Level | Pressure | Flow | Temperature | Liquid Analysis | Registration | Systems Components | Services | Solutions

Technical Information

Omnigrad TA20, TA21

Temperature Measuring Technology
Terminal heads for mounting on thermowells of resistance thermometers and thermocouples

Function and system design

All terminal heads can be screwed onto thermowells or extension necks of resistance thermometers and thermocouples. They are used to protect the integrated connection socket or head transmitter.

A wide range of terminal heads for practically all kinds of applications in process measuring technology is available. For offshore or petrochemical plants in hazardous areas or for the food and pharmaceutical industry with stainless steel versions.

All the terminal heads have a cable entry with a seal. The metal E+H terminal heads are fitted with seals for temperatures up to 100 °C (212 °F) . If a head transmitter or a display unit is present, the maximum ambient temperature of the terminal head is restricted by the maximum ambient temperature value of the head transmitter or the display.

A table illustrates the possible combinations of the terminal heads with E+H transmitters. A diagram shows the connection between the process temperature and thermometer length.

Your benefits

- Aluminum, polyamide, polyester, epoxy or stainless steel 316L (1.4404) housing
- Protection class IP55
- iTEMP® head transmitter with mV, Ohm, RTD and TC inputs
- iTEMP® head transmitter for HART, PROFIBUS-PA and PCP communication
- Different electrical connections
- For direct mounting on RTD and TC sensors of the family Omnigrad M

TA20J terminal head:

- Fully programmable loop-powered 4-digit display with °C or °F
- Blind and window version
- Stainless steel 316L (1.4404) material
- Hygienic design, particularly suitable for the food and pharmaceutical industry
- Protection class IP66/IP67
- For wall/pipe field mounting

Endress+Hauser

People for Process Automation

Function and system design

Measuring principle

Omnigrad TA20A, TA20B, TA20D, TA20R, TA20W, TA21E, TA21H:
The terminal heads are housings with a high protection class (IP55) suitable for temperature measurement. All the temperature transmitters of the iTEMP® family TMT18x (analog, HART®, PROFIBUS PA®) can be incorporated in them. The housings can be fitted on top of an Omnigrad M as a terminal head for RTD or TC temperature sensors, or used as a junction housing in a remote application. The TA20R and TA20J terminal heads meet all the hygiene requirements of the food and pharmaceutical industry. Different electrical connections can be supplied: M20x1.5, PROFIBUS PA® plug connector, ½" NPT+ Skintop etc.

Omnigrad TA20J:
The TA20J housing allows local visualization of the current value of the 4 to 20 mA loop current in physical units. The optional 2-wire LCD digital display is usually connected in series with a 2-wire temperature "head-mounted" transmitter and both are installed into the stainless steel housing.
The TA20J is a stainless steel housing (AISI 316L or DIN 1.4404) with a high protection class IP66/IP67, suitable for temperature measurement applications. The TA20J can contain any temperature transmitters of the iTEMP® family TMT18x (analog, HART®, PROFIBUS PA®) and/or a loop-powered 4-digit LCD display. The TA20J housing is available with or without a viewing window and can either be mounted on a pipe with special brackets or fitted on top of an Omnigrad M-type temperature sensor.

TA20J display and user interface

The LCD display uses a "series" connection to the 4 to 20 mA 2-wire loop and is powered through a little voltage drop. By means of 3 keys, it is possible to modify the configuration: zero point and span, decimal places, filter on the reading, measurement resolution and selection of the over-range functionality. With the same 3 keys it is possible to execute the calibration of the A/D converter. All configuration parameters are stored in a nonvolatile EEPROM. The display is mounted in the TA20J stainless steel, window-based housing by means of three screws on the top cover. The loop-powered 4-digit LCD display allows the direct display of the temperature values in engineering units °C or °F. The EMC properties correspond to EN 61000-6-3 and EN 61000-6-2.

TA20J performance data

Reference operating condition	25 °C (77 °F), +/- 5 K
Maximum measured error	0.1% of the programmed range +/-1 digit
Influence of ambient temperature (temperature drift)	100 ppm/°C x measuring range
Input signal	4 to 20 mA
Loop drop out	Max 2.5 V (at 22 mA)
Digits	4 digits 7-segments LCD display
Visible size of the display	33.4 x 13.2 mm (1.31 x 0.52")
Display characteristics	TN positive transreflective, visual angle: h 6:00
Data storage	EEPROM
Storage period	10 years (not powered)
Mounting	3 bores, Ø 3 mm (0.12")

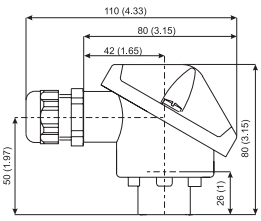
TA20J functions

Parameters	Zero, span, decimal point
Indication limits	-1999 to +9999
Programmable range	Free, within the indication limits
Number of decimal places	0, 1, 2, 3 decimal places
Functions and readings	Filter on measurement readings, over range limits, resolution

Filter on readings	Average on 1 to 8 measurement readings
Update of readings	0.25 to 2 s, according to the filter on readings
Overload limits	3.6 to 22 mA
Resolution	Selectable from 1 to 10 points
Calibration points	Zero (4 mA) and span (20 mA), stored on EEPROM

Mechanical construction and ordering information

TA20A



All dimensions are given in mm (inch)

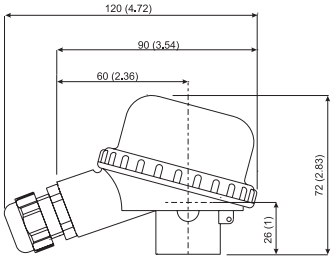
Terminal head to mount a measuring insert with a head transmitter or connection socket. To be mounted on an armature or protective sleeve.

- Dimensions as per DIN 43729, form B (flat face)
- Protection class: IP55/IP68
- Special version IP68 (2 bar 24 h) can be supplied
- Tapped hole spacing: 33 mm (1.30") for the measuring insert
- Max. temperature: 100 °C (212 °F)
- Material: aluminum alloy, rubber seal under the cover
- Cable entry: PG16, G ½", ½" NPT, M12 PA or M20
- Thermowell connection: M24x1.5, ½" NPT or G ½"
- Housing color: blue RAL 5012, epoxy resin coating
- Cap color: gray RAL 7035, epoxy resin coating
- Weight: 180 g (6.35 oz)

Order code

	Thermometer connection				
	A	M24 x 1.5			
	B	1/2" NPT			
	C	G1/2"			
		Electrical connection			
		0	Thread G1/2"		
		1	Gland PG16 gray; IP55		
		2	Gland 1/2" NPT		
		3	Gland PG16 gray; IP68		
		4	Gland PG16 blue; IP68		
		5	Gland M20		
		6	Plug M12 PA		
		7	Gland M20 blue		
			Color		
			A	Housing blue, cap gray	
				Labeling	
				1	Standard E+H
				2	Neutral cover
TA20A-			**A**		**<= order code**

TA20B



All dimensions are given in mm (inch)

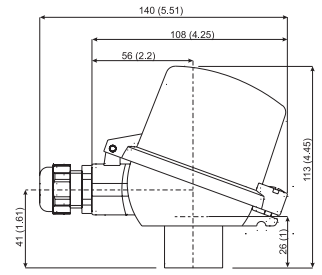
Terminal head to mount a measuring insert with a head transmitter or connection socket. To be mounted on an armature or protective sleeve.

- Dimensions as per DIN 43729, form B (flat face)
- Protection class: IP65
- Tapped hole spacing: 33 mm (1.30") for the measuring insert
- Max. temperature: 80 °C (176 °F)
- Material: polyamide (PA)
- Cable entry: PG11, PG13.5, PG16 or M20
- Thermowell connection M24x1.5
- Color of housing and cap: black
- Weight: 80 g (2.82 oz)

Order code

	Thermometer connection				
	A	M24 x 1.5			
		Electrical connection			
		1	Gland PG16		
		2	Gland M20		
		3	Gland PG13.5		
		4	Gland PG11		
			Color		
			C	Housing black, cap black	
			D	Housing white, cap white	
			E	Housing black, cap blue	
			F	Housing black, cap yellow	
				Labeling	
				1	Standard E+H
TA20B-	**A**			**1**	**<= order code**

TA20D



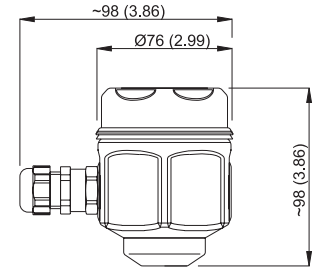
All dimensions are given in mm (inch)

Terminal head to mount a measuring insert with up to two head transmitters or one connection socket and one head transmitter. To be mounted on an armature or protective sleeve.

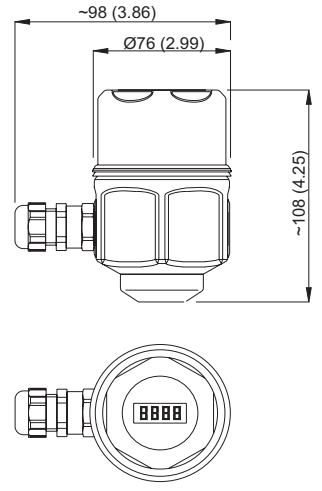
- Dimensions as per DIN 43729, form B (flat face)
- Protection class: IP66
- Special version IP68 (2 bar 24 h) can be supplied
- Tapped hole spacing: 33 mm (1.30") for the measuring insert
- Max. temperature: 100 °C (212 °F)
- Material: aluminum alloy, rubber seal under the cover
- Cable entry: PG11, PG13.5, PG16, ½" NPT, M12 PA or M20
- Thermowell connection: M24x1.5 or ½" NPT
- Two head transmitters can be mounted
- Color of housing and cap: gray
- Weight: 465 g (16.4 oz)

Order code					
	Thermometer connection				
	A	M24 x 1.5			
	B	1/2" NPT			
		Electrical connection			
		1	Gland PG16		
		2	Gland 1/2" NPT		
		3	Gland M20		
		4	Gland PG13.5		
		5	Gland PG11		
		6	Plug M12 PA		
			Color		
			B	Housing blue, cap gray	
			C	Housing blue, cap gray, gland blue	
				Labeling	
				1	Standard E+H
TA20D-				**1**	**<= order code**

TA20J



Version without a display. All dimensions are given in mm (inch)



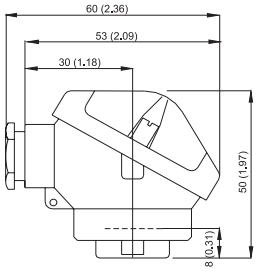
Version with a display. All dimensions are given in mm (inch)

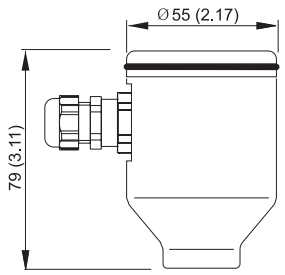
Terminal head to mount a measuring insert with a head transmitter or connection socket. To be mounted on an armature or protective sleeve.

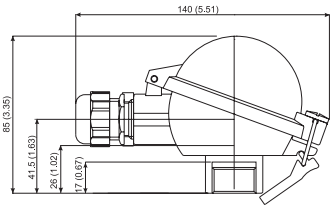
- Dimensions as per DIN 43729, form B (flat face)
- Protection class: IP66/IP67
- Tapped hole spacing: 33 mm (1.30") for the measuring insert
- Material: 316L (1.4404) stainless steel, rubber seal under the cover
- Hygienic design
- For wall/pipe field mount
- Fully programmable loop powered 4-digit display
- Cable entry: ½" NPT, M12 PA, HARTING HAN7D or M20
- Thermowell connection: M24x1.5 or ½" NPT
- Color of housing and cap: silver
- Weight: 650 g (22.93 oz) with a display
- Max. temperature (without a display): 130 °C (266 °F) (depends on the cable gland)
- Ambient temperature (with a display): -20 to 70 °C (-4 to 158 °F)
- Storage temperature (with a display): -30 to 80 °C (-22 to 176 °F)
- Humidity: 25 to 95% not condensating

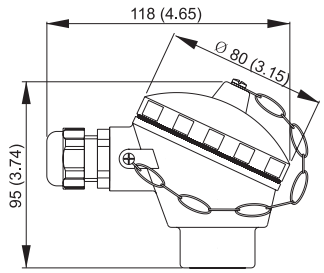
Order code					
	Mounting				
	A	M24 x 1.5			
	B	1/2" NPT			
	P	Bracket, 2" pipe			
	W	Bracket, wall			
		Electrical connection			
		2	Gland 1/2" NPT		
		5	Gland M20		
		6	Plug M12 PA		
		7	Plug HARTING HAN7D		
			Head transmitter		
			A	TMT181-A PCP, w/o display, 2-wire, isolated	
			B	TMT181-A PCP, + display, 2-wire, isolated	
			H	HART TMT182-A, w/o display, 2-wire, isolated	
			J	HART TMT182-A, + display, 2-wire, isolated	
			L	Profibus PA TMT184-A, w/o display	
			V	W/o TMT, + display	
			W	W/o TMT, w/o display	
			1	THT1, separate item, w/o display	
			2	THT1, separate item, + display, TMT	
			3	adapter, w/o display	
				Display	
				0	Not needed
				1	Range 0 to 100°C
				2	Selected range (THT1-)
TA20J-					**<= order code**

THT1- head transmitter integrated in TA20J	Order code			
		Head transmitter		
		A11 TMT180-A11 PCP; 0.2K from..to..°C, span limit -200/650°C A12 TMT180-A12 PCP; 0.1K from..to..°C, span limit -50/250°C A13 Fixed measuring range, TMT180-A21AA, 0.2K, set from 0 to 50 °C A14 Fixed measuring range, TMT180-A21AB, 0.2K, set from 0 to 100 °C A15 Fixed measuring range, TMT180-A21AC, 0.2K, set from 0 to 150 °C A16 Fixed measuring range, TMT180-A21AD, 0.2K, set from 0 to 250 °C A17 Fixed measuring range, TMT180-A22AA, 0.1K, set from 0 to 50 °C A18 Fixed measuring range, TMT180-A22AB, 0.1K, set from 0 to 100 °C A19 Fixed measuring range, TMT180-A22AC, 0.1K, set from 0 to 150 °C A20 Fixed measuring range, TMT180-A22AD, 0.1K, set from 0 to 250 °C A21 TMT180-A21 fix; 0.2K, from..to..°C, span limit -200/650°C A22 TMT180-A22 fix; 0.1K, from..to..°C, span limit -50/250°C F11 TMT181-A, PCP, from...to...°C, 2-wire, isolated F21 TMT181-B, PCP ATEX, from...to...°C, 2-wire, isolated F22 FM TMT181-C; from..to..°C, 2-wire, isolated F23 CSA TMT181-D; from..to..°C, 2-wire, isolated F24 TMT181-E PCP ATEX II3G; from..to..°C, 2-wire, isolated F25 TMT181-F PCP ATEX II3D; from..to..°C, 2-wire, isolated F26 TMT181-G PCP ATEX II1G; from..to..°C, 2-wire, isolated K11 TMT184-A PA K21 TMT184-B PA ATEX K22 TMT184-C PA FM IS K23 TMT184-D PA CSA K24 TMT184-E PA ATEX II3G K25 TMT184-F PA ATEX II3D K26 TMT184-G PA ATEX II1G L11 TMT182-A, HART; from...to...°C, 2-wire, isolated L21 TMT182-B HART ATEX; from...to...°C, 2-wire, isolated L22 TMT182-C HART FM; from...to...°C, 2-wire, isolated L23 TMT182-D HART CSA; from...to...°C, 2-wire, isolated L24 TMT182-E HART ATEX II3G; from...to...°C, 2-wire, isolated L25 TMT182-F HART ATEX II3D; from...to...°C, 2-wire, isolated L26 TMT182-G HART ATEX II1G; from...to...°C, 2-wire, isolated		
			Assembly	
			1 Built-in item...	
	THT1-		**1**	**<= order code**

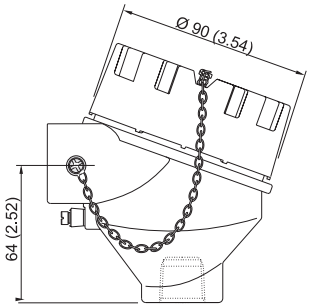
TA20L		Order code
 All dimensions are given in mm (inch)	■ Mignon-type terminal head ■ Protection class: IP55 ■ Epoxy resin coating ■ Max. temperature: 80 °C (176 °F) ■ Material: aluminum alloy, rubber seal under the cover ■ Cable entry: PG9 ■ Thermowell connection: M10x1 ■ Housing color: blue RAL 5012 ■ Cap color: gray RAL 7015 ■ Weight: 75 g (2.65 oz)	Head not available individually, only in conjunction with resistance thermometers TR48, TST410 and TST414 (see "Documentation").

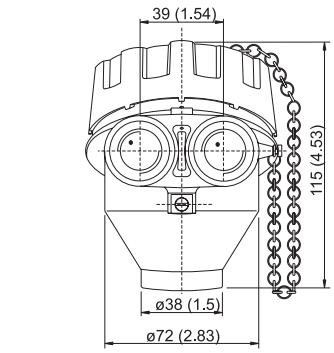
TA20R		Order code					
 All dimensions are given in mm (inch)	Terminal head to mount a measuring insert with a head transmitter or connection socket. To be mounted on an armature or protective sleeve. ■ Dimensions as per DIN 43729, form B (flat face) ■ Protection class: IP66/67 ■ Tapped hole spacing: 33 mm (1.30") for the measuring insert ■ Max. temperature: 100 °C (212 °F) ■ Material: 316L (1.4404) stainless steel ■ Cable entry: PG9, PG11, PG13.5, ½" NPT, M20 or fieldbus device connector ■ Thermowell connection: M24x1.5 or ½" NPT ■ Color of housing and cap: silver ■ Weight: 550 g (19.4 oz)		**Thermometer connection**				
			A	M24 x 1.5		
			B	1/2" NPT		
				Electrical connection		
				2	Cable entry, thread 1/2" NPT	
				3	Gland PG11	
				4	Gland PG13.5	
				5	Cable entry, thread M20 x 1.5	
				6	Gland PG9	
				7	Fieldbus device connector IP66	
					Protection cap	
					A	Protection cap with seal
						Labeling
						1 Standard E+H
		TA20R-			**A**	**1** **<= order code**

TA20W		Order code					
 All dimensions are given in mm (inch)	Terminal head can be opened to mount a measuring insert with a head transmitter or connection socket. To be mounted on an armature or protective sleeve. ■ Dimensions as per DIN 43729, form B (flat face) ■ Protection class: IP66 ■ Tapped hole spacing: 33 mm (1.30") for the measuring insert ■ Max. temperature: 130 °C (266 °F) (depends on the cable gland) ■ Material: aluminum alloy, rubber seal under the cover with a snap ■ Cable entry: PG16 or ½" NPT ■ Thermowell connection: M24x1.5 or ½" NPT ■ Color of housing and cap: gray aluminum ■ Weight: 70 g (2.47 oz)		**Thermometer connection**				
			A	M24 x 1.5		
			B	1/2" NPT		
				Electrical connection		
				A	Gland M20 blue	
				B	Gland PG16 blue	
				1	Gland PG16	
				2	Gland 1/2" NPT	
				3	Gland M20 gray	
					Color	
					B	Housing gray, cap gray
						Labeling
						1 Standard E+H
		TA20W-			**B**	**1** **<= order code**

TA21E		Order code							
 All dimensions are given in mm (inch)	Terminal head with a screw cap to mount a measuring insert with a head transmitter or connection socket. To be mounted on an armature or protective sleeve. ■ Dimensions as per DIN 43729, form B (flat face) ■ Protection grade: IP65 ■ Tapped hole spacing: 33 mm (1.30") for the measuring insert ■ Max. temperature: 130 °C (266 °F) silicone, 100 °C (212 °F) rubber (observe max. permitted temperature of the cable gland!) ■ Material: aluminum alloy with polyester or epoxy coating; rubber or silicone seal under the cover ■ Cable entry: PG11, PG13.5, PG16, M20 or M12 PA plug ■ Thermowell connection: M24x1.5, G1/2" or ½" NPT ■ Housing color: blue ■ Cap color: gray ■ Weight: 300 g (10.58 oz)		**Thermometer connection**						
			A	M24 x 1.5					
			B	1/2" NPT					
			C	G1/2"					
				Electrical connection					
				1	Gland M20				
				2	Gland PG11				
				3	Gland PG13.5				
				4	Gland PG16				
				5	Plug M12 PA				
					Seal				
					A	Silicone (-40 to 130°C) (-40 to 266 °F)			
					B	Oilproof rubber (-40 to 100°C) (-40 to 212 °F)			
						Gland			
						B	Gray		
						C	Blue		
							Coating		
							A	Polyester	
							B	Epoxy	
								Labeling	
								A	Standard E+H
		TA21E-						**A**	**<= order code**

TA21H





All dimensions are given in mm (inch)

The TA21H is compliant with EN 50014/18 and EN 50281-1-1, EN 50281-1-2 standards (EEx-d certification for explosion proof type of protection).
The matching of the housing with the extension below the head and the screw cover ensures a degree of protection from IP66 to IP68. The screw cover is attached to the housing by a chain, which facilitates the use of the device during system maintenance.
The housing is in painted aluminum alloy; it is suitable to contain a transmitter and/or the ceramic block of the insert.

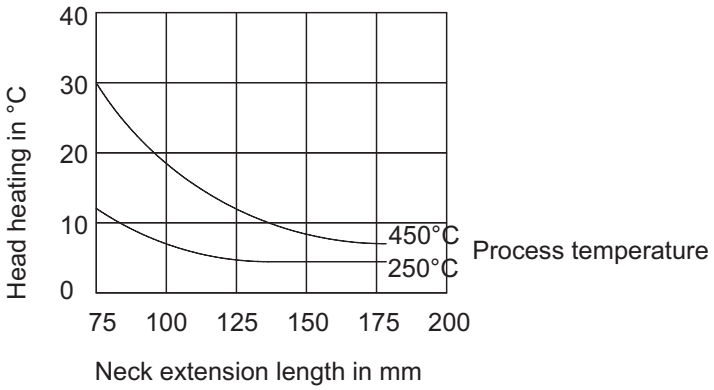
- Dimensions as per DIN 43729, form B (flat face)
- Degree of protection: NEMA 4X, IP66 to IP68
- Tapped hole spacing: 33 mm (1.30") for the measuring insert
- Max. temperature: 100 °C (212 °F)
- Material: aluminum alloy; rubber seal under the cover
- Cable entry: 1/2" NPT, 3/4" NPT, M20 or G1/2"
- Thermowell connection: M24x1.5, G1/2" or ½" NPT
- Housing color: blue
- Cap color: gray
- Weight: 600 g (21.16 oz)

Order code

	Material						
	1	Aluminum					
		Cover type					
		A	Blind cap + seal				
			Mounting				
			1	M24 x 1.5			
			2	1/2" NPT			
			3	G1/2"			
				Electrical connection			
				A	1 x 1/2 NPT		
				B	2x 1/2" NPT		
				C	1x 3/4" NPT		
				D	2x 3/4" NPT		
				E	1x M20 x 1.5		
				F	2x M20 x 1.5		
				G	1x G1/2"		
				H	2x G1/2"		
					Housing		
					1	Blue, gray cap, epoxy coated	
						Labeling	
						A	Standard E+H
TA21H-	**1**	**A**			**1**	**A**	**<= order code**

Temperature increase in terminal head

The following diagram illustrates the increase in temperature (reference values) for two process temperatures in the terminal head over the ambient temperature depending on the length of the thermometer extension neck. Thus, the length of the extension neck must be selected in such a way that the temperature in the head is within the limit values specified in the "Mechanical construction and ordering information" section to prevent the terminal head from overheating.



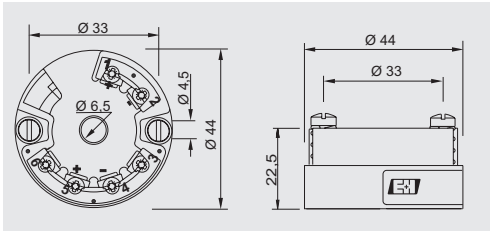
Electronic head transmitter

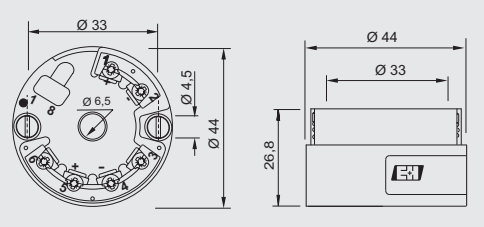
The required type of output signal can be obtained by choosing the correct head mounted transmitter. Endress+Hauser supplies “state-of-the-art” transmitters (the iTEMP® series) built in 2-wire technology and with a 4 to 20 mA output signal, HART® or PROFIBUS-PA®. All the transmitters can be programmed easily at a PC.

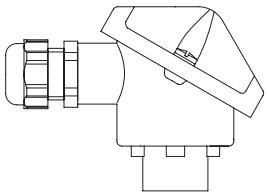
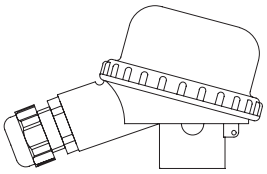
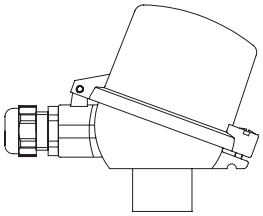
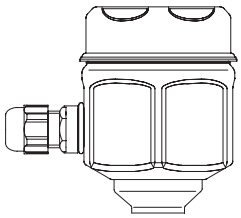
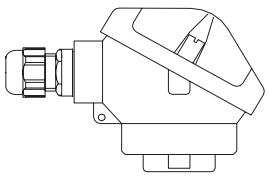
Head transmitter	Communication software
PCP TMT180, TMT181	ReadWin® 2000
HART® TMT182	ReadWin® 2000, COMMUWIN II, FieldCare, handheld module DXR275, DXR375
PROFIBUS-PA® TMT184	FieldCare, COMMUWIN II, Simatic PDM, AMS

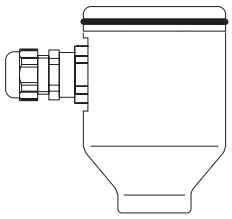
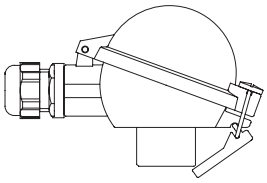
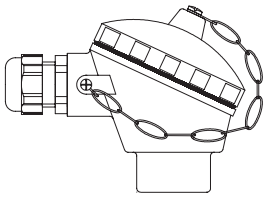
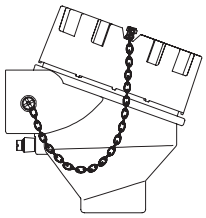
In the case of PROFIBUS-PA® transmitters, E+H recommends the use of PROFIBUS® dedicated connectors. Weidmüller is the type supplied as standard. For detailed information about transmitters, please refer to the relevant documentation (refer to TI codes at the end of the document). If a head transmitter is not deployed, the sensor may be connected to an external transmitter by means of the connection socket (i.e. DIN rail transmitter).

The head-mounted transmitters available are:

Description	Dwg
TMT180: Pt100 input, 4 to 20 mA analog output. Can be programmed at PC. TMT181: mV, Ohm, RTD and TC inputs, returns a 4 to 20 mA and a superimposed HART® signal at the output. Can be programmed at PC. TMT187: Pt100 input, 4 to 20 mA analog output. Fixed, preconfigured measuring range (must be specified by the user when ordering). TMT188: TC input, 4 to 20 mA analog output. Fixed, preconfigured measuring range (must be specified by the user when ordering).	

Description	Dwg
TMT184: mV, Ohm, RTD and TC inputs, digital PROFIBUS-PA® output signal. The communication address can be set via software or via a mechanical dip-switch.	

Terminal heads	Suitable head transmitters
TA20A 	■ TMT180 iTEMP Pt100 ■ TMT181 iTEMP PCP (mV, Ohm, RTD, TC) ■ TMT182 iTEMP HART (mV, Ohm, RTD, TC) ■ TMT184 iTEMP PROFIBUS-PA (mV, Ohm, RTD, TC) ■ TMT187 iTEMP Pt100 ■ TMT188 iTEMP TC (See "Documentation")
TA20B 	■ TMT180 iTEMP Pt100 ■ TMT181 iTEMP PCP (mV, Ohm, RTD, TC) ■ TMT182 iTEMP HART (mV, Ohm, RTD, TC) ■ TMT184 iTEMP PROFIBUS-PA (mV, Ohm, RTD, TC) ■ TMT187 iTEMP Pt100 ■ TMT188 iTEMP TC (See "Documentation")
TA20D 	■ TMT180 iTEMP Pt100 ■ TMT181 iTEMP PCP (mV, Ohm, RTD, TC) ■ TMT182 iTEMP HART (mV, Ohm, RTD, TC) ■ TMT184 iTEMP PROFIBUS-PA (mV, Ohm, RTD, TC) ■ TMT187 iTEMP Pt100 ■ TMT188 iTEMP TC (See "Documentation")
TA20J 	■ TMT180 iTEMP Pt100 ■ TMT181 iTEMP PCP (mV, Ohm, RTD, TC) ■ TMT182 iTEMP HART (mV, Ohm, RTD, TC) ■ TMT184 iTEMP PROFIBUS-PA (mV, Ohm, RTD, TC) ■ TMT187 iTEMP Pt100 ■ TMT188 iTEMP TC (See "Documentation")
TA20L 	Head only available in conjunction with resistance thermometers TR48, TST410 and TST414.

Terminal heads	Suitable head transmitters
TA20R 	■ TMT180 iTEMP Pt100 ■ TMT181 iTEMP PCP (mV, Ohm, RTD, TC) ■ TMT182 iTEMP HART (mV, Ohm, RTD, TC) ■ TMT184 iTEMP PROFIBUS-PA (mV, Ohm, RTD, TC) ■ TMT187 iTEMP Pt100 ■ TMT188 iTEMP TC (See "Documentation")
TA20W 	■ TMT180 iTEMP Pt100 ■ TMT181 iTEMP PCP (mV, Ohm, RTD, TC) ■ TMT182 iTEMP HART (mV, Ohm, RTD, TC) ■ TMT184 iTEMP PROFIBUS-PA (mV, Ohm, RTD, TC) ■ TMT187 iTEMP Pt100 ■ TMT188 iTEMP TC (See "Documentation")
TA21E 	■ TMT180 iTEMP Pt100 ■ TMT181 iTEMP PCP (mV, Ohm, RTD, TC) ■ TMT182 iTEMP HART (mV, Ohm, RTD, TC) ■ TMT184 iTEMP PROFIBUS-PA (mV, Ohm, RTD, TC) ■ TMT187 iTEMP Pt100 ■ TMT188 iTEMP TC (See "Documentation")
TA21H 	■ TMT180 iTEMP Pt100 ■ TMT181 iTEMP PCP (mV, Ohm, RTD, TC) ■ TMT182 iTEMP HART (mV, Ohm, RTD, TC) ■ TMT184 iTEMP PROFIBUS-PA (mV, Ohm, RTD, TC) ■ TMT187 iTEMP Pt100 ■ TMT188 iTEMP TC (See "Documentation")

Supplementary documentation

- Brochure on temperature measuring technology: FA006T09en
- Operating Instructions for TA20J terminal head: BA225R09a3

Temperature head transmitter:
- Technical Information: TI088R09en, iTEMP TMT180 Pt100
- Technical Information: TI070R09en, iTEMP TMT181 PCP (mV, Ohm, RTD, TC)
- Technical Information: TI078R09en, iTEMP TMT182 HART (mV, Ohm, RTD, TC)
- Technical Information: TI079R09en, iTEMP TMT184 PROFIBUS-PA (mV, Ohm, RTD, TC)
- Technical Information: TI076R09en, iTEMP TMT187 Pt100
- Technical Information: TI077R09en, iTEMP TMT188 TC

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