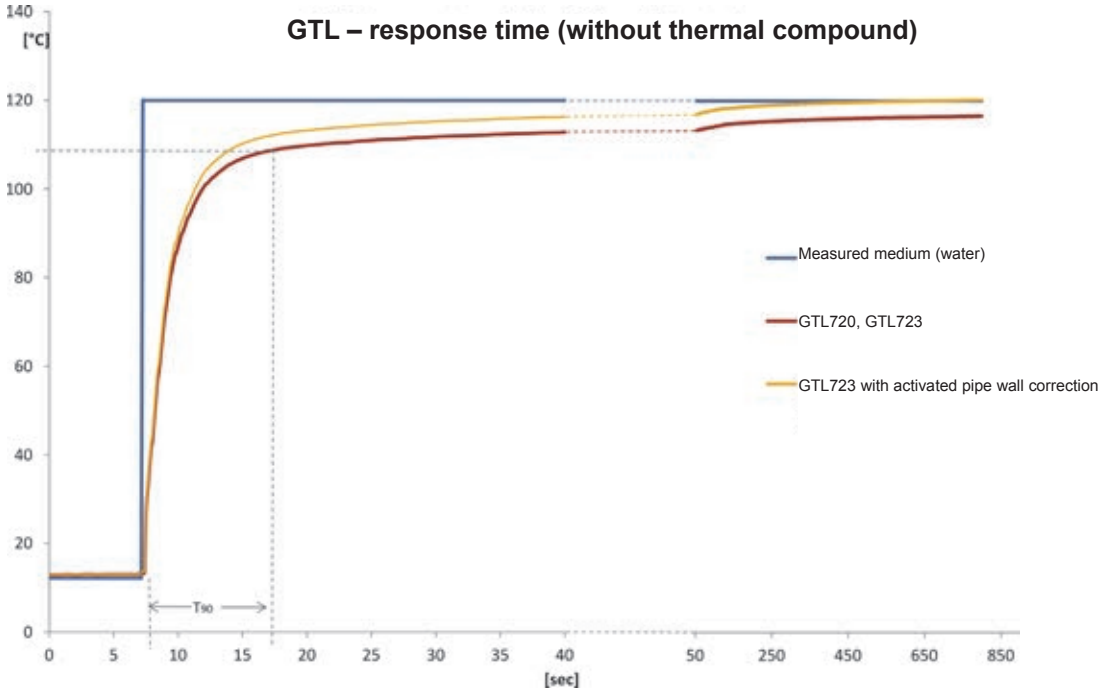
Calibration certificate: on request
For the evaluation of Pt100 signals we recommend our transmitter and temperature displays (PI transmitter, PI displays and PI temperature).

The temperature curves can be seen next page.

Response time at different conditions

Note: measured with SS-type pipe Ø 29 mm, 1.5 mm pipe wall





Clamp-on temperature sensor GTL737

- **Simple mounting via clamp-on adapter**
- **Process connection without media contact**
- **High accuracy even without thermal compound**
- **Fast response time**
- **Replacing/cleaning of the sensor without process interruption**
- **Pt100 sensor with integrated transmitter**
- **Transmitter programmable via GTL Configuration tool or buttons**
- **LCD on-site display, background illumination**
- **Output 4..20 mA, 2-wire connection**

Characteristics

Clamp-on temperature sensor GTL737 is specified to measure temperatures without media contact.
The measuring tip is directly located at the pipe wall and will be fixed by the clamp-on adapter on the pipe. This measuring process provides a high accuracy and a fast response time, which is often better than a measuring principle with media contact.

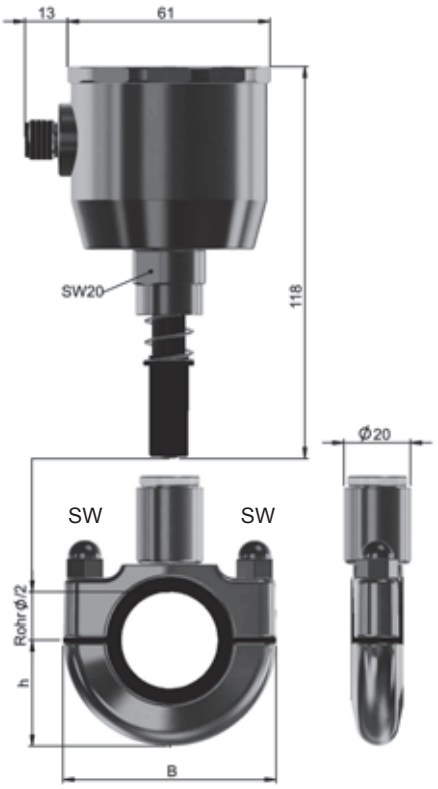
Technical data

Temperature sensor	: Pt100, class A acc. to DIN EN 60751
Measuring range	: -20..+160 °C, programmable, minimal measuring span 50 °C
Working temperature	: -20..+60 °C
Protection class	: IP67 (in connection with mounted M12 plug)
Display	: LCD, 3 ½ -digit, background illuminated
Electrical connection	
Round plug	: 4-pole, M12x1
Supply voltage	: 10..30 V DC, 2-wire connection
Error indication	: programmable
-break of sensor	: I > 22 mA (default setting)
-short circuit	: I < 3.7 mA
Response time/accuracy [1]	
Data without thermal compound, medium temperature 120 °C	
Response time T_{90}	: approx. 10 s
Accuracy	: up to 2.5 % f.s. without pipe wall adjustment
	: up to 0.6 % f.s. with pipe wall adjustment
Data with thermal compound, medium temperature 120 °C	
Response time T_{90}	: ca. 3 s
Accuracy	: up to 1 % f.s. without pipe wall adjustment
	: up to 0.3 % f.s. with pipe wall adjustment
Temperature coefficient	: 0.02 %/°C

[1] Measurement results depending on the mounting situation.
The data are valid for horizontally assembled pipes.

Output	: 4..20 mA
Material	
Sensor	
Spring	: 1.4310
Sensor usage	: PEEK
Sensor tip	: 935er silver
Lid	: 1.4305
M12 plug	: PA/gold plated contacts
Weight	: 500 g
Clamp-on adapter	
Adapter	: 1.4405
Housing	: 1.4305
Adapter insertion	: silicone HTV/PTFE
Weight	
Frame size 1	: not available
Frame size 2	: 170 g
Frame size 3	: 395 g
Frame size 4	: 955 g

Dimensions



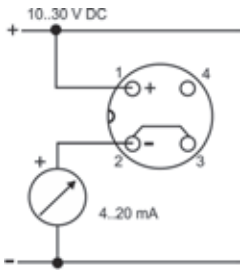
Frame size (Bg)	Pipe Ø [mm]	B [mm]	h [mm]	A/F [mm]
1	not available			
2	20.0..33.9	64	32	11
3	34.0..53.0	92	46	14
4a	60.3..75.9	133	68	14
4b	76.0..88.9	133	68	14

continued on next page

Connection diagram

Supply voltage

Analog output



Ordering code

Note:
In place order please specify the clamp-on sensor and the clamp-on adapter.

Order example:
Transmitter, **GTL** measuring range 0..100 °C
with clamp-on adapter **RLA** for DN32
GTL737-2-M3-00 + RLA424-00

Clamp-on temperature sensor

	1.		2.		3.		4.		5.		6.
GTL		-		-		-		-		-	

1.	**Design / input**	
	737	Pt100 with transmitter and display
2.	**Electric connection**	
	2	2-wire, 4..20 mA, M12 plug
3.	**Transmitter GTL737, default ranges** (programming possible with GTL – Configuration tool via PC)	
	M1	measuring range -10..+40 °C
	M2	measuring range 0..50 °C
	M3	measuring range 0..100 °C
	M4	measuring range 0..150 °C
	MB	transmitter with special measuring range in °C (state special measuring range separately e.g.: 20..130 °C)
4.	**Pipe wall adjustment for SS-type pipes (only GTL737)**	
	0	not active
	1	without thermal compound
	2	with thermal compound
5.	**Options**	
	00	without option
6.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	WZ2.2	factory certification 2.2
	APZ3P	acceptance test certificate 3.1 with 3 measuring points (0°C, 70°C + 1 test point freely selectable)

Clamp-on adapter

	1.		2.
RLA		-	

1.	**Pipe diameter**	
120*)	12,0 mm: DN10	DIN 11850 Reihe 1
130*)	13,0 mm: DN10	DIN 11850 Reihe 2
	12,7 mm: ½“	DIN 11866 Reihe C / ASME-BPE
135*)	13,5 mm: DN8	DIN 11866 Reihe B (ISO 1127)
172*)	17,2 mm: DN10	DIN 11866 Reihe B (ISO 1127)
180*)	18,0 mm: DN15	DIN 11850 Reihe 1
190*)	19,0 mm: DN15	DIN 11850 Reihe 2
	19,0 mm: ¾“	DIN 11866 Reihe C / ASME-BPE
213	21,3 mm: DN15	DIN11866 Reihe B
230	23,0 mm: DN20	DIN11850 Reihe 2
254	25,4 mm: 1 "	DIN11866 Reihe C / ASME-BPE
269	26,9 mm: DN20	DIN11866 Reihe B
280	28,0 mm: DN25	DIN11850 Reihe 1
290	29,0 mm: DN25	DIN11850 Reihe 2
337	33,7 mm: DN25	DIN11866 Reihe B
	34,0 mm: DN32	DIN11850 Reihe 1
350	35,0 mm: DN32	DIN11850 Reihe 2
381	38,1 mm: 1 ½ "	DIN11866 Reihe C / ASME-BPE
400	40,0 mm: DN40	DIN11850 Reihe 1
410	41,0 mm: DN40	DIN11850 Reihe 2
424	42,4 mm: DN32	DIN11866 Reihe B
483	48,3 mm: DN40	DIN11866 Reihe B
508	50,8 mm: 2 "	DIN11866 Reihe C / ASME-BPE
520	52,0 mm: DN50	DIN11850 Reihe 1
530	53,0 mm: DN50	DIN11850 Reihe 2
603	60,3 mm: DN50	DIN11866 Reihe B
635	63,5 mm: 2 ½“	DIN11866 Reihe C / ASME-BPE
700	70,0 mm: DN65	DIN11850 Reihe 2
761	76,1 mm: DN65	DIN11866 Reihe B
	76,2 mm: 3“	DIN11866 Reihe C / ASME-BPE
850	85,0 mm: DN80	DIN11850 Reihe 2
889	88,9 mm: DN80	DIN11866 Reihe B
999	customized diameter on request	
2.	**Options**	
	00	without option

*RLA120-190 nur für GTL720 und GTL723

Accessories:

Thermal compound
Type
WLP10S, containing silicone,
- high thermal conductivity of 10.0 W/mK
- not drying out, silicone parts not fleeting
- storage time up to 12 months at normal ambient conditions, from production date
- syringe containing 3 ml + pipette
- color: silver-gray

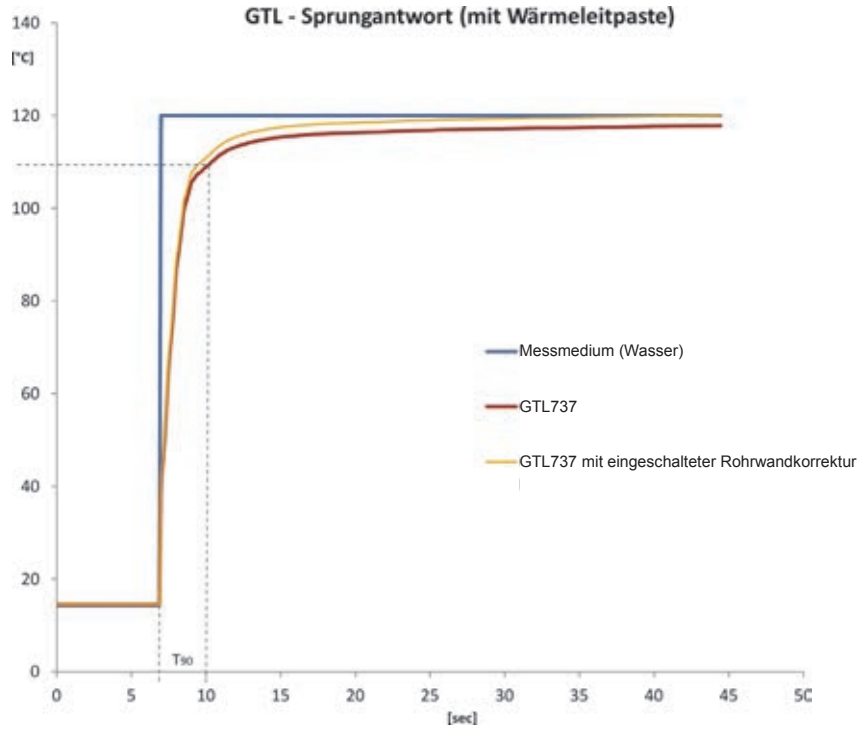
Type:
GTL – Configuration tool
- programming the GTL7xx via PC

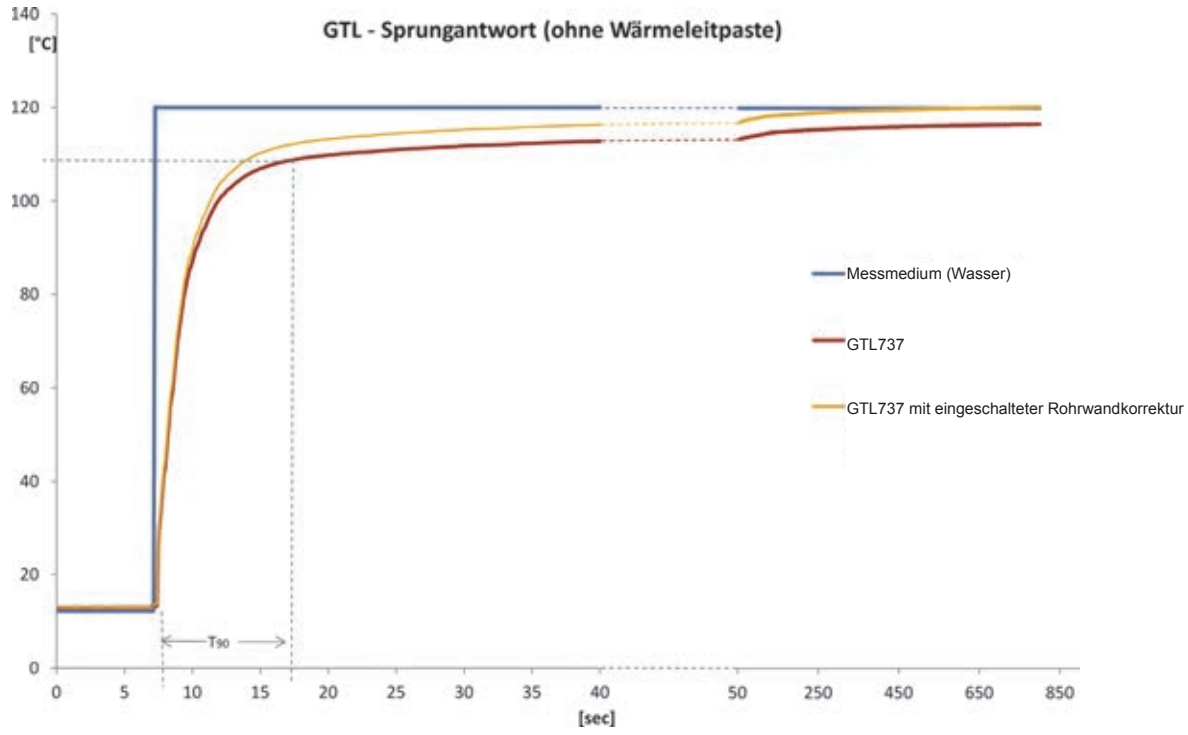
Calibration certificate: on request

The temperature curves can be seen next page.

Response time at different conditions

Note: measured with SS-type pipe Ø 29 mm, 1.5 mm pipe wall





Temperature transmitter HTK12-I / U / F

- **Complete temperature transmitter for food industry in 12 mm housing**
- **Analog output 4..20 mA (HTK12-I)**
- **Analog output 0..10 V (HTK12-U)**
- **Frequency output (HTK12-F)**
- **User-configurable via plug pins (Teach-In)**
- **Identical mechanical design available as temperature switch, flow transmitter/switch or level switch**

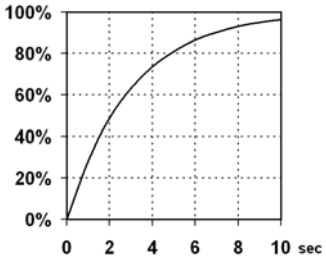
Characteristic

The sensors in the HTK12 family can be used for the measurement and monitoring of temperatures in flowing media, and are specially designed for use in the food industry. The 16-bit processor provides linearization of the PT2000 characteristic curve, and emits the standardized output signal.
The HTK12 electronics transmit the result as

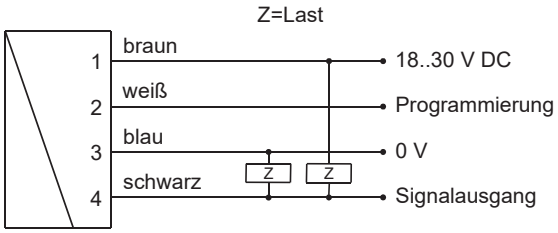
- analog 0/4..20 mA signal (HTK12-I)
- analog 0/2..10 V signal (HTK12-U)
- frequency signal (HTK12-F)

If desired, the range end value can be set to the presently existing temperature using Tech-In (see Handling and Operation).

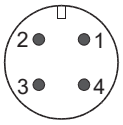
Specifications

Measuring range	standard: 0..100 °C optional: -20..+100 °C or parts of this
Process connection	Sealing cone screw fitting, compatible with G $^1/_2$ GHM*adapt*
Medium temperature	-20..+100 °C
Ambient temperature	0..60 °C
CIP- / SIP temperature	140 °C, < 30 min. max.
Dynamic (τ)	3 sec. 
Process pressure	PN 50
Accuracy	±1 °C
Repeatability	±0.5 °C
Supply voltage	18..30 V DC (controlled)
Current consumption at rest	< 60 mA
Output	HTK12-I: 4..20 mA / max. load 500 Ohm
	HTK12-U: 0..10 V / min load 1 kOhm
	HTK12-F: Frequency output "push-pull" (resistant to short circuits and reversed polarity protected) I_{out} = 100 mA max. selectable output frequency, max. 2 kHz
Protection class	IP 67
Connection	for round plug connector M12x1, 4-pole
Materials in contact with media	sensor tip: 1.4435, FDA compliant
Materials not in contact with media	housing: 1.4571 pressure screw: 1.4404 plug: PA contacts: gold-plated
Weight	approx. 100 g incl. pressure screw
Conformity	CE FDA

Wiring

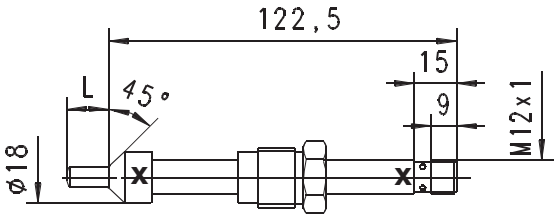


Connection example: PNP NPN



The use of shielded cabling is recommended.

Dimensions



For compatible T-pieces and weld-in sockets of the GHMadapt series, see “Accessories”.

Handhabung und Betrieb

Hinweise

Der Messbereichsendwert kann vom Benutzer per Teach-In programmiert werden. Die Programmierbarkeit muss bei der Bestellung angegeben werden, anderenfalls ist das Gerät nicht programmierbar.

Als komfortable Programmiermöglichkeit per PC für alle Parameter und zur Justierung steht das Interface ECI-3 mit zugehöriger Software zur Verfügung.

Bedienung und Programmierung

Das Messbereichsende ist auf Wunsch per Teach-In durch den Anwender einstellbar.

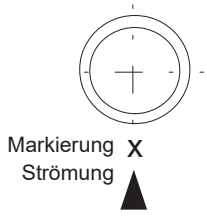
Hierzu ist wie folgt vorzugehen:

- Gerät mit der einzustellenden Temperatur beaufschlagen
- Impuls von mindestens 0,5 s und max. 2 s Dauer an Pin 2 anlegen (z.B. durch Brücke zur Hilfsspannung oder Puls von SPS), um den gemessenen Wert zu übernehmen.
- Nach erfolgtem Teach-In sollte Pin 2 mit 0 V verbunden werden, um versehentliche Programmierung zu verhindern.

Die Geräte besitzen eine gelbe LED, die während des Programmierpulses blinkt. Im Betrieb dient die LED als Betriebsspannungsanzeige.

Montage

Der Fühler wird in die Bohrung mit Dichtkonus eingesteckt, ausgerichtet und mit einer Druckschraube festgezogen.
Bei vorhandener Strömung sollte die Seite des Sensors, die mit einem X markiert ist, angeströmt werden, um eine geringstmögliche Reaktionszeit zu erreichen.



Das Anzugsdrehmoment der Druckschraube soll 5..10 Nm betragen.

Blasen oder Ablagerungen am Sensor sind zu vermeiden! Die beste Einbaulage ergibt sich daher von der Seite.

Bestellschlüssel

	1.	2.	3.	4.	5.
HTK12-		**015**			

Option = ❍

1.	**Analogausgang**	
	I	Stromausgang 4..20 mA
	U	Spannungsausgang 0..10 V
	F	Frequenzausgang
2.	**Fühlerspitzenlänge**	
	015	L = 15 mm
3.	**Programmierung**	
	N	nicht programmierbar (kein Teach-In)
	P ❍	programmierbar (Teach-In möglich)
4.	**Option**	
	H	CIP- / SIP-Version, 140 °C, 30 min. max.
5.	**Zeugnis nach DIN EN 10204 (nur bei Bedarf angeben, Mehrfachnennungen sind möglich)**	
	WZ2.2	Werkszeugnis 2.2
	APZMAT	Abnahmeprüfzeugnis 3.1 für Material (produktberührend)

Optionen

Für HTK12-I und HTK12-U
Sonderbereich Analogausgang:
Messbereichsanfang (4 mA bzw. 0 V) bei ___ °C
Standard = 0 °C
Messbereichsende (20 mA bzw. 10 V) bei ___ °C
Standard = 100 °C

Für HTK12-F
Endfrequenz (max. 2000 Hz) ____ Hz
Standard = 2000 Hz
Sonderbereich Frequenzausgang:
Messbereichsanfang (0 Hz) bei ___ °C
Standard = 0 °C
Messbereichsende (Endfrequenz) bei ___ °C
Standard = 100 °C

Weitere Optionen auf Anfrage!

Zubehör

- Gerätekonfigurator ECI-3 (USB-Programmieradapter)
- Prozess-Adapter
- Rundsteckverbinder / Kabel (KH...)
  Weitere Informationen erhalten Sie im Hauptverzeichnis „Zubehör“

Temperature switch HTK12-S

- **Temperature sensor with limit switch for food industries in 12 mm housing**
- **User-configurable via plug pins (Teach-In)**
- **Identical mechanical design available as temperature transmitter, flow transmitter/switch or level switch**

Characteristic

The sensors of the HTK12 family can be used for measuring and monitoring temperatures in flowing media. They provide multiple configuration options combined with low space requirements. The mechanical construction makes them suitable for use in the foodstuffs industry.

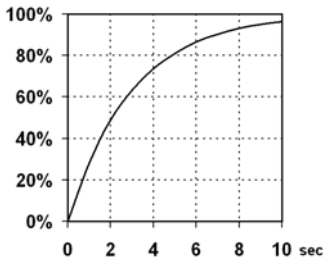
The electronics of the HTK12-S are a flexibly configurable limit switch.

The switching value can be set by the user via teaching (see Handling and operation). All other values have been preset at the factory, but can be modified by the user with the aid of the optionally available ECI-3 interface and a PC.

The adjustable parameters are:

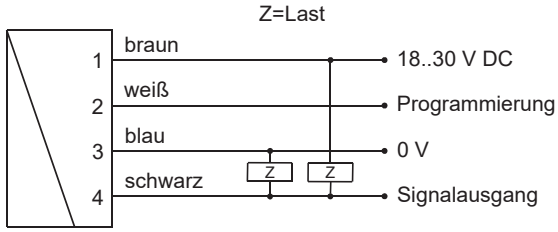
- switching value
- hysteresis
- Min / max monitoring
- Switching delay
- Switchback delay
- Power-On delay
- Teach-Offset

Specifications

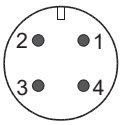
Switching range	-20..+100 °C
Process connection	Sealing cone screw fitting, compatible with G ½ GHM*adapt*
Medium temperature	-20..+100 °C
Ambient temperature	0..60 °C
CIP- / SIP temperature	140 °C, 30 min max.
Dynamic (τ)	3 sec. 
Process pressure	PN 50
Accuracy	±1 °C

Repeatability	±0.5 °C	
Supply voltage	18..30 V DC (controlled)	
Current consumption at rest	< 60 mA	
Switching output	transistor output "Push-Pull" compatible with PNP and NPN, (resistant to short circuits and reversed polarity protected) I_{out} = 100 mA max.	
Protection class	IP 67	
Connection	for round plug connector M12x1, 4-pole	
Materials in contact with media	sensor tip	1.4435, FDA compliant
Materials not in contact with media	housing	1.4571
	pressure screw	1.4404
	plug	PA
	contacts	gold-plated
Weight	approx. 100 g incl. pressure screw	
Conformity	CE FDA	

Wiring

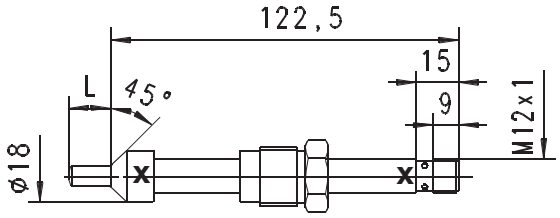


Anschlussbeispiel: PNP NPN



The use of shielded cabling is recommended.

Dimensions



For compatible T-pieces and weld-in sockets of the GHMadapt series, see “Accessories”.

Handling or operation

Operation and programming

If desired, the metering range end can be set by the user by means of Teach-In.
For this, proceed as follows:

- The temperature which is to be set is applied to the device
- Apply a pulse of at least 0.5 seconds and max. 2 seconds duration to pin 2 (e.g. via a bridge to the auxiliary voltage or a pulse from the PLC), in order to accept the measured value
- When the teaching is complete, pin 2 should be connected to 0 V, so as to prevent unintended programming.

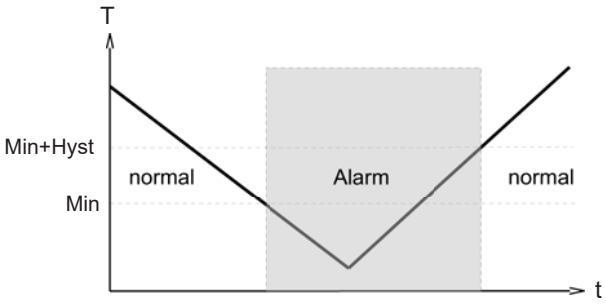
The devices have a yellow LED which flashes during the programming pulse. During operation, the LED acts as a display for the operating voltage.

In order to avoid the need to transit to an undesired operating status during the teach-in, the device can be provided ex-works with a teach-offset. The Teach-In-offset point is added to the currently measured value before saving.

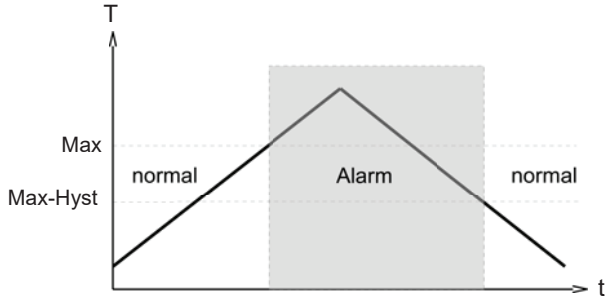
Example: The switching value is to be set to 80 °C, because at this temperature a critical process status is to be notified. However, only 60 °C can be achieved without danger. In this case, the device would be ordered with a "teach-offset" of +20 °C. At 60 °C in the process, a switching value of 80 °C would then be stored during "Teach-In".

The HTK12-S limit switch can be used to monitor minimal or maximal.

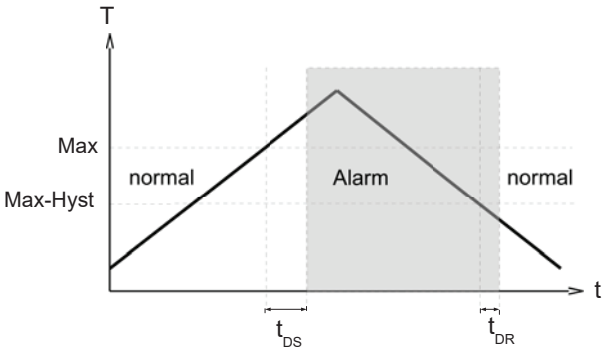
With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is once more exceeded.



With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.

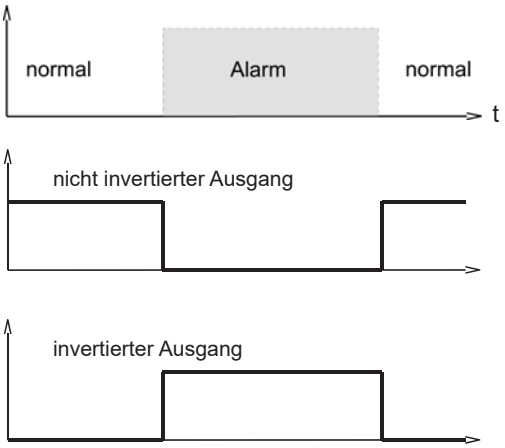


A switchover delay time (t_{DS}) can be applied to the switchover to the alarm state. Equally, one switch-back delay time (t_{DR}) of several can be applied to switching back to the normal state.



In the normal state the integrated LED is on, in the alarm state it is off, and this corresponds to its status when there is no auxiliary voltage.

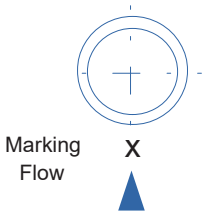
In the non-inverted (standard) model, while in the normal state the switching output is at the level of the auxiliary voltage; in the alarm state it is at 0 V, so that a wire break would also display as an alarm state at the signal receiver. Optionally, an inverted switching output can also be provided, i.e. in the normal state the output is at 0 V, and in the alarm state it is at the level of the supply voltage.



A Power-On-Delay function (ordered as a separate option) makes it possible to maintain the switching output in the normal state for a defined period after application of the supply voltage.

Installation

The sensor is inserted into the boring with a sealing cone, oriented, and fastened in place with a pressure screw.
When a flow is present, this should impinge on the side of the sensor marked with an X, in order to achieve a short response time.



The torque on the pressure screw should be between 5..10 Nm.

Avoid bubbles or deposits on the sensor. It is therefore best to install at the side.

Product key

	1.	2.	3.	4.	5.	6.	7.
HTK12-	**S**	- **015**	-	-	-	- **H**	-

Option = ❍

1.	**Switching output**	
	S	transistor output “push-pull”
2.	**Sensor tip length**	
	015	L = 15 mm
3.	**Programming**	
	N	cannot be programmed (no Teach-In)
	P ❍	programmable(Teach-In possible)
4.	**Functioning of switching output**	
	L	minimum-switch
	H	maximum-switch
5.	**Switching signal**	
	O	non-inverted output
	I ❍	inverted output
6.	**Option**	
	H	CIP- / SIP- version, 140 °C, 30 min. max.
7.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	WZ2.2	factory certification 2.2
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)

Options

Switching delay period (0.0..99.9 s) ___.___ s
(from Normal to Alarm)

Switch-back delay period (0.0..99.9 s) ___.___ s
(from Alarm to Normal)

Power-On-Delay period (0..99 s) ___ s
(Time after power on, during which the outputs are not actuated)

Switching output fixed at ___ °C

Switching hysteresis ___ %
Standard = 2 % of measuring range

Teach-Offset (-100..+100 °C) ___ °C
Standard = 0 °C

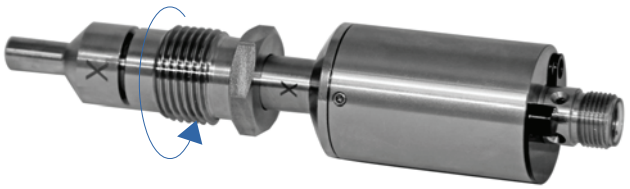
Further options available on request.

Accessories

- Device configurator ECI-3 (USB programming adapter)
- Process adapter
- Round plug connector / cable (KH...)

Further information at “Accessories”

Temperature transmitter / switch HTK30



- **Compact robust temperature switch/transmitter for use in food industry**
- **No moving parts in medium**
- **Only one material in contact with medium**
- **Simple to use**
- **Very low pressure loss**
- **Cable outlet step-less rotatable**
- **Very small installation width, therefore very narrow pipework is possible**

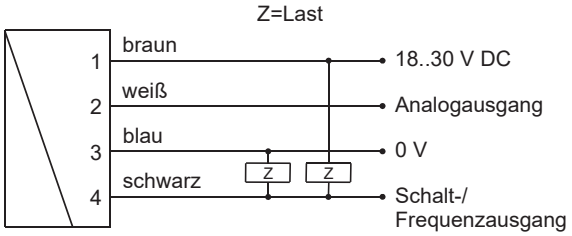
Characteristic

The HTK30 temperature sensor monitors fluid media. Its compact form combines the built-in sensor and the evaluation electronics. The integrated transducer has an analog output (4..20 mA or 0..10 V) and one switching output, which can be configured as a limit switch for monitoring minima or maxima, or as a frequency output. The switching output is designed as a push-pull driver, and can therefore be used both as a PNP or an NPN output. The state of the switching output is signaled with a yellow LED in the switching outlet; the LED has all-round visibility.
The sensor is configured in the factory, or alternatively this can be done with the aid of the optionally available ECI-3 device configurator (USB interface for PC). A selectable parameter can be modified on the device, with the aid of the magnet clip provided. In this case, the current measured value is saved as the parameter value. Examples of these parameters are the switching value or the fullscale value.
The stainless steel electronics housing is rotatable, so it is possible to orient the cable outlet after installation.

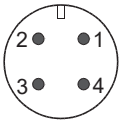
Specifications

Measuring range	0..100 °C, 0..140 °C on request
Accuracy	±1 % FS
Repeatability	±0.1 % FS
Process pressure	PN 50
CIP- / SIP temperature	140 °C, < 30 min. max.
Ambient temperature	-20..+70 °C
Storage temp.	-20..+80 °C
Teach-In / configuration	by means of magnet
Weight	ca. 200 g (standard version)
Supply voltage	24 V DC ± 10%
Current consumption	max. 100 mA
Switching output	transistor output "Push-Pull" (resistant to short circuits and reversed polarity protected) I_{out} = 100 mA max.
Switching hysteresis	2 °C (others available on request)
Display (only with switching output)	yellow LED (on = OK / out = alarm)
Analog output	4..20 mA /load 500 Ohm max. or 0..10 V /load min. 1 kOhm
Connection	for round plug connector M12x1, 4-pole
Materials in contact with media	sensor: 1.4435, FDA compliant
Materials not in contact with media	housing: 1.4305; plug: PA6.6; clip: PA6.6
Protection class	IP 67
Weight	CE, FDA

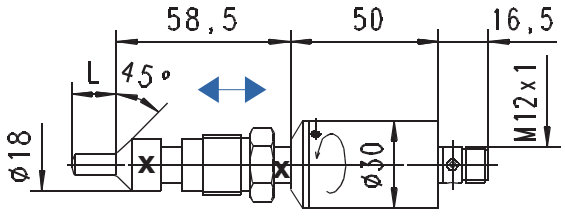
Wiring



Anschlussbeispiel: PNP NPN



Dimensions

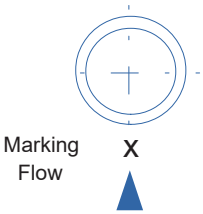


For compatible T-pieces and weld-in sockets of the GHMadapt series, see “Accessories”.

Handling and operation

Installation

The sensor is inserted into the boring with a sealing cone, oriented, and fastened in place with a pressure screw.
When a flow is present, this should impinge on the side of the sensor marked with an X, in order to achieve a short response time.



The torque on the pressure screw should be between 5..10 Nm.

Avoid bubbles or deposits on the sensor. It is therefore best to install at the side.

Programming

The electronics contain a magnetic contact, with the aid of which different parameters can be programmed. Programming takes place when a magnet clip is applied for a period between 0.5 and 2 seconds to the marking located on the label. If the contact time is longer or shorter than this, no programming takes place (protection against external magnetic fields).

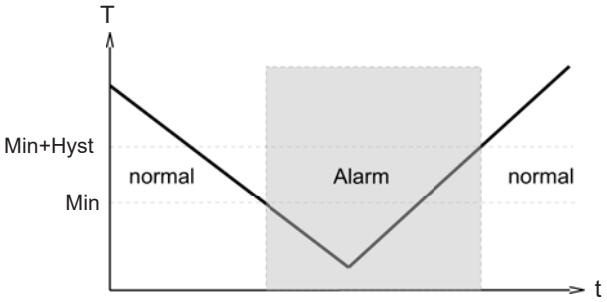
After the programming ("Teach-In"), the clip can either be left on the device, or removed to protect data.
The device has a yellow LED which flashes during the programming pulse. During operation, the LED serves as a status display for the switching output.
In order to avoid the need to transit to an undesired operating status during "teaching", the device can be provided ex-works with a "teach-offset". The "teach-offset" value is added to the currently measured value before saving (or is subtracted if a negative value is entered).

Example: The switching value is to be set to 70 % of the metering range, because at this flow rate a critical process status is to be notified. However, only 50% can be achieved without danger. In this case, the device would be ordered with a "teach-offset" of +20 %. At 50 % in the process, a switching value of 70 % would then be stored during "Teach-In".

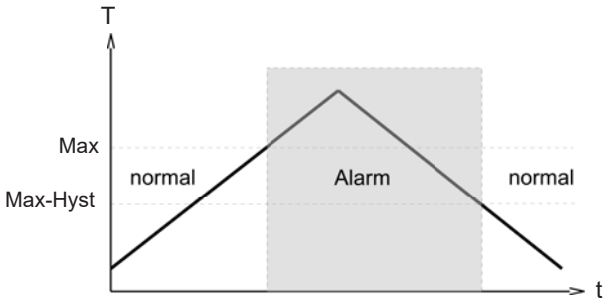
Normally, programming is used to set the limit switch. However, if desired, other parameters such as the end value of the analog or frequency output may also be set.

The limit switch can be used to monitor minima or maxima.

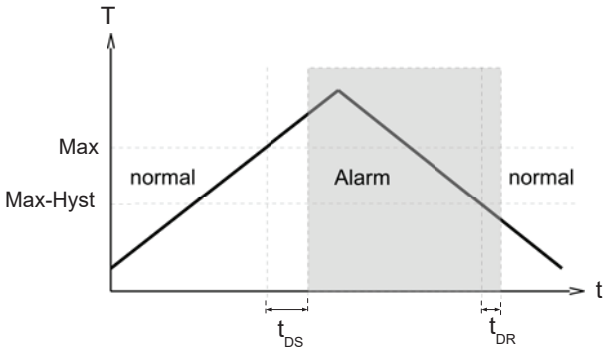
With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is again exceeded.



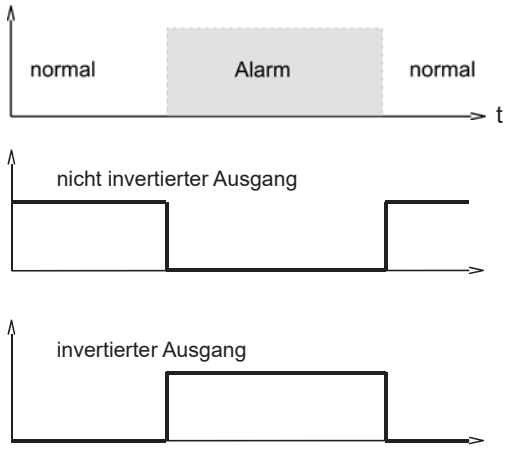
With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



A switchover delay time (t_{DS}) can be applied to the switchover to the alarm state. Equally, one switch-back delay time (t_{DR}) of several can be applied to switching back to the normal state.



In the normal state the integrated LED is on, in the alarm state it is off, and this corresponds to its status when there is no auxiliary voltage.
In the non-inverted (standard) model, while in the normal state the switching output is at the level of the auxiliary voltage; in the alarm state it is at 0 V, so that a wire break would also display as an alarm state at the signal receiver. Optionally, an inverted switching output can also be provided, i.e. in the normal state the output is at 0 V, and in the alarm state it is at the level of the supply voltage.



A Power-On-Delay function (ordered as a separate option) makes it possible to maintain the switching output in the normal state for a defined period after application of the supply voltage.

Product key

	1.	2.	3.	4.	5.	6.	7.
HTK30-	015	K1					

❍ = Option

1.	**Sensor tip length**	
	015	L = 15 mm
2.	**Materials**	
	K1	stainless steel 1.4571
3.	**Analog output**	
	I	current output 4..20 mA
	U	voltage output 0..10 V
	K	no analog output
4.	**Switching output**	
	T	transistor output “push-pull”
	M ❍	NPN (open collector)
	K	no switching output
5.	**Functioning of switching output**	
	L	minimum-switch
	H	maximum-switch
	R	frequency output
	K	no switching output
6.	**Switching signal**	
	O	non-inverted output
	I ❍	inverted output
7.	**Certificate DIN EN 10204 (indicate only when required, multiple responses possible)**	
	WZ2.2	factory certification 2.2
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)

Options

Special measuring range for temperature:

Maximum 140 °C (standard = 100 °C) °C

Minimum -20 °C (standard = 0 °C) °C

Special range for analog output: °C

<= meas. range (standard = meas. range)

Special range for frequency output: °C

<= meas. range (standard = meas. range)

End frequency (max. 2000 Hz) Hz

Switch-on delay (from OK to Alarm) s

Switch-off delay (from OK to Alarm) s

Power-On-Delay period (0..99 s) s

(Time after power on, during which the outputs are not actuated)

Switching output fixed at °C

Special hysteresis °C

For not specified fields the standard settings are selected automatically.

Accessories

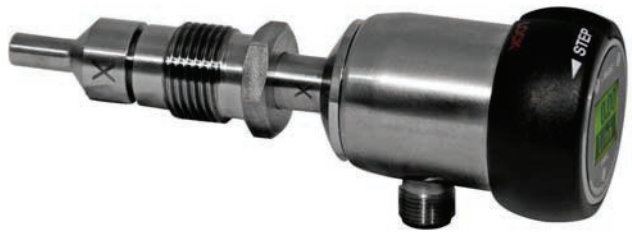
- Device configurator ECI-3 (USB programming adapter)
- Process adapter
- Round plug connector / cable (KH...)

Further information at “Accessories”

Product Information

HTK35

Temperature transmitter / switch HTK35



- **Compact robust temperature transmitter for use in food industry**
- **Only one material in contact with medium**
- **Analog output 4..20 mA or 0..10 V**
- **Two programmable switches (push-pull)**
- **Graphical LCD display, background illuminated (transreflective) can be read in sunlight and in the dark**
- **Programmable parameters via rotatable, removable ring (programming protection)**
- **Full metal housing with non-scratch, chemically resistant glass**
- **Rotatable electronic head for best reading position**
- **Small, compact housing**
- **Simple installation**

Characteristic

The sensors of the HTK35 range can be used for measuring and monitoring temperatures in flowing media, and are specially designed for use in the foodstuffs industry.

The integrated transducer has a backlit graphics LCD display which is very easy to read both in the dark and in bright sunlight. The graphics display allows the presentation of measured values and parameters in a clearly understandable form. The measured values are displayed to 4 places, together with their physical unit, which may also be modified by the user. The electronics have an analog output (4..20 mA or 0..10 V) and two switching outputs, which can be used as limit switches for monitoring minima or maxima, or as two-point controllers. The switching outputs are designed as push-pull drivers, and can therefore be used both as PNP and NPN outputs. Exceeding limit values is signaled by a red LED which is visible over a long distance, and by a clear-text in the display. The stainless steel case has a hardened non-scratch mineral glass pane. It is operated by a programming ring fitted with a magnet, so there is no need to open the operating controls housing, and its leakproofness is permanently ensured.

By turning the ring to right or left, it is simple to modify the parameters (e.g. switching point, hysteresis...). To protect from unintended programming, it can be removed, turned through 180° and replaced, or completely removed, thus acting as a key.

Specifications

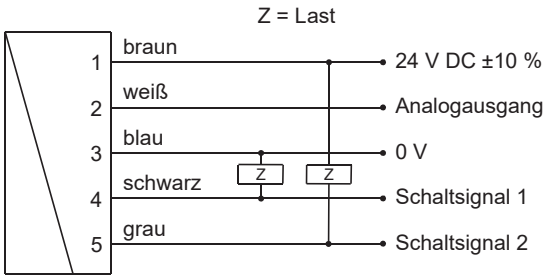
Measuring range	0..100 °C 0..130 °C on request	
Accuracy	±1 % FS	
Repeatability	±0.1 % FS	
Process pressure	PN 50	
Ambient temperature	-20..+70 °C	
Storage temp.	-20..+80 °C	
CIP- / SIP temperature	140 °C, < 30 min. max.	
Supply voltage	24 V DC ± 10%	
Current consumption	< 1 W	
Dynamic (τ)	3 sec.	
Analog output	4..20 mA or 0..10 V	
Switching outputs S1 and S2	transistor output "Push-Pull" compatible with PNP and NPN, (resistant to short circuits and reversed polarity protected) I_{out} = 100 mA max. each output	
Hysteresis	adjustable, position of the hysteresis depends on minimum or maximum switching value	
Display	backlit graphical LCD display (transreflective), extended temperature range -20..+70 °C, 32 x 16 pixels, background illumination, displays value and unit, flashing LED signal lamp with simultaneous message on the display.	
Connection	for round plug connector M12x1, 4-pole	
Protection class	IP 67	
Materials		
medium contact	sensor	1.4435, FDA compliant
electronics housing	housing	stainless steel 1.4305
	glass	mineral glass, hardened
	magnet	Samarium-Cobalt
	ring	POM
Conformity	CE FDA	

HONSBERG
Member of GHM GROUP

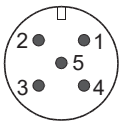
Produktinformation

HTK35

Anschlussbild



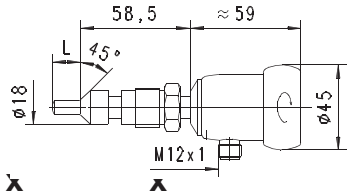
Anschlussbeispiel: PNP NPN



Vor der Elektroinstallation ist sicherzustellen, dass die Hilfsspannung den Datenangaben entspricht.

Die Schaltausgänge sind selbst konfigurierend je nachdem ob sie als PNP- oder NPN-Schalter angeschlossen werden (Push-Pull).
Es wird empfohlen, abgeschirmtes Kabel zu verwenden.

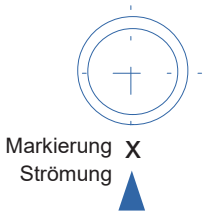
Abmessungen



Handhabung und Betrieb

Montage

Der Fühler wird in die Bohrung mit Dichtkonus eingesteckt, ausgerichtet und mit einer Druckschraube festgezogen.
Bei vorhandener Strömung sollte die Seite des Sensors, die mit einem X markiert ist, angeströmt werden, um eine geringstmögliche Reaktionszeit zu erreichen.



Das Anzugsdrehmoment der Druckschraube soll 5..10 Nm betragen.

Blasen oder Ablagerungen am Sensor sind zu vermeiden. Die beste Einbaulage ergibt sich daher von der Seite.
T-Stücke oder Einschweißstutzen siehe Zubehör.

Programmierung

Der Ringspalt des Programmierrings lässt sich in die Pos. 1 und Pos. 2 auslenken. Folgende Aktionen sind möglich:

Tasten auf 1 = weiter (STEP)
Tasten auf 2 = ändern (PROG)

Ruhelage zwischen 1 und 2

Der Ring ist als Schlüsselsystem abnehmbar oder verdreht wieder aufsteckbar um Programmierschutz zu erhalten.
Die Bedienung erfolgt im Dialog mit den Displaymeldungen, was eine einfache Handhabung sicherstellt.
Wird ausgehend von der Normalanzeige (Momentanmesswert mit Einheit) wiederholt auf 1 (STEP) getastet, so wird die Anzeige nacheinander folgende Informationen anzeigen:

Anzeige der Parameter mit Pos. 1

- Schaltwert S1 (Schaltpunkt 1 in der gewählten Einheit)
- Schaltcharakteristik von S1
  MIN = Minimalwertüberwachung
  MAX = Maximalwertüberwachung
- Hysterese 1 (Hysteresewert von S1 in der eingestellten Einheit)
- Schaltwert S2
- Schaltcharakteristik von S2
- Hysterese 2
- Code
  Nach Eingabe des **Codes 111** können weitere Parameter bestimmt werden:
- Filter (Einschwingzeit von Anzeige und Ausgang)
- Physikalische Einheit (Units)
- Ausgang (Output): 0..20 mA oder 4..20 mA
- 0/4 mA (Messwert, der 0/4 mA entspricht)
- 20 mA (Messwert, der 20 mA entspricht)

Bei Ausführungen mit Spannungsausgang sind 20 mA sinngemäß durch 10 V zu ersetzen.

Ändern (editieren) mit Pos. 2
Wenn der gerade sichtbare Parameter geändert werden soll:

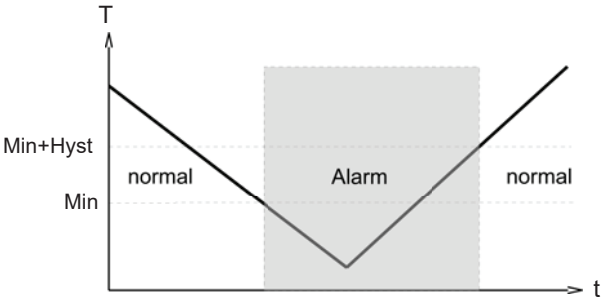
- Ringspalt auf Pos. 2 drehen und es erscheint ein blinkender Cursor, der die änderbare Stelle anzeigt
- Durch wiederholtes Drehen auf Pos. 2 werden die Werte erhöht, durch Drehen auf Pos. 1 wandert der Cursor zur nächsten Stelle
- Verlassen des Parameters durch Drehen auf Pos. 1 (bis Cursor die Zeile verlässt) heißt die Änderung übernehmen
- Ohne Aktion innerhalb 30 s springt das Gerät wieder auf den normalen Anzeigebereich zurück, ohne dass die Änderung übernommen wird

Produktinformation

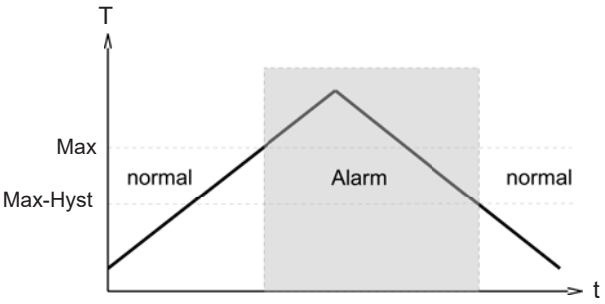
HTK35

Die Grenzwertschalter S1 und S2 können zur Minimum- oder Maximum-Überwachung verwendet werden.

Bei einem Minimum-Schalter führt das Unterschreiten des Grenzwertes zum Umschalten in den Alarmzustand. Die Rückkehr in den Normalzustand erfolgt, wenn der Grenzwert zuzüglich der eingestellten Hysterese wieder überschritten wird.



Bei einem Maximum-Schalter führt das Überschreiten des Grenzwertes zum Umschalten in den Alarmzustand. Die Rückkehr in den Normalzustand erfolgt, wenn der Grenzwert abzüglich der eingestellten Hysterese wieder unterschritten wird.



Das Wechseln in den Alarmzustand wird durch die integrierte rote LED und eine Klarschriftmeldung im Display angezeigt.
Die Schaltausgänge sind im Normalzustand auf Versorgungsspannungspegel, im Alarmzustand auf 0 V, so dass ein Kabelbruch beim Signalempfänger ebenfalls Alarmzustand anzeigt würde.

Überlastanzeige
Überlast eines Schaltausganges wird detektiert, auf dem Display angezeigt (“Check S1 / S2“) und der Schaltausgang wird abgeschaltet.

Simulationsmodus
Zur einfacheren Inbetriebnahme bietet der Sensor einen Simulationsmodus des analogen Ausgangs. Es ist möglich einen programmierbaren Wert im Bereich 0..26,0 mA am Ausgang zu erzeugen (ohne die Prozessgröße zu verändern). Hiermit kann bei der Inbetriebnahme die Strecke zwischen Sensor und nachgeschalteter Elektronik getestet werden. Zu erreichen ist dieser Modus über **Code 311**.

Werkseinstellung
Nach Veränderung der Konfigurationsparameter ist ein Zurückstellen zur Werkseinstellung mit **Code 989** jederzeit möglich.

Bestellschlüssel

	1.		2.		3.		4.		5.
HTK30-	**015**	-	**K1**	-		-	**S**	-	

❍ = Option

1.	**Fühlerspitzenlänge**	
	015	L = 15 mm
2.	**Medienberührter Werkstoff**	
	K1	Edelstahl 1.4435
3.	**Analogausgang**	
	I	4..20 mA
	U ❍	0..10 V
4.	**Elektrischer Anschluss**	
	S	für Rundsteckverbinder M12x1, 5-polig
5.	**Zeugnis nach DIN EN 10204 (nur bei Bedarf angeben, Mehrfachnennungen sind möglich)**	
	WZ2.2	Werkszeugnis 2.2
	APZMAT	Abnahmeprüfzeugnis 3.1 für Material (produktberührend)

Zubehör

- Kabel / Rundsteckverbinder (KB...)
  Weitere Informationen erhalten Sie im Hauptverzeichnis „Zubehör“

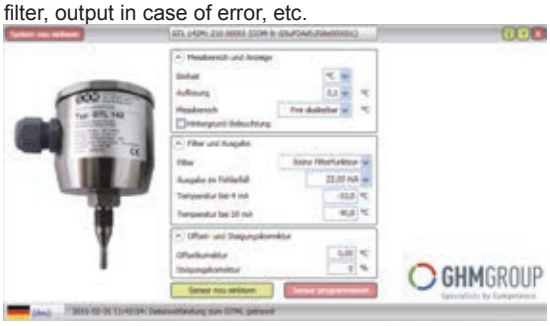
Accessories

GTL - Configuration tool

Suitable for all GTL with integrated transmitter

The programming tool contains:

- **Software GTL - Configurator**
  Setting of unit, resolution, measuring range, filter, output in case of error, etc.



- **GTL - Configuration adapter**
- **Connection cable with M12-plug**
- **Connection cable with loose ends**
- **Connection cable with alligator clips**
- **GKK 252 case**
  with burl foams size: 235 x 185 x 48 mm (W x H x D)
- **Manual**

Device Configurator ECI-1

- **Can be used on site for:**
  - **parameter modification**
  - **firmware update**
  - **adjustment of inputs and outputs**
- **Can be connected via USB**

Characteristics

The device configurator ECI-1 is an interface which allows the connection of microcontroller-managed HONSBERG sensors to the USB port of a computer.
Together with the Windows software "HONSBERG Device Configurator" it enables

- **the modification of all the sensor's configuration settings**
- **the reading of measured values**
- **the adjustment of inputs and outputs**
- **firmware updates**

Technical data

Supply voltage	12..30 V DC (depending on the connected sensor) and via USB
Power consumption	< 1 W
Connection	
Sensor	cable bushing M12x1, 5-pole, straight length approx. 50 cm
Lead	device connector M12x1, 5-pole
USB	USB bushing type B
Operating temperature	0..50 °C
Storage temperature	-20..+80 °C
Dimensions of housing	98 mm (L) x 64 mm (W) x 38 mm (H)
Housing material	ABS
Ingress protection	IP 40

continued on next page

Handling and operation

Connection

Product Information

The device configurator is intended for temporary connection to the application. It is connected between the the existing sensor lead and the sensor. Power supply is via the supply to the sensor and the computer's USB port. When inactive (no communication), the configurator behaves completely neutrally; all signals from the sensor remain available to the application. During communication between computer and sensor, the signal wirings are separated in the configurator, so that in this state the sensor's output signals are not available.

To connect 4-pole leads without a middle hole to the installed 5-pole device connector, adapter K04-05 is included. 4-pole leads with a middle hole can be used without an adapter.

Ordering code

Device configurator (for scope of delivery, see the diagram below)	**ECI-1**

Scope of delivery

1. Device configurator ECI-1
2. USB cable
3. Adapter K04-05
4. Plug KB05G
5. Cable K05PU-02SG
6. Carrying case

Incl. software

Accessories:

Mains connector 24 V DC (with fitted round plug connector, 5-pole, incl. international plug set)		**EPWR24-1**

Replacement parts:

M12x1 adapter 4- / 5-pole	**K04-05**
PUR cable, 5-pole, shielded with round plug connector M12x1	**K05PU-02SG**
Round plug connector M12x1, 5-pole (without cable)	**KB05G**

Temperature s

Welding sleeve for GTL

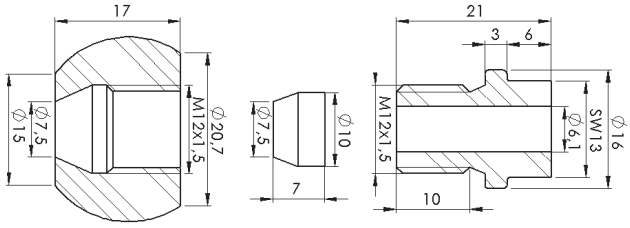
GKEV-25/76

Spherical welding sleeve for inclined mounting consisting of welding sleeve, PEEK clamping ring and clamping screw.

Specifications:

Material	:	V4A (1.4404)
Type of installation	:	PEEK clamping ring, thread M12x1.5
Clamping torque	:	max. 10 Nm
Working pressure	:	max. 10 bar
Application	:	for mounting of temperature probes of series: GTL 349, GTL 369 / M, GTL 389 / M

Design:



Spare parts:
Clamping screw KS-M12
PEEK clamping ring PKR-6

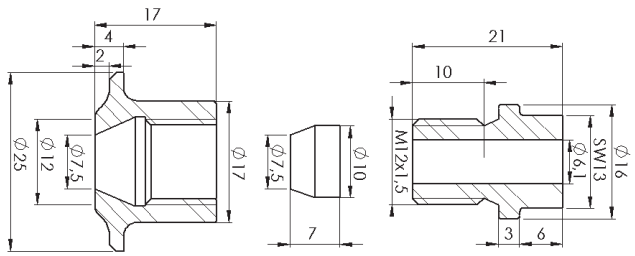
GEMK-25/76

Collar welding sleeve for tanks thick / thin consisting of welding sleeve, PEEK clamping ring and clamping screw.

Specifications

Material	:	V4A (1.4404)
Type of installation	:	PEEK clamping ring, thread M12x1.5
Clamping torque	:	max. 10 Nm
Working pressure	:	max. 10 bar
Application	:	for mounting of temperature probes of series: GTL 349, GTL 369 / M, GTL 389 / M

Design:



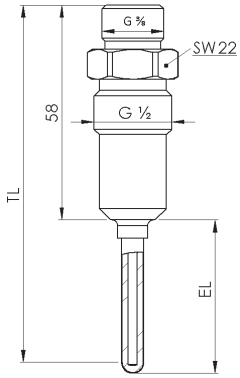
Spare parts:
Clamping screw KS-M12
PEEK clamping ring PKR-6

Product Information

Temperature s

Thermowells for GTL

APHG12



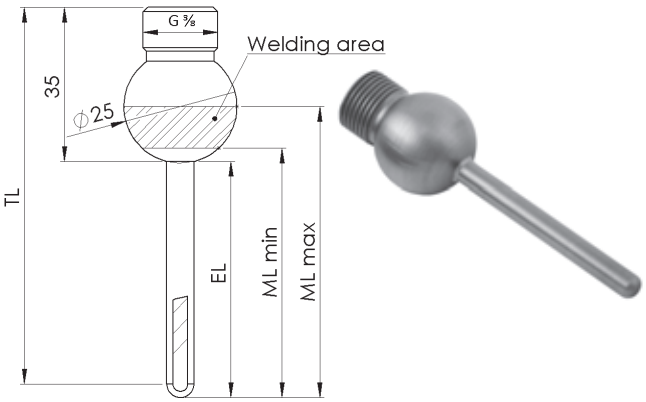
Adapter sleeve, suitable for GHMadapt thread G 1/2" (e.g. APH112) to thread G 3/8".

Product key

	1.	2.	3.	4.
APHG12	-	-	-	-

1.	**Immersion length TL**		
	083	TL = 83 mm	*fitting length EL = 27 mm*
	097	TL = 97 mm	*fitting length EL = 41 mm*
	160	TL = 160 mm	*fitting length EL = 104 mm*
	xxx	any immersion length in mm; min.: 160 mm, max.: 500 mm (e.g. 320 = 320 mm)	
2.	**Options**		
	00	without option	
3.	**Certificate DIN EN 10204 (indicate only when required)**		
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)	
4.	**Surface roughness, only in contact with products. Indicate only when required.**		
	RA08	R_a < 0,8 µm (with acceptance test certificate 3.1 incl. Measurement report)	

APHK25



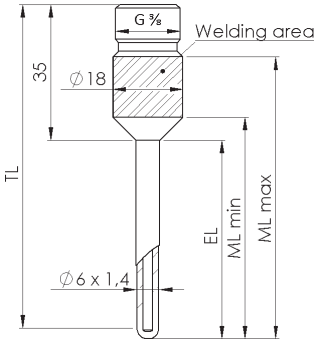
Ball weld-in sleeve to thread G 3/8", for mounting in pipe bends or tanks.

Product key

	1.	2.	3.	4.
APHK25	-	-	-	-

1.	**Immersion length TL**		
	083	TL = 83 mm	*fitting length EL = 50 mm installation length ML: 56..63 mm*
	160	TL = 160 mm	*fitting length EL = 127 mm inst. length ML: 133..140 mm*
	xxx	any immersion length in mm; min.: 160 mm, max.: 500 mm (e.g. 320 = 320 mm)	
2.	**Options**		
	00	without option	
3.	**Certificate DIN EN 10204 (indicate only when required)**		
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)	
4.	**Surface roughness, only in contact with products. Indicate only when required.**		
	RA08	R_a < 0,8 µm (with acceptance test certificate 3.1 incl. Measurement report)	

APHZ18



Cylindric weld-in sleeve to thread G 3/8", for mounting to an existing compression fitting (GKEV-25/76 or GEMK-25/76) or for weld in tubes or tanks.

Product key

	1.	2.	3.	4.
APHZ18	-	-	-	-

1.	**Immersion length TL**		
	083	TL = 83 mm	*fitting length EL = 50 mm installation length ML: 56..71 mm*
	160	TL = 160 mm	*fitting length EL = 127 mm inst. length ML: 133..148 mm*
	xxx	any immersion length in mm; min.: 160 mm, max.: 500 mm (e.g. 320 = 320 mm)	
2.	**Options**		
	00	without option	
3.	**Certificate DIN EN 10204 (indicate only when required)**		
	APZMAT	acceptance test certificate 3.1 for material (in contact with products)	
4.	**Surface roughness, only in contact with products. Indicate only when required.**		
	RA08	R_a < 0,8 µm (with acceptance test certificate 3.1 incl. Measurement report)	

Product Information

Temperature s

Thermal compound

WLP10S

- Syringe containing 3 ml silicone + pipette, color silver-gray
- high thermal conductivity of 10.0 W/mK
- not drying out, silicone parts not fleeting
- Storage time up to 12 months at normal ambient conditions