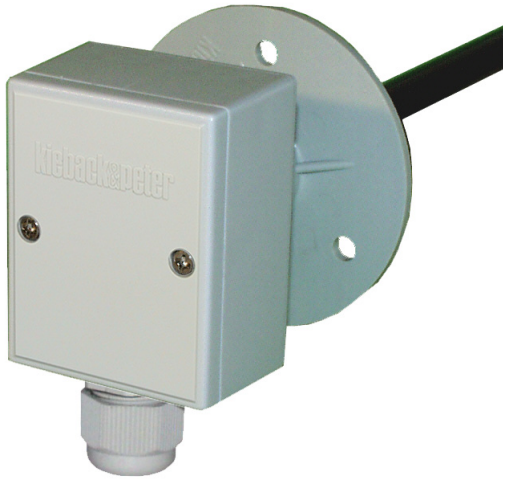
TLH2, TLH3, TLH4
Duct humidity/temperature sensors



Application

With its two separate measuring systems, the combined TLHx allow for continuous detection of the relative humidity and temperature control in ventilation and air conditioning systems.

The sensors are used in conjunction with all loop controllers and control systems that have an analog 0 to 10 V input and sensor connection for the KP10 active measuring element.

Content

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Important Information Regarding Product Safety

Safety Instructions

This data sheet contains information on installing and commissioning the product "TLH2, TLH3, TLH4". Each person who carries out work on this product must have read and understood this data sheet. If you have any questions that are not resolved by this data sheet, you can obtain further information from the supplier or manufacturer.

If the product is not used in accordance with this data sheet, the protection provided will be impaired.

Applicable regulations must be observed when installing and using the device. Within the EU, these include regulations regarding occupational safety and accident prevention as well as those from the VDE (Association for Electrical, Electronic & Information Technologies). If the device is used in other countries, it is the responsibility of the system installer or operator to comply with local regulations.

Mounting, installation and commissioning work on the devices may only be carried out by qualified technicians. Qualified technicians are persons who are familiar with the described product and who can assess given tasks and recognize possible dangers due to technical training, knowledge and experience as well as knowledge of the appropriate regulations.

Legend

WARNING

Indicates a hazard of medium risk which can result in death or severe bodily injury if it is not avoided.

CAUTION

Indicates a hazard of low risk which can result in minor or medium bodily injury if it is not avoided.

NOTICE

Indicates a hazard of medium risk which can result in material damage or malfunctions if it is not avoided.

NOTE

Indicates additional information that can simplify the work with the product for you.

Notes on Disposal

For disposal, the product is considered waste from electrical and electronic equipment (electronic waste) and must not be disposed of as household waste. Special treatment for specific components may be legally binding or ecologically sensible. The local and currently applicable legislation must be observed.

Item

TLH2	Duct humidity/temperature sensor Support tube is 200 mm long (installation length 180 mm)
TLH3	Duct humidity/temperature sensor Support tube is 300 mm long (installation length 280 mm)
TLH4	Duct humidity/temperature sensor Support tube is 400 mm long (installation length 380 mm)

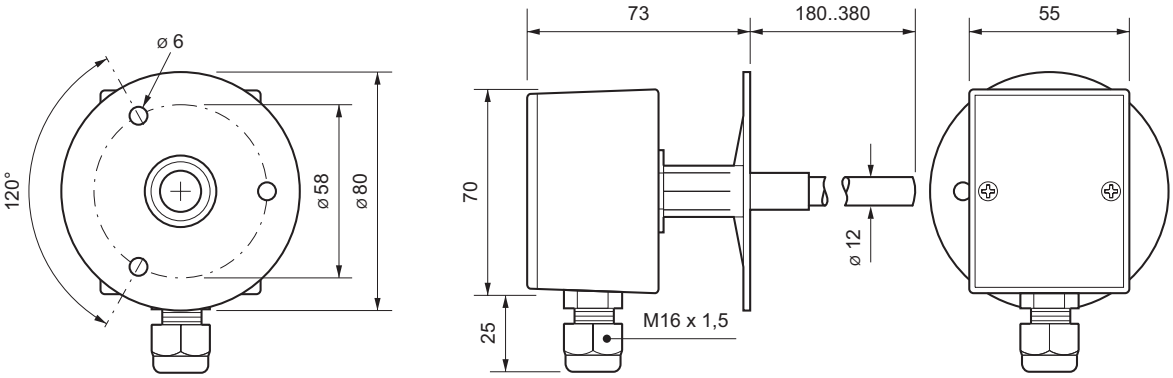
Technical Data

Nominal voltage	AC 24 V ± 10 %, 0.5 VA	
Measured value	rel. humidity	Humidity sensor with converter Output: 0 to 10 V DC; max. 5 mA for 0 to 100 % r. h.
	Temperature	KP10 active measuring element Output: 2.731 V at 0 °C, TC = 10 mV/K
Measuring tolerance	rel. humidity	±3 % r. h.
	Temperature	Typically ±0.2 K
Time constant	rel. humidity	Change in humidity at the same temperature: T = 15 s If the temperature changes: T = 190 s (Values both at an air velocity of 2 m/s)
	Temperature	T = 35 s
Measuring range	rel. humidity	0 % to100 % r.h.
	Temperature	-40 C to +80°C
Connection	Screw terminals, max. 1.5 mm²	
Housing	Light gray plastic housing, cable entry M16 x 1.5	
Degree of protection	IP65	
Ambient temperature	-40 C to +80°C	
Ambient humidity	0 to 90% r.h.; non-condensing	

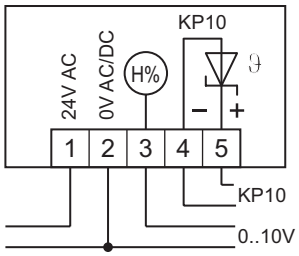
Accessories (not included in delivery)

B3	Socket flange for variable installation depth

Dimensions



Connection

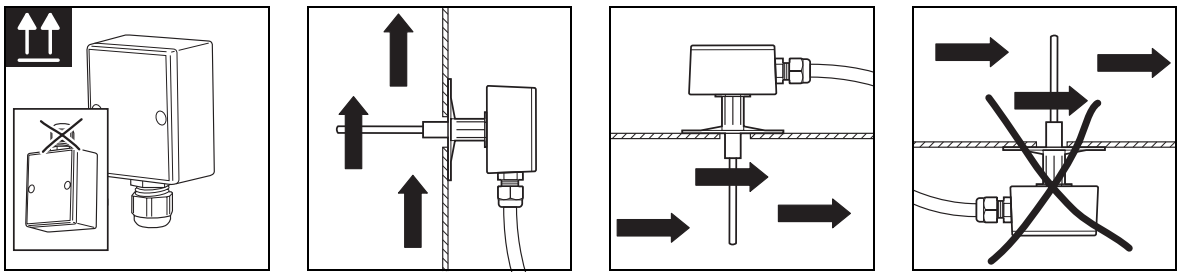


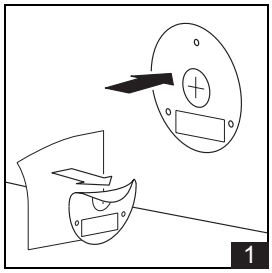
Mounting

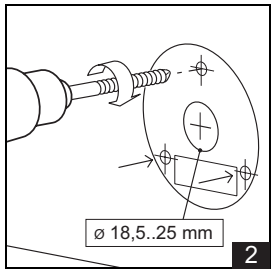
CAUTION

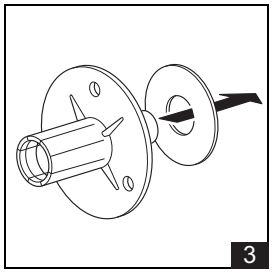
Mounting/demounting may only be carried out by qualified technicians when the power is switched off.

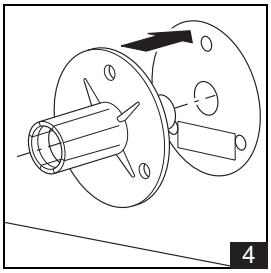
Only mount in the specified mounting position.

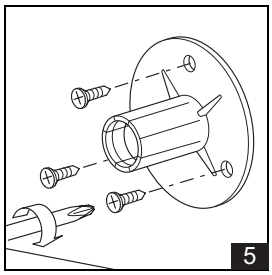


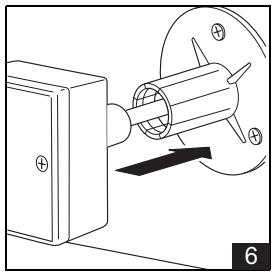












- Affix the drill stencil to the ventilation duct and drill the mounting holes.
- Screw the socket flange (with gasket) tightly onto the ventilation duct.
- The duct temperature sensor is supplied with a self-adhesive drill stencil for the socket flange for easy mounting. The stencil has an information block for position detection.
- Insert the duct temperature sensor into the socket flange until it locks into place.
- Be sure to leave enough space to connect the device.

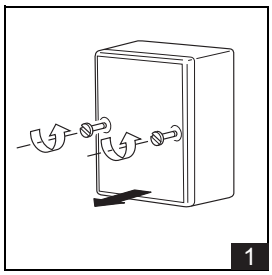
The sensor is uninstalled in reverse order.

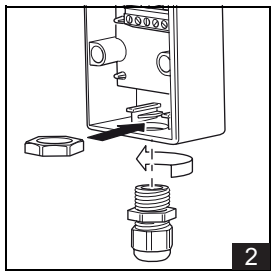
Installation

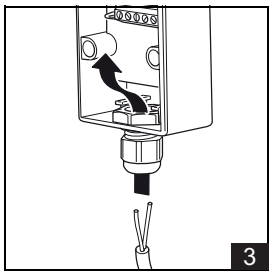
CAUTION

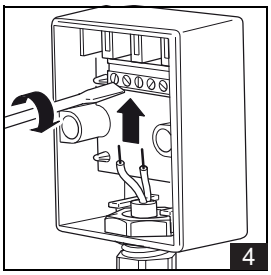
Electrical installation for connecting the device may only be carried out by qualified technicians.

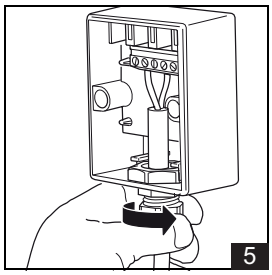
Ensure that this process complies with guidelines from the VDE (Association for Electrical, Electronic & Information Technologies) and local wiring regulations.

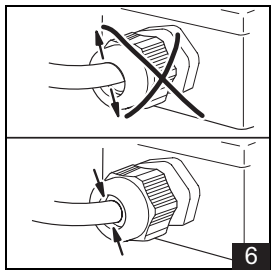


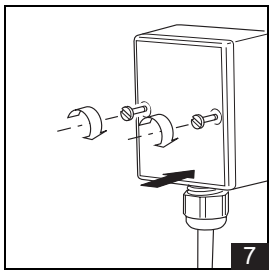












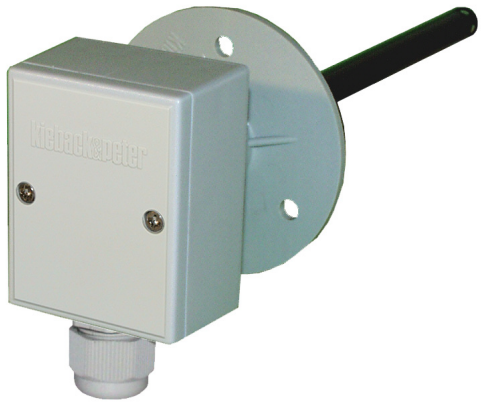
Temperature/voltage table

Temperature/Resistance Table for KP10 Measuring Element

T (C)	U (V)	T (C)	U (V)	T (C)	U (V)	T (C)	U (V)
-40	**2.33**	**-10**	**2.63**	**20**	**2.93**	**50**	**3.23**
-39	2.34	-9	2.64	21	2.94	51	3.24
-38	2.35	-8	2.65	22	2.95	52	3.25
-37	2.36	-7	2.66	23	2.96	53	3.26
-36	2.37	-6	2.67	24	2.97	54	3.27
-35	2.38	-5	2.68	25	2.98	55	3.28
-34	2.39	-4	2.69	26	2.99	56	3.29
-33	2.40	-3	2.70	27	3.00	57	3.30
-32	2.41	-2	2.71	28	3.01	58	3.31
-31	2.42	-1	2.72	29	3.02	59	3.32
-30	**2.43**	**0**	**2.73**	**30**	**3.03**	**60**	**3.33**
-29	2.44	1	2.74	31	3.04	61	3.34
-28	2.45	2	2.75	32	3.05	62	3.35
-27	2.46	3	2.76	33	3.06	63	3.36
-26	2.47	4	2.77	34	3.07	64	3.37
-25	2.48	5	2.78	35	3.08	65	3.38
-24	2.49	6	2.79	36	3.09	66	3.39
-23	2.50	7	2.80	37	3.10	67	3.40
-22	2.51	8	2.81	38	3.11	68	3.41
-21	2.52	9	2.82	39	3.12	69	3.42
-20	**2.53**	**10**	**2.83**	**40**	**3.13**	**70**	**3.43**
-19	2.54	11	2.84	41	3.14	71	3.44
-18	2.55	12	2.85	42	3.15	72	3.45
-17	2.56	13	2.86	43	3.16	73	3.46
-16	2.57	14	2.87	44	3.17	74	3.47
-15	2.58	15	2.88	45	3.18	75	3.48
-14	2.59	16	2.89	46	3.19	76	3.49
-13	2.60	17	2.90	47	3.20	77	3.50
-12	2.61	18	2.91	48	3.21	78	3.51
-11	2.62	19	2.92	49	3.22	79	3.52
-10	**2.63**	**20**	**2.93**	**50**	**3.23**	**80**	**3.53**

TLD1, TLD2, TLD3 and TLD4 Duct Temperature Sensors

Application



TLDx duct temperature sensors are used as controlled variable sensors for duct installation in all outside-temperature controlled or fixed-value controlled ventilation and air conditioning systems. They can also be used for closed-loop room temperature control in industrial spaces and workshops.

The duct temperature sensors are used in conjunction with all loop controllers and control systems that have a sensor connection for the KP10 measuring element.

Content

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Notes on Disposal

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Item

TLD1	Duct temperature sensor with KP10 measuring system, thermowell for measuring element is 100 mm long, duct installation depth is 80 mm
TLD2	Duct temperature sensor with KP10 measuring system, thermowell for measuring element is 200 mm long, duct installation depth is 180 mm
TLD3	Duct temperature sensor with KP10 measuring system, thermowell for measuring element is 300 mm long, duct installation depth is 280 mm
TLD4	Duct temperature sensor with KP10 measuring system, thermowell for measuring element is 400 mm long, duct installation depth is 380 mm

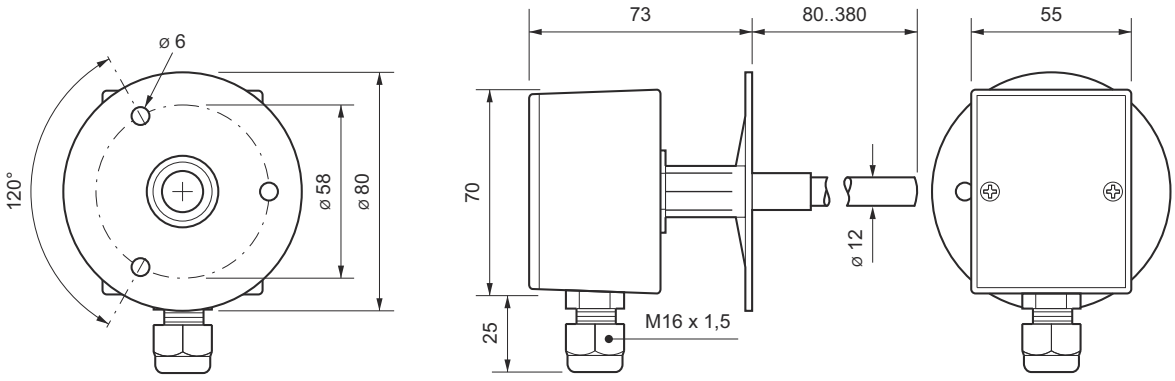
Technical Data

Function	Temperature voltage transmitter
Measured quantity	Temperature
Measuring element	Active measuring element KP10Output: 2.731 V at 0 °C, TC = 10 mV/K
Measuring tolerance	Typically ±0.2K
Time constant	T = 35 s at 2 m/s air velocity
Measuring range	Minimum temperature = -40 C/Maximum temperature = +120 C
Ambient temp. Sensor	-40 °C..+120 °C
Ambient temperature	-40 °C..+80°C
Ambient humidity	0 % to 95 % relative humidity, not permanently condensing
Connection	Screw terminals, max. 1.5 mm²
Connection housing	Light gray plastic housing, cable entry M16 x 1.5
Degree of protection	IP65

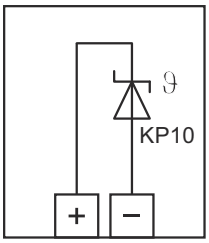
Accessories (not included in delivery)

B3	Socket flange for variable installation depth
Z21	Wall bracket for temperature sensor

Dimensions

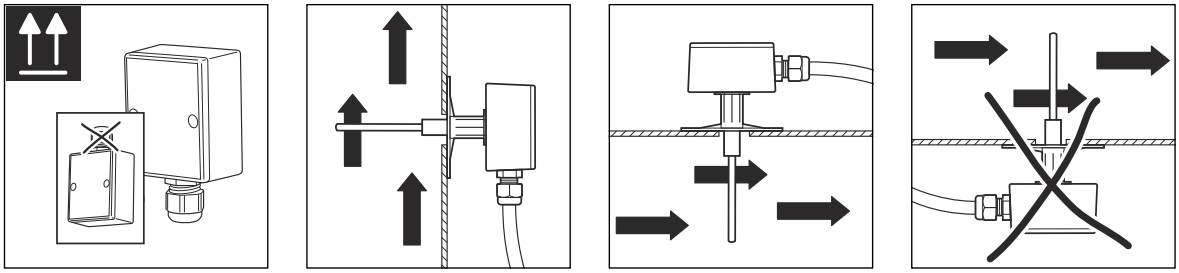


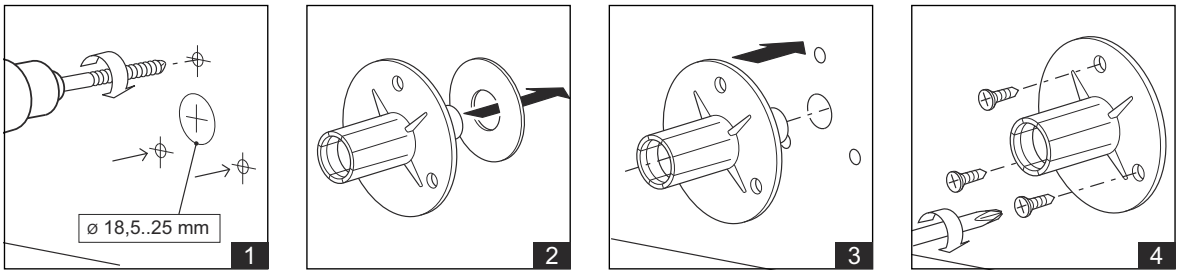
Connection

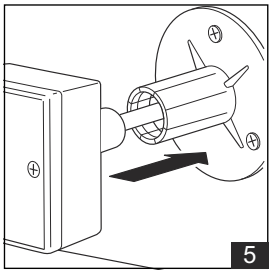


Mounting

Comply with the specified mounting position.







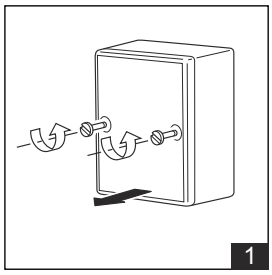
- Screw the socket flange (with gasket) tightly onto the ventilation duct.
- Insert the duct temperature sensor into the socket flange until it locks into place.
- Be sure to leave enough space to connect the device.

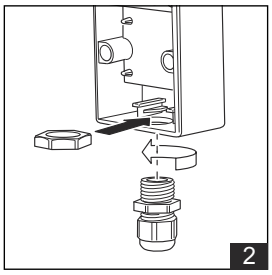
Installation

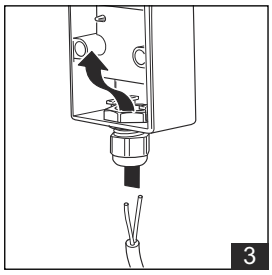
CAUTION

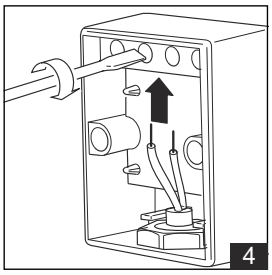
Electrical installation for connecting the device may only be carried out by qualified technicians.

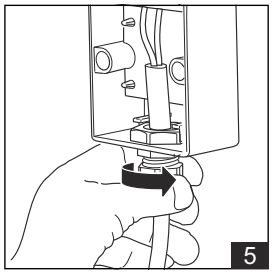
Ensure that this process complies with guidelines from the VDE (Association for Electrical, Electronic & Information Technologies) and local wiring regulations.

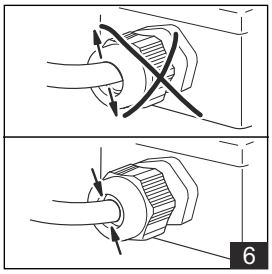


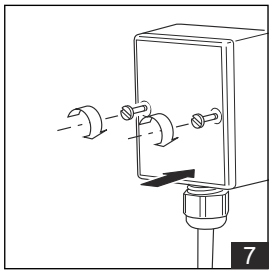












Temperature/voltage table for measuring element KP10, temperature range -40 °C..120 °C

T (°C)	U (V DC)	T (°C)	U (V DC)	T °(C)	U (V DC)	T (°C)	U (V DC)	T (°C)	U (V DC)
-40	**2,33**	**-5**	**2,68**	**30**	**3,03**	**65**	**3,38**	**100**	**3,73**
-39	2,34	-4	2,69	31	3,04	66	3,39	101	3,74
-38	2,35	-3	2,70	32	3,05	67	3,40	102	3,75
-37	2,36	-2	2,71	33	3,06	68	3,41	103	3,76
-36	2,37	-1	2,72	34	3,07	69	3,42	104	3,77
-35	**2,38**	**0**	**2,73**	**35**	**3,08**	**70**	**3,43**	**105**	**3,78**
-34	2,39	1	2,74	36	3,09	71	3,44	106	3,79
-33	2,40	2	2,75	37	3,10	72	3,45	107	3,80
-32	2,41	3	2,76	38	3,11	73	3,46	108	3,81
-31	2,42	4	2,77	39	3,12	74	3,47	109	3,82
-30	**2,43**	**5**	**2,78**	**40**	**3,13**	**75**	**3,48**	**110**	**3,83**
-29	2,44	6	2,79	41	3,14	76	3,49	111	3,84
-28	2,45	7	2,80	42	3,15	77	3,50	112	3,85
-27	2,46	8	2,81	43	3,16	78	3,51	113	3,86
-26	2,47	9	2,82	44	3,17	79	3,52	114	3,87
-25	**2,48**	**10**	**2,83**	**45**	**3,18**	**80**	**3,53**	**115**	**3,88**
-24	2,49	11	2,84	46	3,19	81	3,54	116	3,89
-23	2,50	12	2,85	47	3,20	82	3,55	117	3,90
-22	2,51	13	2,86	48	3,21	83	3,56	118	3,91
-21	2,52	14	2,87	49	3,22	84	3,57	119	3,92
-20	**2,53**	**15**	**2,88**	**50**	**3,23**	**85**	**3,58**	**120**	**3,93**
-19	2,54	16	2,89	51	3,24	86	3,59		
-18	2,55	17	2,90	52	3,25	87	3,60		
-17	2,56	18	2,91	53	3,26	88	3,61		
-16	2,57	19	2,92	54	3,27	89	3,62		
-15	**2,58**	**20**	**2,93**	**55**	**3,28**	**90**	**3,63**		
-14	2,59	21	2,94	56	3,29	91	3,64		
-13	2,60	22	2,95	57	3,30	92	3,65		
-12	2,61	23	2,96	58	3,31	93	3,66		
-11	2,62	24	2,97	59	3,32	94	3,67		
-10	**2,63**	**25**	**2,98**	**60**	**3,33**	**95**	**3,68**		
-9	2,64	26	2,99	61	3,34	96	3,69		
-8	2,65	27	3,00	62	3,35	97	3,70		
-7	2,66	28	3,01	63	3,36	98	3,71		
-6	2,67	29	3,02	64	3,37	99	3,72		
-5	**2,68**	**30**	**3,03**	**65**	**3,38**	**100**	**3,73**		

TVD Immersion Temperature Sensors

Application

The TVD immersion temperature sensors are used to measure the temperature in the pipelines of heating, ventilation and air-conditioning systems.

The immersion temperature sensors are used in conjunction with all loop controllers and control systems that have a sensor connection for the KP10 measuring element.

Content **Page**

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kieback&peter

Important Information Regarding Product Safety

Safety Instructions

This data sheet contains information on installing and commissioning the product "TVD". Each person who carries out work on this product must have read and understood this data sheet. If you have any questions that are not resolved by this data sheet, you can obtain further information from the supplier or manufacturer.

If the product is not used in accordance with this data sheet, the protection provided will be impaired.

Applicable regulations must be observed when installing and using the device. Within the EU, these include regulations regarding occupational safety and accident prevention as well as those from the VDE (Association for Electrical, Electronic & Information Technologies). If the device is used in other countries, it is the responsibility of the system installer or operator to comply with local regulations.

Mounting, installation and commissioning work on the devices may only be carried out by qualified technicians. Qualified technicians are persons who are familiar with the described product and who can assess given tasks and recognize possible dangers due to technical training, knowledge and experience as well as knowledge of the appropriate regulations.

Legend

WARNING

Indicates a hazard of medium risk which can result in death or severe bodily injury if it is not avoided.

CAUTION

Indicates a hazard of low risk which can result in minor or medium bodily injury if it is not avoided.

CAUTION

Indicates a hazard of medium risk which can result in material damage or malfunctions if it is not avoided.

NOTE

Indicates additional information that can simplify the work with the product for you.

Notes on Disposal

For disposal, the product is considered waste from electrical and electronic equipment (electronic waste) and must not be disposed of as household waste. Special treatment for specific components may be legally binding or ecologically sensible. The local and currently applicable legislation must be observed.

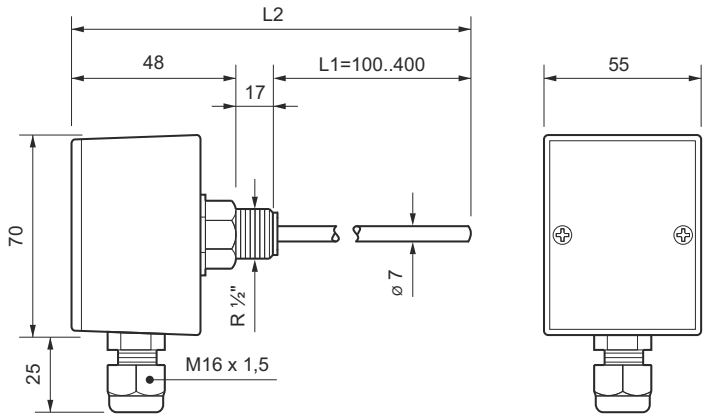
Item

TVD1	Immersion temperature sensor, 100 mm brass thermowell
TVD15	Immersion temperature sensor, 150 mm brass thermowell
TVD2	Immersion temperature sensor, 200 mm brass thermowell
TVD3	Immersion temperature sensor, 300 mm brass thermowell
TVD4	Immersion temperature sensor, 400 mm brass thermowell
TVD..-S6	Immersion temperature sensor, 100 mm..400 mm brass thermowell, specially designed for water chillers with the risk of condensation

Technical Data

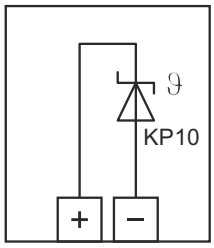
Function	Temperature voltage transmitter	
Measured quantity	Supply temperature	
Measuring element	KP10, 2.731 V at 0 °C, TC = 10 mV/K TDN..-S6: Measuring element is encapsulated in the thermowell	
Ambient temperature	-50 °C..+150 °C	
Measuring tolerance	Typically ±0.2K	
Measuring range	TVD	0 °C..+130 °C
	TVD..-S6	-20 °C..+130 °C
Ambient humidity	TVD	0% to 95% relative humidity, not permanently condensing
	TVD..-S6	Specially designed for water chillers with the risk of condensation
Thermowell	Brass, PN10, Ø 7 mm, R1/2" threaded connection ■ TVD1/TVD1-S6, length: 100 mm ■ TVD15/TVD15-S6, length: 150 mm ■ TVD2/TVD2-S6, length: 200 mm ■ TVD3/TVD3-S6, length 300 mm ■ TVD4/TVD4-S6, length: 400 mm	
Connection housing	Light gray plastic housing, M16 x 1.5 cable entry	
Degree of protection	IP65	

Dimensions



1 L1 = thermowell length
2 L2 = available space for installation in thermowells

Connection

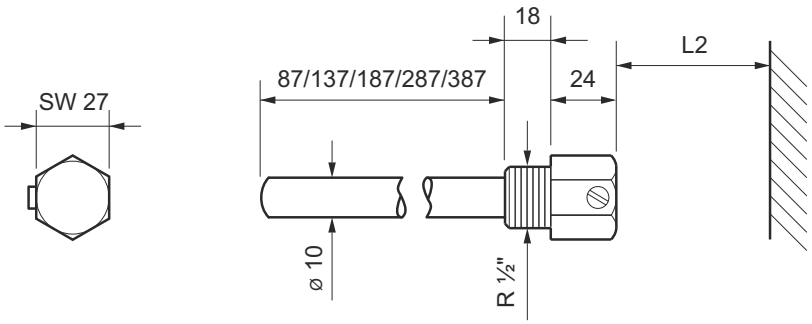


Accessories (not included)

Thermowell	Brass, PN10 (max. test pressure: 16 bar), Ø 10 mm, R½" threaded connection
Z5/TD1	For TVD1, TVD1-S6
Z5/TD15	For TVD15, TVD15-S6
Z5/TD2	For TVD2, TVD2-S6
Z5/TD3	For TVD3, TVD3-S6
Z5/TD4	For TVD4, TVD4-S6

Thermowell	Stainless steel 1.4571, PN16 (max. test pressure: 25 bar), Ø 10 mm, R½" threaded connection
Z6/TD1	For TVD1, TVD1-S6
Z6/TD15	For TVD15, TVD15-S6
Z6/TD2	For TVD2, TVD2-S6
Z6/TD3	For TVD3, TVD3-S6
Z6/TD4	For TVD4, TVD4-S6

Dimensions



1 L2 = available space for installation in thermowells

Mounting

CAUTION

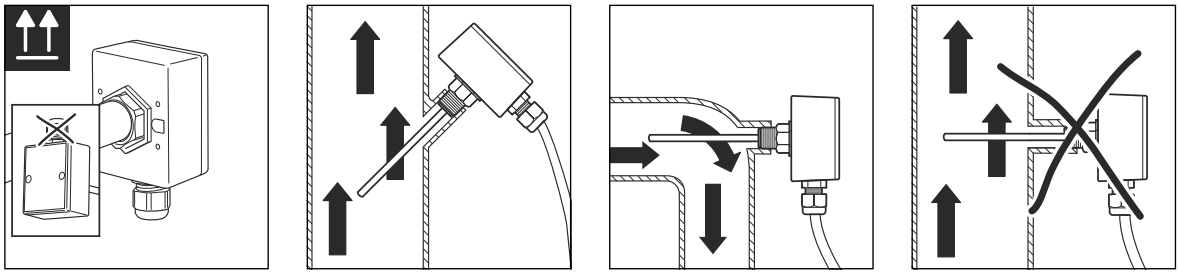
Installation and removal may only be performed by qualified technicians.

Installing the immersion temperature sensor

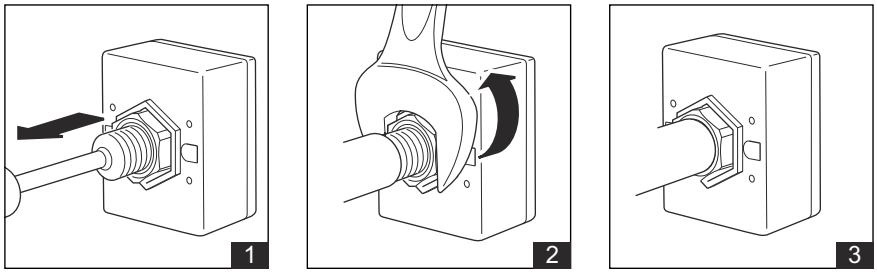
Only mount in the specified installation position.

In addition to generally applicable mounting guidelines for working on pipelines, the following must be observed:

- To record measurement more quickly, the thermowell must face against the direction of flow.
- In order to ensure accurate measurements, choose an installation location where no temperature stratifications occur. If possible, install the sensor downstream of pumps or mixture of two water flows. Ensure that there is a distance of approx. 10 x the pipe diameter between the valve and sensor.
- The medium must flow freely around the thermowell with the measuring element. The measuring length is 15 mm measured from the bottom of the thermowell.
- Be sure to leave enough space to connect the device.



- ► Use a wrench (27 mm) to secure the thermowell shaft (R½"). Do not screw it into the connection housing.
- ► In order to prevent moisture (condensate/pipe leakage) from entering the connection housing, the cable gland should point downwards. If that is not possible, make a downward-facing loop in the connection cable.



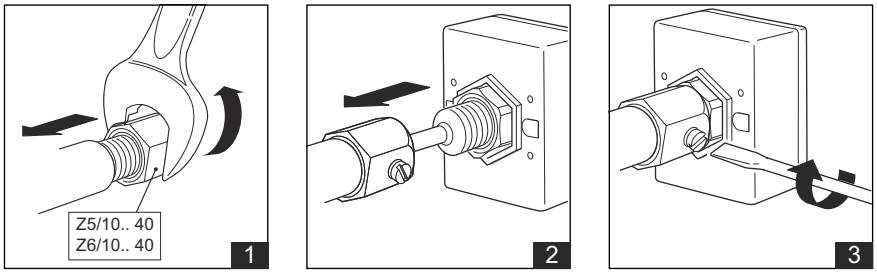
- ► When using a thermowell, observe the instructions in the Installation Using the Z5/TD1..4 or Z6/TD1..4 Thermowell section, page 6.

Installation Using the Z5/TD1..4 or Z6/TD1..4 Thermowell

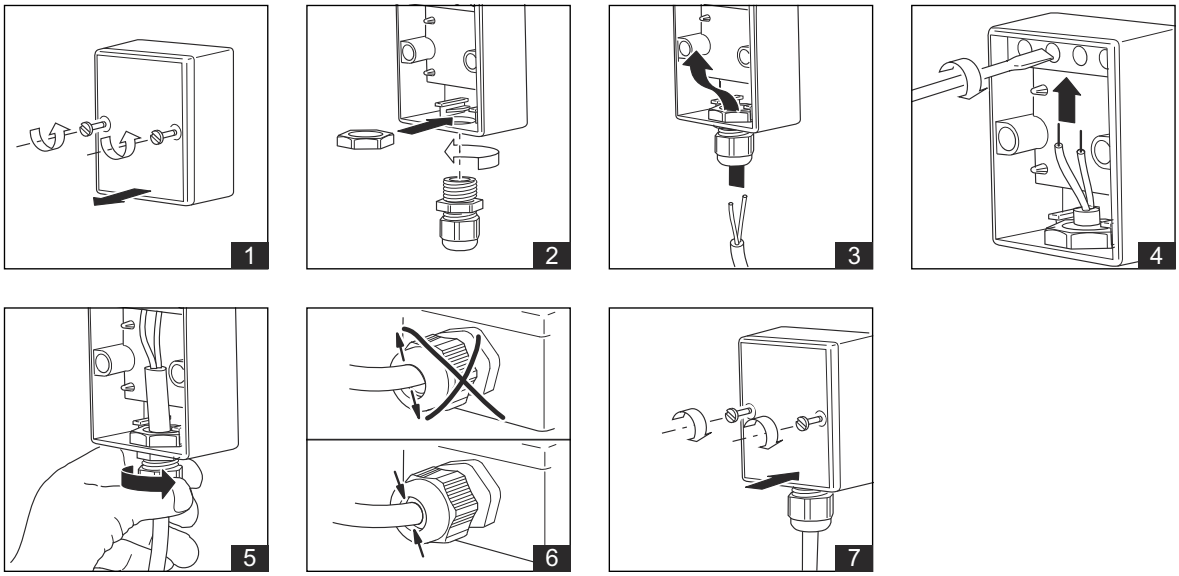
For improved thermal transfer between the thermowell and the sensor thermowell, fill the thermowell with a thermally conductive fluid. In this case, the thermowell must point downwards.

The thermowell shaft of the sensor must not be sealed.

► Insert the sensor into the thermowell and secure the retaining screw.



Installation



Temperature and Voltage Table for KP10

T (°C)	V (V)	T (°C)	V (V)	T (°C)	V (V)	T (°C)	V (V)	T (°C)	V (V)
-50	**2.23**	**-10**	**2.63**	**30**	**3.03**	**70**	**3.43**	**110**	**3.83**
-49	2.24	-9	2.64	31	3.04	71	3.44	111	3.84
-48	2.25	-8	2.65	32	3.05	72	3.45	112	3.85
-47	2.26	-7	2.66	33	3.06	73	3.46	113	3.86
-46	2.27	-6	2.67	34	3.07	74	3.47	114	3.87
-45	2.28	-5	2.68	35	3.08	75	3.48	115	3.88
-44	2.29	-4	2.69	36	3.09	76	3.49	116	3.89
-43	2.30	-3	2.70	37	3.10	77	3.50	117	3.90
-42	2.31	-2	2.71	38	3.11	78	3.51	118	3.91
-41	2.32	-1	2.72	39	3.12	79	3.52	119	3.92
-40	**2.33**	**0**	**2.73**	**40**	**3.13**	**80**	**3.53**	**120**	**3.93**
-39	2.34	1	2.74	41	3.14	81	3.54	121	3.94
-38	2.35	2	2.75	42	3.15	82	3.55	122	3.95
-37	2.36	3	2.76	43	3.16	83	3.56	123	3.96
-36	2.37	4	2.77	44	3.17	84	3.57	124	3.97
-35	2.38	5	2.78	45	3.18	85	3.58	125	3.98
-34	2.39	6	2.79	46	3.19	86	3.59	126	3.99
-33	2.40	7	2.80	47	3.20	87	3.60	127	4.00
-32	2.41	8	2.81	48	3.21	88	3.61	128	4.01
-31	2.42	9	2.82	49	3.22	89	3.62	129	4.02
-30	**2.43**	**10**	**2.83**	**50**	**3.23**	**90**	**3.63**	**130**	**4.03**
-29	2.44	11	2.84	51	3.24	91	3.64	131	4.04
-28	2.45	12	2.85	52	3.25	92	3.65	132	4.05
-27	2.46	13	2.86	53	3.26	93	3.66	133	4.06
-26	2.47	14	2.87	54	3.27	94	3.67	134	4.07
-25	2.48	15	2.88	55	3.28	95	3.68	135	4.08
-24	2.49	16	2.89	56	3.29	96	3.69	136	4.09
-23	2.50	17	2.90	57	3.30	97	3.70	137	4.10
-22	2.51	18	2.91	58	3.31	98	3.71	138	4.11
-21	2.52	19	2.92	59	3.32	99	3.72	139	4.12
-20	**2.53**	**20**	**2.93**	**60**	**3.33**	**100**	**3.73**	**140**	**4.13**
-19	2.54	21	2.94	61	3.34	101	3.74	141	4.14
-18	2.55	22	2.95	62	3.35	102	3.75	142	4.15
-17	2.56	23	2.96	63	3.36	103	3.76	143	4.16
-16	2.57	24	2.97	64	3.37	104	3.77	144	4.17
-15	2.58	25	2.98	65	3.38	105	3.78	145	4.18
-14	2.59	26	2.99	66	3.39	106	3.79	146	4.19
-13	2.60	27	3.00	67	3.40	107	3.80	147	4.20
-12	2.61	28	3.01	68	3.41	108	3.81	148	4.21
-11	2.62	29	3.02	69	3.42	109	3.82	149	4.22
-10	**2.63**	**30**	**3.03**	**70**	**3.43**	**110**	**3.83**	**150**	**4.23**

TD11..15, TDF12..15 Room Temperature Sensors

Application

TD11..15 and TDF12..15 are used to measure the room temperature.

The temperature sensors are used in conjunction with all Kieback&Peter loop controllers and control systems that have a sensor connection for the active KP10 measuring element.

Content

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Important Information Regarding Product Safety

Safety Instructions

This data sheet contains information on installing and commissioning the product "TD11..15, TDF12..15". Each person who carries out work on this product must have read and understood this data sheet. If you have any questions that are not resolved by this data sheet, you can obtain further information from the supplier or manufacturer.

If the product is not used in accordance with this data sheet, the protection provided will be impaired.

Applicable regulations must be observed when installing and using the device. Within the EU, these include regulations regarding occupational safety and accident prevention as well as those from the VDE (Association for Electrical, Electronic & Information Technologies). If the device is used in other countries, it is the responsibility of the system installer or operator to comply with local regulations.

Mounting, installation and commissioning work on the devices may only be carried out by qualified technicians. Qualified technicians are persons who are familiar with the described product and who can assess given tasks and recognize possible dangers due to technical training, knowledge and experience as well as knowledge of the appropriate regulations.

Legend

WARNING

Indicates a hazard of medium risk which can result in death or severe bodily injury if it is not avoided.

CAUTION

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CAUTION

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NOTE

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Notes on Disposal

For disposal, the product is considered waste from electrical and electronic equipment (electronic waste) and must not be disposed of as household waste. Special treatment for specific components may be legally binding or ecologically sensible. The local and currently applicable legislation must be observed.

Item

TD11	Room temperature sensor with active KP10 measuring element
TD12	Room temperature sensor with active KP10 measuring element
TDF12	Identical to TD12, but with additional 10 kΩ setting knob
TD13	Room temperature sensor (KP10) with push-button and LED display, push-button for switching from night or stand-by mode to the day operating state. The illuminated LED indicates day mode.
TDF13	Identical to TD13, but with additional 10 kΩ setting knob
TD14	Room temperature sensor (KP10) with sliding switch (on/off)
TDF14	Identical to TD14, but with additional 10 kΩ setting knob
TD15	Room temperature sensor (KP10) with 4-position sliding switch
TDF15	Identical to TD15, but with additional 10 kΩ setting knob

Technical Data

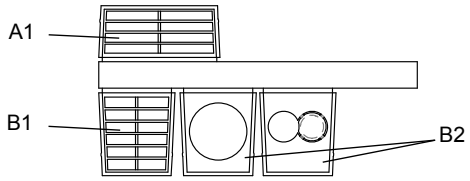
Function	Temperature voltage transmitter	
Measured quantity	Room temperature in homes or offices	
Measuring element	KP10 active measuring element; 2.73 V at 0 °C; TC = 10 mV/K	
Measuring tolerance	TD11	Verification with DDC parameterization on site
	TD12..TD15, TDF12..TDF15	Typically ±0.2 K
Measuring range	-20 °C to +60 °C	
Ambient temperature	-20 °C to +60 °C	
Ambient humidity	0% to 95% r.h.; non-condensing	
Housing	Plastic housing, RAL 9010 (pure white)	
Setting knob	TDF12..TDF15	10 kΩ potentiometer, linear, setting knob with trend arrows Setting knobs with scales available as accessories: 0 °C..50 °C, 8 °C..33 °C, 15 °C..25 °C, 0 °C..100 °C, ± 5 K
Push-button	TD13, TDF13	Floating contact, max. DC 24 V, 50 mA
LED	TD13, TDF13	LED, DC 12 V or DC 24 V
Switch	TD14, TDF14	On/Off sliding switch, floating, max. AC 24 V, 300 mA
Switch	TD15, TDF15	4-position sliding switch, floating, max. AC 24 V, 300 mA
Degree of protection	IP30	
Dimensions (WxHxD in mm)	TD11, TD12	82.5 x 82.5 x 27.7
	TD13..15, TDF12..15	82.5 x 82.5 x 28.3

Accessories (included in delivery)

The sensor cover has two ventilation inserts for quick measurement of the temperature.

The inserts plug into the cover.

- The included cover inserts may need to be exchanged for a surface-mount installation, for example



A1/B1	Inserts for increased air throughput
B2	Inserts for cable entry from below (surface mounting)

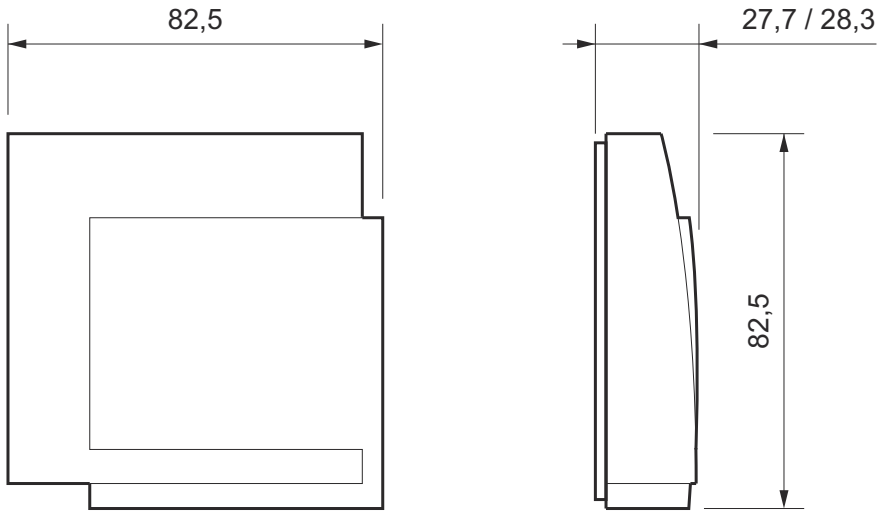
CAUTION

With B2, IP30 degree of protection only ensured when air gap at cable entry is ≤ 2.5 mm. Degree of protection without cover inserts: IP10.

Accessories (not included in delivery)

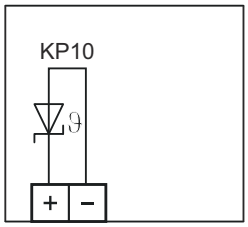
VS1	Anti-vandalism protection
BA	Ball protection cover

Dimensions

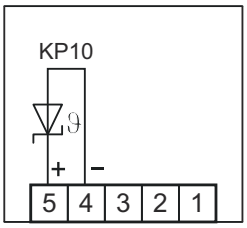


Connection

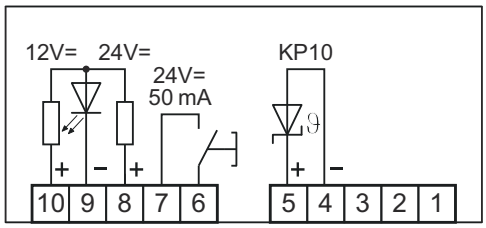
TD11



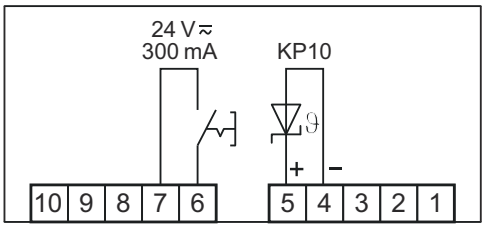
TD12



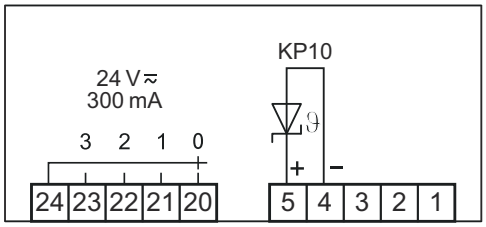
TD13



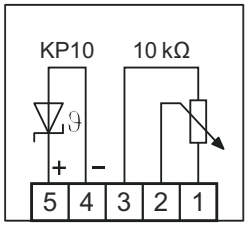
TD14



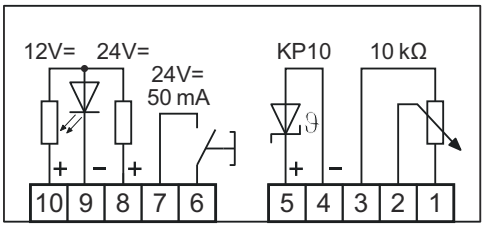
TD15



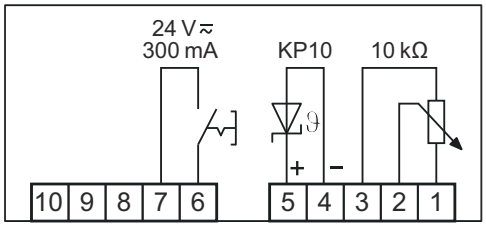
TDF12



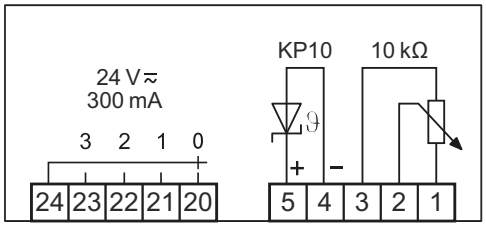
TDF13



TDF14



TDF15

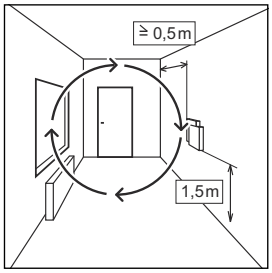


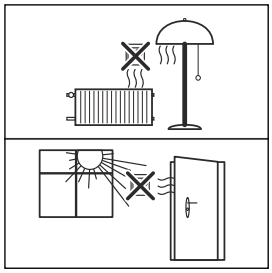
Mounting

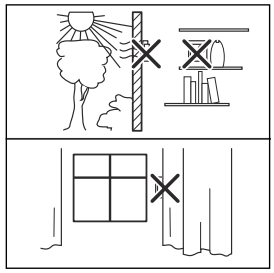
CAUTION

Installation and removal may only be carried out by qualified technicians when the power is switched off.

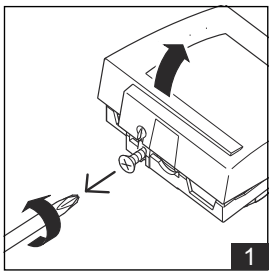
To ensure fast and accurate measurement of the room temperature, select an installation location within the room's air flow. The ventilation slots on the cover should be positioned vertically above one another.

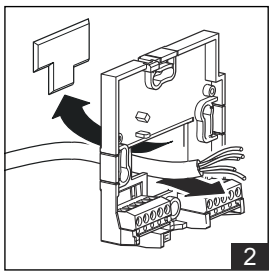


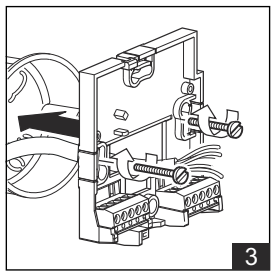


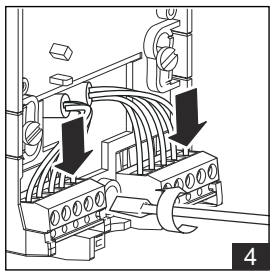


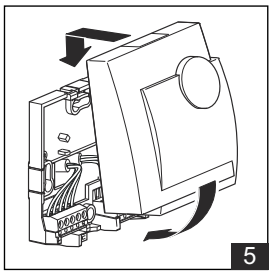
► Install the room temperature sensor on the wall or on flush-mounted boxes.

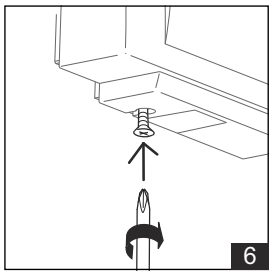












The sensor is uninstalled in reverse order.

Temperature and Voltage Table

Temperature and Voltage Table for the KP10 Measuring Element

T (°C)	V (V)	T (°C)	V (V)	T (°C)	V (V)	T (°C)	V (V)
-20	**2.53**	**0**	**2.73**	**20**	**2.93**	**40**	**3.13**
-19	2.54	1	2.74	21	2.94	41	3.14
-18	2.55	2	2.75	22	2.95	42	3.15
-17	2.56	3	2.76	23	2.96	43	3.16
-16	2.57	4	2.77	24	2.97	44	3.17
-15	2.58	5	2.78	25	2.98	45	3.18
-14	2.59	6	2.79	26	2.99	46	3.19
-13	2.60	7	2.80	27	3.00	47	3.20
-12	2.61	8	2.81	28	3.01	48	3.21
-11	2.62	9	2.82	29	3.02	49	3.22
-10	**2.63**	**10**	**2.83**	**30**	**3.03**	**50**	**3.23**
-9	2.64	11	2.84	31	3.04	51	3.24
-8	2.65	12	2.85	32	3.05	52	3.25
-7	2.66	13	2.86	33	3.06	53	3.26
-6	2.67	14	2.87	34	3.07	54	3.27
-5	2.68	15	2.88	35	3.08	55	3.28
-4	2.69	16	2.89	36	3.09	56	3.29
-3	2.70	17	2.90	37	3.10	57	3.30
-2	2.71	18	2.91	38	3.11	58	3.31
-1	2.72	19	2.92	39	3.12	59	3.32
0	**2.73**	**20**	**2.93**	**40**	**3.13**	**60**	**3.33**