KROHNE

 7.02278.21.00

GR

Installation and Operating Instructions

TTP 200/300/400

- Variable area flowmeters
- Vortex flowmeters
- Flow controllers
- Electromagnetic flowmeters
- Ultrasonic flowmeters
- Mass flowmeters
- Level measuring instruments
- Communications technology
- Engineering systems & solutions
- Switches, counters, displays and recorders
- Heat metering
- **Pressure and temperature**

Contents

Safety information

Please read this manual carefully, and also take note of country-specific installation standards (e.g. the VDE regulations in Germany) as well as prevailing safety regulations and accidents prevention rules. For safety and warranty reasons, any internal work on the instruments, apart from that involved in normal installation and electrical connection, must be carried out only by qualified KROHNE personnel.

Items includes with supply

- Measuring instrument
- Hygienic adapter
- Installation and operating instructions

Product liability and warranty

Responsibility for suitability and intended use of these instruments rests solely with the operator. Improper installation and operation of the instruments may lead to loss warranty.

In addition, the “General conditions of sale” forming the basis of the purchase contract are applicable.

If instruments need to be returned to KROHNE, please note the information given on the last-but-one page of these instructions.

KROHNE regrets that it cannot repair or check your instruments unless accompanied by a fully completed Service and Repair sheet.

CE / EMC / Standards/ Approvals

The product bears the CE marking on account of compliance with and application of the following standards:

EMCG (89/336/EEC)

EN 50081-1	EN 55022 Class B
EN 61000-6-2	EN 61000-4-2 ESD 4/8 kV
	EN 61000-4-3 HF radiated 10 V/m
	EN 61000-4-4 Burst 4 kV
	EN 61000-4-5 Surge 1 kV sym., 2 kV unsym.
	EN 61000-4-6 HF cable 10 V

1 Installation

1.1 Mechanical installation

- Use only the recommended sleeves or adapters. If other systems are used, no guarantee can be given for proper functioning or leak-tightness.
- Do not use Teflon or paper gaskets for the hygienic process connections featuring a conical seal.
- The tightening torque for the sleeve should be between 10 and 20 Nm.

1.2 Process connections

The hygienic weldable process sleeves are easy to weld into tanks and pipes. The marking points to the centre of the future position of the cable gland or M12 connector. This form of assembly allows installation in conformity with standards of hygiene (to EHEDG, FDA).

Various hygienic adapter sleeves (see Accessories) are available for fitting to other process connections.

- Process connection G1/2“h is the hygienic standard connection with conical seal.
- For installation in small-diameter pipelines it is recommended to use the hygienic M12 system (from DN 15).
- When using a sliding sleeve, please use the threadless variant. The clamp cone forms a hygienic seal with the protective tube.
- A standard G1/2“ connection is available for applications with no hygiene requirements (e.g. cooling water).

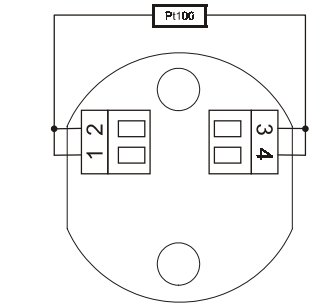
2 Electrical connection

2.1 External signal converter

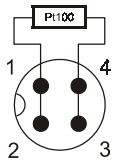
Terminals 1, 2 and 3, 4 are used for connecting up the Pt100 sensor. You can, as required, connect up in 2-, 3- or 4-wire technology.

- The 2-wire connection should not be used when particularly high accuracy is required and where the connecting cables are of longish length.
- When using a 3-wire connection, make sure that all wires have the same cross-sectional area.

The same options are available for the double Pt100, but if connection is made with an M12 connector then only the 2-wire connection may be used.

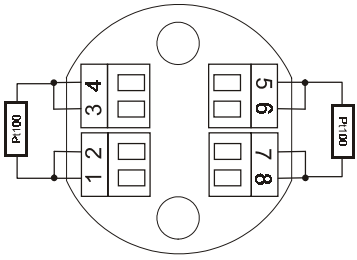


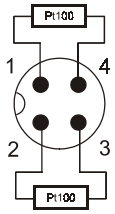
M12



1: braun / brown
2: weiß / white
3: blau / blue
4: schwarz / black

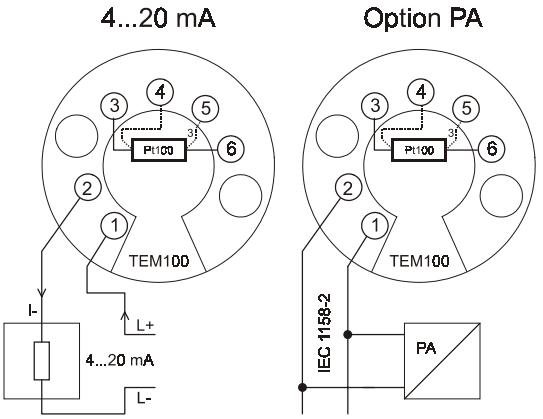
Option D

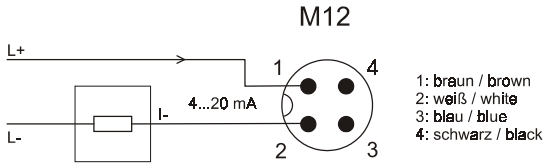




2.2 With integrated signal converter

Terminals 1 and 2 are used for the infeed via a 4...20 mA current loop. As supply voltage, at least 8 V must be available at the module. Do not use any voltage supply higher than 28 V. The pin assignment for the M12 connector is shown in the connection diagram. Please pay regard to the respectively valid wiring regulations.





2.3 Start-up

- Check the leak-tightness at the sleeve.
- Make sure that the cable gland is tight or, as the case may be, the M12 plug connector is properly screwed down.
- After powering the unit, check for correct functioning.

2.4 Operator control

External signal converter
Refer to the directions supplied with the evaluator. Set the measuring range and type of connection at the unit.

With integrated signal converter
You can program the measuring range with the programming adapter, available as an accessory, and the associated PC software. Refer to the operating instructions supplied with the programming adapter.

3 Fault diagnosis and corrective action

In the event of a fault or maloperation, please go through the various faults listed in the table. Do not attempt to disassemble the device.
Should you fail to locate the fault, please contact our Technical Service.

Fault	Cause	Action/elimination
With Pt100 connection		
Incorrect display	Terminal assignment is incorrect	Check terminal assignment
Error display	Cable break	Measure continuity
	Short-circuit	Check wiring
With integrated signal converter		
Incorrect current signal	Supply voltage at module < 8 V	Load impedance too high, voltage too low
	Incorrect measuring range	Correct the programming
No current signal	Cable break	Check continuity of cables
	Supply polarity incorrect	Reverse terminals 1, 2
Current signal > 23 mA	Short-circuit	Check wiring

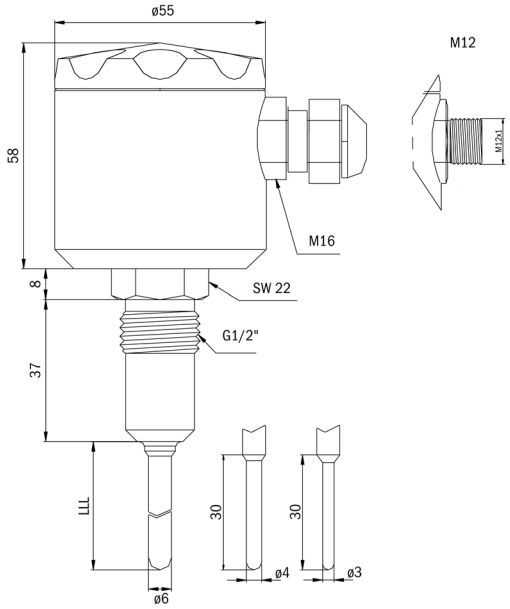
4 Technical data

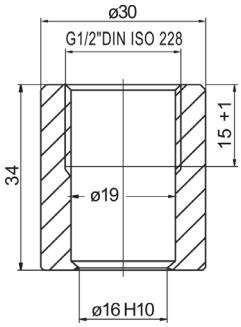
4.1 Technical data

Connection head	Stainless steel V2A 1.4305
Electrical connection	Cable gland M16 (only TTP 200/400)
	M12 connector
Type of protection	IP 67
Ambient temperature	–20...+60 °C
Process connections	Threaded socket G1/2“h; V4A 1.4571
	Threaded socket M12h; V4A 1.4571
	Push-in connection via protective tube dia. 6 mm
	Threaded socket G1/2; V4A 1.4571
Protective tube	Dia. 6 mm x 1 mm; V4A 1.4571
Positioned lengths (mm)	20, 50, 100, 150, 250 (others on request)
Sensor element	Pt100 DIN EN 60751 Cl. A (dual type also possible)
Response time t90	Dia. 6 mm: 7 s; dia. 4 mm: 6 s; dia. 3 mm: 1.5 s
Process temperature range	–20...+170 °C
Operating pressure	Max. 16 bar
With direct Pt100 connection	
Output	Screw terminals for 2-, 3-, 4-wire connection
With integrated head transmitter	
Supply voltage	8...28 V DC (from current loop)
Output	4...20 mA
Accuracy	± 0.1% of full-scale range

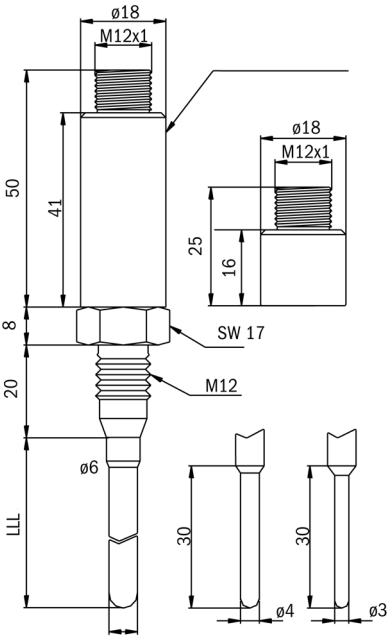
4.2 Dimensions

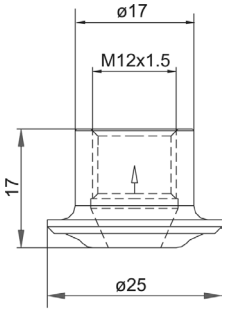
4.2.1 TTP 200





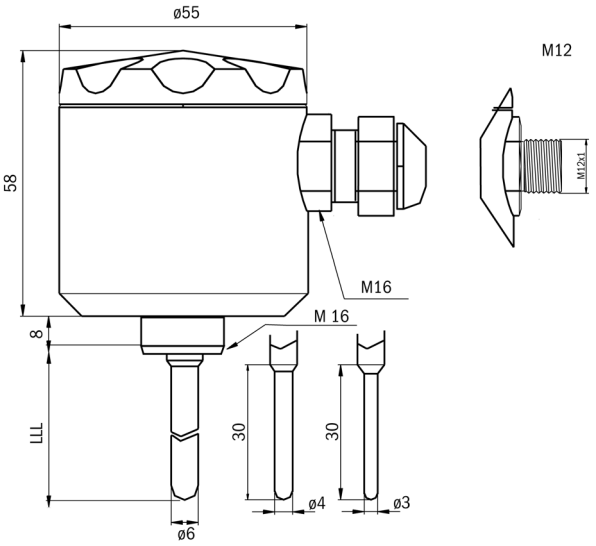
4.2.2 TTP 300





Dimensions in mm

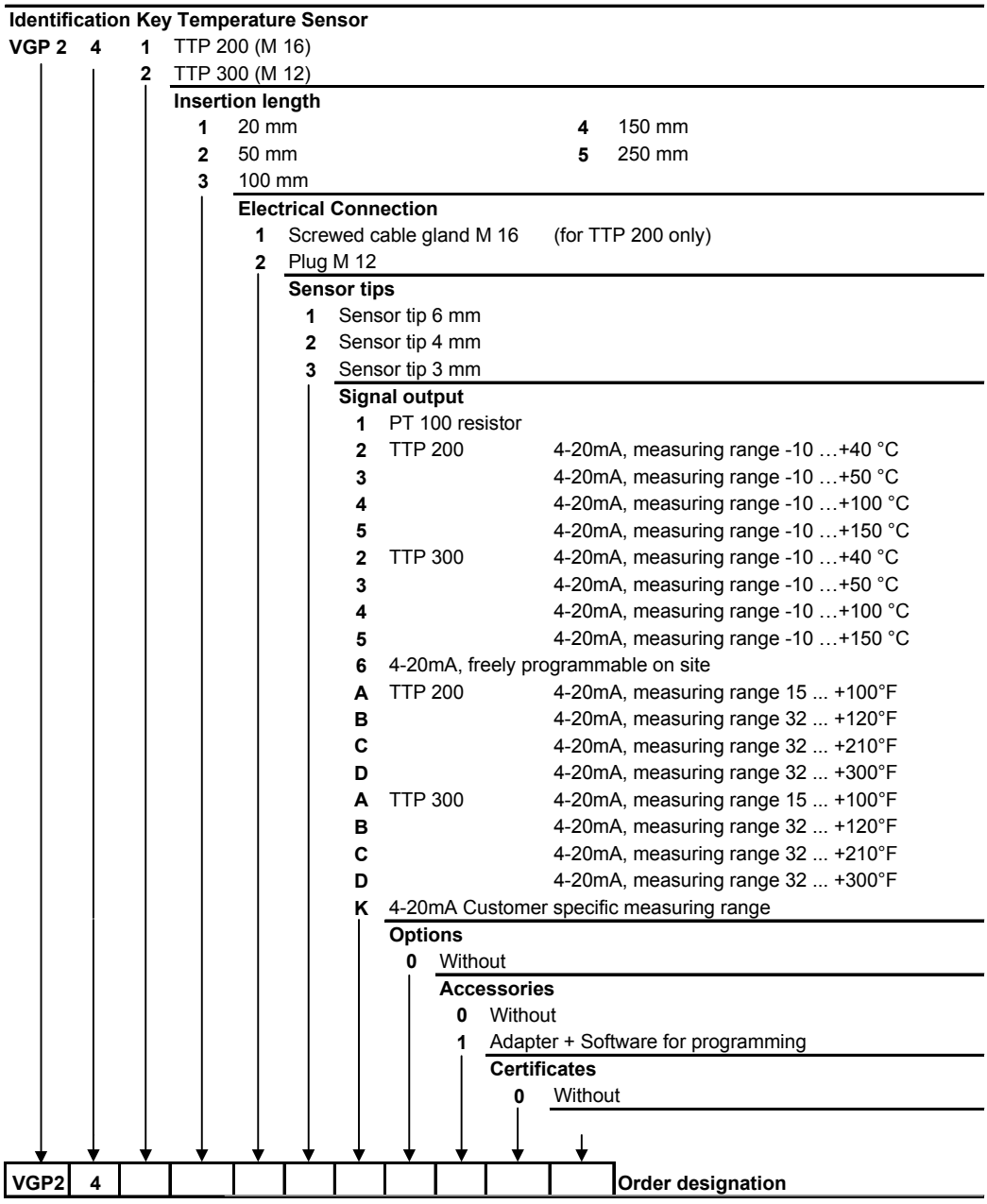
4.2.3 TTP 400



Dimensions in mm

5 Ordering code

5.1 Ordering code



5.2 Spare parts

Should a replaceable part of the sensor be lost or damaged, replacements can be ordered on the basis of the appropriate part number.

Designation	Part No.
Housing lid	KMD.008.055.100
Cable gland M16	KVV.M16.010.008
Connector insert M12, 4-pin	KVV.100.004.000

5.3 Accessories

Designation	Type
System G1/2"h TTP 200	
System G1/2"h TEF 020	HWN 200
Varivent flange version N	HVF 250
Sanitary pipe assembly kit DN 25	HMT 225
Sanitary pipe assembly kit DN 50	HMT 250
Tri-Clamp flange DN 32, DN 40, 2"	HTC 250
Process pipe (T-piece with sleeve)	HWT 2X0 (DN 25 … DN 100)
System M12h TTP 300	
Weldable sleeve, with collar	HWN 310
Varivent flange version N	HVF 350
Sanitary pipe assembly kit DN 25	HMT 325
Sanitary pipe assembly kit DN 50	HMT 350
Tri-Clamp flange DN 32, DN 40, 2"	HTC 350
Process pipe (T-piece with sleeve)	HWT 3X0 (DN 15 … DN 100)
Clamp/screw joint system TTP 400	
Clamp screw adapter	HLC 306

6 Product description

6.1 Applications

The screw-in temperature sensors of the series “with connection head“ are designed to measure the temperature in all processes where high accuracy and ease of handling are what count. The various mounting systems and adapters available enable the optimum choice to be made for your application.

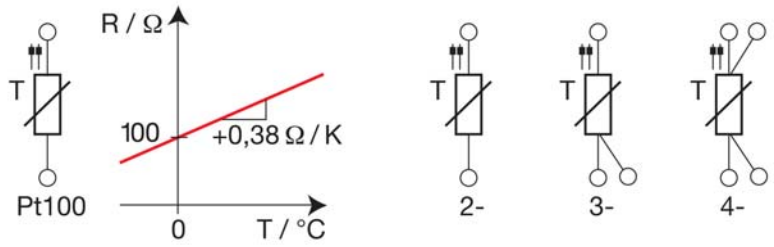
6.2 Functional principle

All temperature sensors of this series feature a Pt100 chip as the sensor element. A platinum meander applied to a ceramic substrate is trimmed such that its electrical resistance at 0°C is exactly 100 ohms. This resistance increases by 0.38 ohm for each 1 Kelvin temperature rise. The exact resistance performance is described in the DIN EN 60751 standard. For our temperature sensors we use without exception the high accuracy class “A“.

6.3 Construction

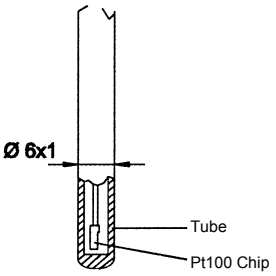
The various weldable process sleeves are made of stainless steel to allow installation in conformity with hygiene requirements. Various evaluation modules are available for evaluation of the Pt100 signal (see Accessories). A signal converter integrated into the stainless steel connection head provides a 4...20-mA standardised signal locally, which can be transmitted noise-free direct to the analogue input of an SPC or PLC. It is also possible to install a transmitter for Profibus PA.
The Pt100 sensor is housed in a rugged 6 mm protective tube of variable length and made of V4A. Due to the special type of thermal coupling, our temperature sensors achieve very fast response times. Tapered sensor tips are also available for even higher requirements.

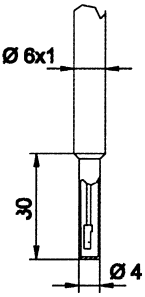
6.3.1 Pt100 resistance performance and wiring methods

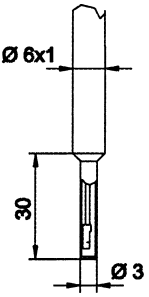


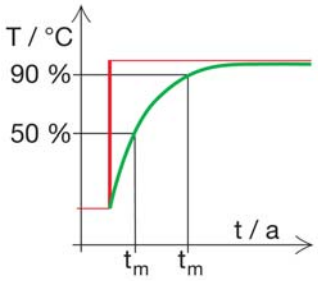
6.3.2 Pt100 tips and response times

Tube 6 mm (S 6)		Tube 4 mm (S 4)		Tube 3 mm (S 3)	
Halftime:	T_{50} < 3.0 sec.	Halftime:	T_{50} < 2.5 sec.	Halftime:	T_{50} < 0.6 sec.
90% - time:	T_{90} < 7.0 sec.	90% - time:	T_{90} < 6.0 sec.	90% - time:	T_{90} < 1.5 sec.









6.4 Features

- Sensors for hygienic installation, no elastomers
- Compact design, optionally with head transmitter
- For direct connection to an SPC or PLC (with integrated head transmitter)
- High accuracy (DIN EN 60751 Class A)
- Very fast response times
- Optimised flow geometry
- Food-compatible materials
- No maintenance requirement
- Installation in pipelines DN 15 and higher
- Defined position of the cable connection
- Hygienic adapter sleeves for other process connections

If you need to return a device for testing or repair to KROHNE

Your instrument has been carefully manufactured and tested. If installed and operated in accordance with these operating instructions, your instrument will rarely present any problems. Should you nevertheless need to return an instrument for checkout or repair, please pay strict attention to the following points:

Due to statutory regulations concerning protection of the environment and safeguarding the health and safety of our personnel, KROHNE may only handle, test and repair returned instruments that have been in contact with liquids if it is possible to do so without risk to personnel and environment.

This means that KROHNE can only service your instrument if it is accompanied by a certificate in line with the following model confirming that the instrument is safe to handle.

If the instrument has been operated with toxic, caustic, flammable or water-endangering liquids, you are kindly requested

- to check and ensure, if necessary by rinsing or neutralizing, that all cavities in the instrument are free from such dangerous substances.
  (Directions on how you can find out whether the primary head has to be opened and then flushed out or neutralized are obtainable from KROHNE on request.)

- to enclose a certificate with the instrument confirming that the instrument is safe to handle and stating the liquid used.

KROHNE regret that they cannot service your instrument unless it is accompanied by such a certificate.

S P E C I M E N certificate

Company: …….. Address: ……

Department: …….. Name: ……

Tel. No.: …….

The enclosed instrument

Type: ……

KROHNE Order No. or Series No ……...

has been operated with the following liquid: ……..

Because this liquid is
water-endangering * / toxic * / caustic * / flammable *
we have
– checked that all cavities in the instrument are free from such substances *
– flushed out and neutralized all cavities in the flowmeter *
(* delete if not applicable)
We confirm that there is **no** risk to man or environment through any residual liquid contained in the instrument.

Date: …….. Signature: ……..

Company stamp: