

VASTUSLÄMPÖTILA-ANTURI LAIPALLA

TR10-F

TR10F-14369112

PT100 3-johdin -50-500°C 250x9 DN40 form2F

- Mittausalueet -196-600°C
- Vaihdeettava mittaosa
- Atex optiolla
- Saatavana lämpötilälähtetimestä
- Laipallisella TW40 suojaputkella



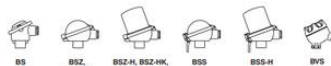
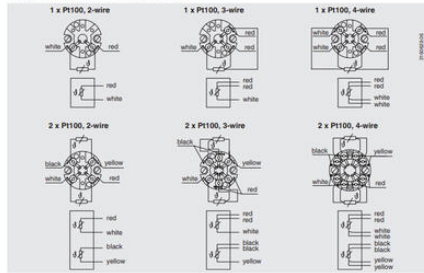
TUOTEKUVAUS

TR10-F sarjan vastuslämpötila-anturit on suunniteltu kiinnitettäväksi säiliöihin ja putkistoihin. Saatavilla on standardien DIN EN ja ASME mukaisia laippoja. Nämä lämpötilamittapääät sopivat nestemäisille ja kaasumaisille väliaineille, joita käytetään kohtalaisella mekaanisella kuormalla. Mukana putkimateriaalista valmistettu TW40-mallinen suojatasku.

TEKNISEET TIEDOT

Aineen kanssa kosketuksissa olevien osien materiaali	Ruostumaton teräs 316Ti
Asennussyvyys	250 mm
IP-luokka	IP65
Kaulan pituus	0,065 m
Kytinkotelon materiaali	Inconel - 600
Max. käyttölämpötila	500 °C
Max. painealue	16 bar
Max. ympäristön lämpötila	80 °C
Min. käyttölämpötila	-50 °C
Min. ympäristön lämpötila	-40 °C
Pistokkeen halkaisija	9 mm
Pituus	340 mm
Rungon materiaali	Alumiini

Electrical connection (colour code per IEC/EN 60719)



Model	Material	Cable entry thread size	Ingress protection (max.)	Cap	Surface	Connection to rack tube
BS	Aluminum	M20 x 1.5 or 1/2 NPT	IP65, IP68	Flat cap with 2 screws	Black, lacquered	M24 x 1.5, 1/2 NPT
BSZ	Aluminum	M20 x 1.5 or 1/2 NPT	IP65, IP68	Spherical hinged cover with cylinder head screw	Black, lacquered	M24 x 1.5, 1/2 NPT
BSZ-H	Aluminum	M20 x 1.5 or 1/2 NPT	IP65, IP68	Spherical hinged cover with cylinder head screw	Black, lacquered	M24 x 1.5, 1/2 NPT
BSZ-H / DIN19	Aluminum	2 x M20 x 1.5 or 2 x 1/2 NPT	IP65, IP68	Raised hinged cover with cylinder head screw	Black, lacquered	M24 x 1.5
BSZ-H / DIN19 H	Aluminum	M20 x 1.5 or 1/2 NPT	IP65	Raised hinged cover with cylinder head screw	Black, lacquered	M24 x 1.5, 1/2 NPT
BSS	Aluminum	M20 x 1.5 or 1/2 NPT	IP65	Spherical hinged cover with clamping lever	Black, lacquered	M24 x 1.5, 1/2 NPT
BSS-H	Aluminum	M20 x 1.5 or 1/2 NPT	IP65	Raised hinged cover with clamping lever	Black, lacquered	M24 x 1.5, 1/2 NPT
BVS	Stainless steel	M20 x 1.5	IP65	Precision-steel screw-on lid	Black, electropolished	M24 x 1.5
BSZ-K	Plastic	M20 x 1.5 or 1/2 NPT	IP65	Spherical hinged cover with cylinder head screw	Black	M24 x 1.5
BSZ-HK	Plastic	M20 x 1.5 or 1/2 NPT	IP65	Raised hinged cover with cylinder head screw	Black	M24 x 1.5

Model	Explosion protection	Ex I (gpa)	Ex I (dust)	Ex II (gpa)	Ex II (dust)
BS	without	Zone 6, 1, 2	Zone 20, 21, 22	Zone 2	Zone 22
BSZ	X	X	X	X	X
BSZ-H (2x cable outlet)	X	X	X	X	X
BSZ-H / DIN19 H	X	X	X	X	X
BSS	X	X	X	X	X
BSS-H	X	X	X	X	X
BVS	X	X	X	X	X
BSZ-K	X	X	X	X	X
BSZ-HK	X	X	X	X	X

Cable entry



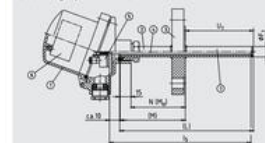
The pictures show examples of connection heads.

Cable entry	Cable entry thread size
Standard cable entry	M20 x 1.5 or 1/2 NPT
Plastic cable gland (cable Ø ... 16 mm)	M20 x 1.5 or 1/2 NPT
Nickel-plated brass cable gland (cable Ø 6 ... 12 mm)	M20 x 1.5 or 1/2 NPT
Stainless steel cable gland (cable Ø 7 ... 12 mm)	M20 x 1.5 or 1/2 NPT
Plain threaded	M20 x 1.5 or 1/2 NPT
2 x M20 x 1.5	2 x M20 x 1.5
Junction box M12 x 1 (4-pin)	M20 x 1.5
Sealing plugs for transport	M20 x 1.5 or 1/2 NPT

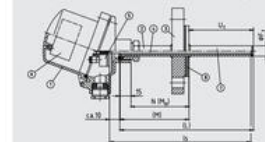
Cable entry	Colour	Ingress protection (max.)	Min./max. ambient temperature	Explosion protection	Ex I (gpa)	Ex I (dust)	Ex II (gpa)	Ex II (dust)
Standard cable entry	Black	IP65	-40 ... +80 °C	X	X	X	X	X
Plastic cable gland	Black or grey	IP68, IP69	-40 ... +80 °C	X	X	X	X	X
Plastic cable gland, Ex e	Light blue	IP68, IP69	-40 ... +80 °C (standard) -40 ... +70 °C (optional)	X	X	X	X	X
Plastic cable gland, Ex e	Black	IP68, IP69	-40 ... +80 °C (standard) -40 ... +70 °C (optional)	X	X	X	X	X
Nickel-plated brass cable gland	Black	IP68, IP69	-40 °C / -40 ... +80 °C	X	X	X	X	X
Nickel-plated brass cable gland, Ex e	Black	IP68, IP69	-40 °C / -40 ... +80 °C	X	X	X	X	X
Stainless steel cable gland	Black	IP68, IP69	-40 °C / -40 ... +80 °C	X	X	X	X	X
Stainless steel cable gland, Ex e	Black	IP68, IP69	-40 °C / -40 ... +80 °C	X	X	X	X	X
Plain threaded	-	IP60	-	X	X	X	X	X
2 x M20 x 1.5	-	IP60	-	X	X	X	X	X
Junction box M12 x 1 (4-pin)	-	IP65	-40 ... +80 °C	X	X	X	X	X
Sealing plugs for transport	Transparent	-	-40 ... +80 °C	not applicable, transport protection	-	-	-	-

Components model TR10-F

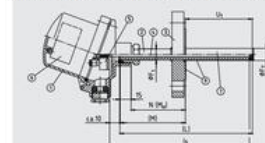
Version: flanged protection tube from standard material



Version: flange form standard material, protection tube and flange disc from special materials



Version: flanged protection tube from standard material with tantalum cover

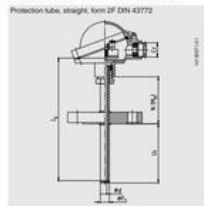


Legend:	Connection head
1	Rack tube
2	Flange
3	Measuring insert (TR10-F)
4	Normal disc/separator (optional)
5	Separator (optional)
6	Protection tube
7	Flange disc from special material
8	Tantalum cover
9	Tantalum cover
10	Overall length of protection tube
11	Measuring insert length
12	Protection tube insertion length in accordance with DIN 43772
13	Protection tube diameter
14	Outer diameter of flange cover
15	Flange length
16	Rack tube length

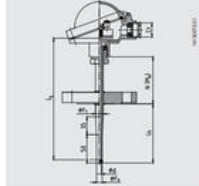
Protection tube

Protection tube designs

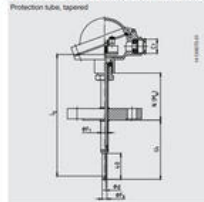
Protection tube, straight, form 2F DIN 43772



Protection tube, tapered, form 3F DIN 43772

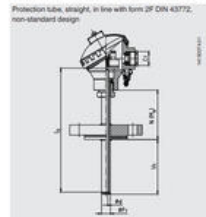


Protection tube in line with DIN 43772, weld-on solid tip



Legend	
l_1	Insertion length
l_2	Measuring insert length
$N(M_{L_2})$	Neck length
C_1	Thread cable entry
ϕF_1	Protection tube diameter

Protection tube in line with DIN 43772, welded parts from special material, girder flange: stainless steel



Protection tube in line with DIN 43772, tantalum cover with tantalum flange disc, carrier protection tube: stainless steel



Legend)	
U_1	Insertion length
l	Measuring insert length
$H (M_{H_1})$	Neck length
C_1	Thread cable entry
D_1	Protection tube diameter

The pictures show examples of connection heads.

Protection tube designs in accordance with DIN 43772

Protection tube	Material	Protection tube Ø	Insert Ø	Connection to head
Straight, form 2F DIN 43772	Stainless steel 1.4571	9 x 1 mm 11 x 2 mm 12 x 2.5 mm	6 mm	M24 x 1.5 possible Predefined connection, male nut
Tapered, form 3F DIN 43772	Stainless steel 1.4571	12 x 2.5 mm, tapered to 9 mm	6 mm	M24 x 1.5 possible Predefined connection, male nut

Protection tube designs in line with DIN 43772, weld-on solid tip

Protection tube	Material	Protection tube Ø	Insert Ø	Connection to head
Tapered, weld-on solid tip, in line with DIN 43772, non-standard design	Stainless steel 1.4571	9 x 1 mm, tapered to 6 mm 11 x 2 mm, tapered to 6 mm 12 x 2.5 mm, tapered to 6 mm	3 mm	M24 x 1.5 possible Predefined connection, male nut

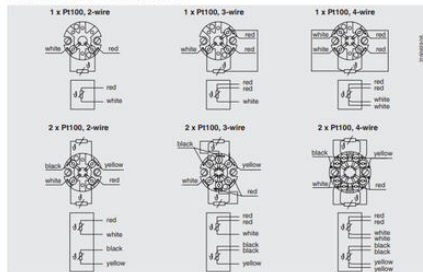
Protection tube designs in line with DIN 43772, welded parts: special material, girder flange: stainless steel

Protection tube	Material	Protection tube Ø	Insert Ø	Connection to head
Straight, in line with form 2F DIN 43772, non-standard design	2.460 (MonelK500) / stainless steel 2.4810 (Hastelloy C276) / stainless steel 2.4810 (Hastelloy C4) / stainless steel 3.7005 (Titan Grade 5) / stainless steel	13.7 x 2.2 mm	6 mm with sleeve Ø 6 mm / 8 mm	M24 x 1.5 possible Predefined connection, male nut

Protection tube designs in line with DIN 43772, tantalum cover with tantalum flange disc, carrier protection tube: stainless steel

Protection tube	Material	Protection tube Ø	Insert Ø	Connection to head
Straight, in line with form 2F DIN 43772, non-standard design	Tantalum / stainless steel	11 x 2 mm, tantalum cover 12 x 0.4 mm 15 x 3 mm, tantalum cover 18 x 0.4 mm	6 mm	M24 x 1.5 possible Predefined connection, male nut
Tapered, in line with form 3F DIN 43772, non-standard design	Tantalum / stainless steel	12 x 2.5 mm, tantalum cover 13 x 0.4 mm	6 mm	M24 x 1.5 possible Predefined connection, male nut

Electrical connection (colour code per IEC-EN 60719)



Cable entry



The pictures show examples of connection heads.

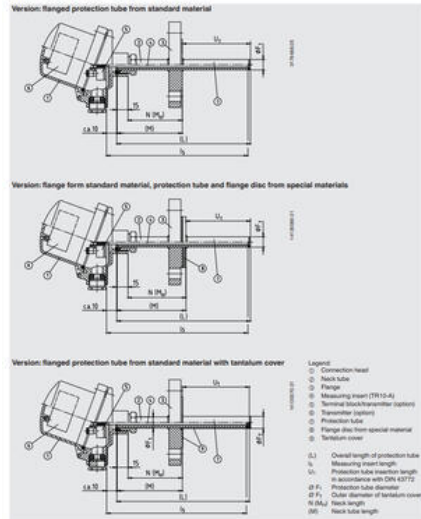
Cable entry	Cable entry thread size
Standard cable entry ¹⁾	M20 x 1.5 or 1/2 NPT
Plastic cable gland (cable Ø 6 ... 18 mm) ¹⁾	M20 x 1.5 or 1/2 NPT
Nickel-plated brass cable gland (cable Ø 6 ... 12 mm)	M20 x 1.5 or 1/2 NPT
Stainless steel cable gland (cable Ø 7 ... 12 mm)	M20 x 1.5 or 1/2 NPT
Plain threaded	M20 x 1.5 or 1/2 NPT
2 x M20 x 1.5 ¹⁾	2 x M20 x 1.5
Junction box M12 x 1 (4-pin) ¹⁾	M20 x 1.5
Sealing plug for transport	M20 x 1.5 or 1/2 NPT

Model	Material	Cable entry thread size	Ingress protection (IP)	Explosion protection	Explosion protection (Ex)	Explosion protection (Ex)	Explosion protection (Ex)	Explosion protection (Ex)
BS	Aluminum	M20 x 1.5 or 1/2 NPT ¹⁾	IP65, IP68	Flat cap with 2 screws	Blue, lacquered ¹⁾	MD4 x 1.5, 1/2 NPT	MD4 x 1.5, 1/2 NPT	MD4 x 1.5, 1/2 NPT
BS2	Aluminum	M20 x 1.5 or 1/2 NPT ¹⁾	IP65, IP68	Spherical flanged cover with cylinder head screw	Blue, lacquered ¹⁾	MD4 x 1.5, 1/2 NPT	MD4 x 1.5, 1/2 NPT	MD4 x 1.5, 1/2 NPT
BS2-H	Aluminum	M20 x 1.5 or 1/2 NPT ¹⁾	IP65, IP68	Raised flanged cover with cylinder head screw	Blue, lacquered ¹⁾	MD4 x 1.5, 1/2 NPT	MD4 x 1.5, 1/2 NPT	MD4 x 1.5, 1/2 NPT
BS2-H (Ex cable outlet)	Aluminum	2 x M20 x 1.5 or 2 x 1/2 NPT ¹⁾	IP65, IP68	Raised flanged cover with cylinder head screw	Blue, lacquered ¹⁾	MD4 x 1.5, 1/2 NPT	MD4 x 1.5, 1/2 NPT	MD4 x 1.5, 1/2 NPT
BS2-H / D9110 ¹⁾	Aluminum	M20 x 1.5 or 1/2 NPT ¹⁾	IP65	Raised flanged cover with cylinder head screw	Blue, lacquered ¹⁾	MD4 x 1.5, 1/2 NPT	MD4 x 1.5, 1/2 NPT	MD4 x 1.5, 1/2 NPT
BSS	Aluminum	M20 x 1.5 or 1/2 NPT ¹⁾	IP65	Spherical flanged cover with clamping lever	Blue, lacquered ¹⁾	MD4 x 1.5, 1/2 NPT	MD4 x 1.5, 1/2 NPT	MD4 x 1.5, 1/2 NPT
BSS-H	Aluminum	M20 x 1.5 or 1/2 NPT ¹⁾	IP65	Raised flanged cover with clamping lever	Blue, lacquered ¹⁾	MD4 x 1.5, 1/2 NPT	MD4 x 1.5, 1/2 NPT	MD4 x 1.5, 1/2 NPT
BVS	Stainless steel	M20 x 1.5 ¹⁾	IP65	Physion-clad screw on lid	Black, electropolished	MD4 x 1.5	MD4 x 1.5	MD4 x 1.5
BS2-A	Plastic	M20 x 1.5 or 1/2 NPT ¹⁾	IP65	Spherical flanged cover with cylinder head screw	Black	MD4 x 1.5	MD4 x 1.5	MD4 x 1.5
BS2-HK	Plastic	M20 x 1.5 or 1/2 NPT ¹⁾	IP65	Raised flanged cover with cylinder head screw	Black	MD4 x 1.5	MD4 x 1.5	MD4 x 1.5

Model	Explosion protection				
	Without	Ex i (gas) Zone 0, 1, 2	Ex i (dust) Zone 20, 21, 22	Ex nA (gas) Zone 2	Ex t (dust) Zone 22
BS	x	x	-	-	-
BS2	x	x	x	x	x
BS2-H	x	x	x	x	x
BS2-H (Ex cable outlet)	x	x	x	x	x
BSS	x	x	-	-	-
BSS-H	x	x	-	-	-
BVS	x	x	-	-	-
BS2-A	x	x	-	-	-
BS2-HK	x	x	-	-	-

Cable entry	Colour	Ingress protection (IP)	Min. max. ambient temperature	Explosion protection	Explosion protection (Ex)	Explosion protection (Ex)	Explosion protection (Ex)	Explosion protection (Ex)
Standard cable entry ¹⁾	Black	IP65	-40 ... +80 °C	x	x	-	-	-
Plastic cable gland	Black or grey	IP65, IP68	-40 ... +80 °C	x	-	-	-	-
Plastic cable gland, Ex ¹⁾	Light blue	IP65, IP68	-20 ... +80 °C (standard) -40 ... +75 °C (optional)	x	x	-	-	-
Plastic cable gland, Ex ¹⁾	Black	IP65, IP68	-20 ... +80 °C (standard) -40 ... +75 °C (optional)	x	-	-	-	-
Nickel-plated brass cable gland	Black	IP65, IP68	-40 °C / -40 ... +80 °C	x	x	-	-	-
Nickel-plated brass cable gland, Ex ¹⁾	Black	IP65, IP68	-40 °C / -40 ... +80 °C	x	x	x	x	x
Stainless steel cable gland	Black	IP65, IP68	-40 °C / -40 ... +80 °C	x	x	-	-	-
Stainless steel cable gland, Ex ¹⁾	Black	IP65, IP68	-40 °C / -40 ... +80 °C	x	x	x	x	x
Plain threaded	-	IP60	-	x	x	x	x	x
2 x M20 x 1.5 ¹⁾	-	IP65	-40 ... +80 °C	x	x	-	-	-
Junction box M12 x 1 (4-pin) ¹⁾	-	IP65	-40 ... +80 °C	x	x	-	-	-
Sealing plug for transport	Transparent	-	-40 ... +80 °C	not applicable, transport protection	-	-	-	-

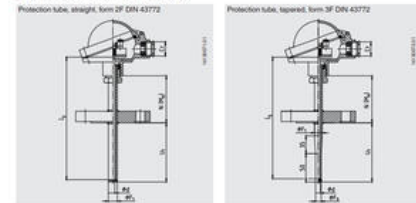
Components model TR10-F



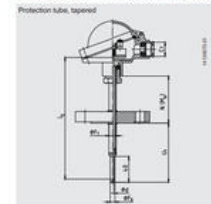
Protection tube

Protection tube designs

Protection tube in accordance with DIN 43772



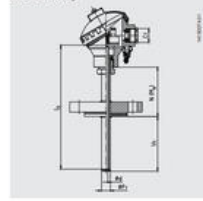
Protection tube in line with DIN 43772, weld-on solid tip



Legend:	l ₁ Insertion length	Ø F ₁ Diameter of protection tube tip
l ₂ Measuring insert length	Ø F ₂ Outer diameter of tantalum cover	l ₃ Back length
Ø F ₃ Outer diameter of protection tube	Ø F ₄ Measuring insert diameter	Ø F ₅ Thread cable entry
Ø F ₆ Protection tube diameter		

Protection tube in line with DIN 43772, wetted parts from special material, gilder flange stainless steel

Protection tube, straight, in line with form 3F DIN 43772, non-standard design



Protection tube in line with DIN 43772, tantalum cover with tantalum flange disc, carrier protection tube: stainless steel



Legend:	l ₁ Insertion length	Ø F ₁ Diameter of protection tube tip
l ₂ Measuring insert length	Ø F ₂ Outer diameter of tantalum cover	l ₃ Back length
Ø F ₃ Outer diameter of protection tube	Ø F ₄ Measuring insert diameter	Ø F ₅ Thread cable entry
Ø F ₆ Protection tube diameter		

The pictures show examples of connection heads.

Protection tube designs in accordance with DIN 43772

Protection tube	Material	Protection tube Ø	Suitable for measuring insert Ø	Connection to head
Straight, form 3F DIN 43772	Stainless steel 1.4371	9 x 1 mm 11 x 2 mm 12 x 2.5 mm 14 x 2.5 mm	6 mm	MD4 x 1.5 (rotatable threaded connection, male nut)
Tapered, form 3F DIN 43772	Stainless steel 1.4371	12 x 2.5 mm, tapered to 6 mm	6 mm	

Protection tube designs in line with DIN 43772, weld-on solid tip

Protection tube	Material	Protection tube Ø	Suitable for measuring insert Ø	Connection to head
Tapered, weld-on solid tip, in line with DIN 43772, non-standard design	Stainless steel 1.4371	9 x 1 mm, tapered to 6 mm 11 x 2 mm, tapered to 6 mm 12 x 2.5 mm, tapered to 6 mm	6 mm	MD4 x 1.5 (rotatable threaded connection, male nut)

Protection tube designs in line with DIN 43772, wetted parts: special material, gilder flange stainless steel

Protection tube	Material	Protection tube Ø	Suitable for measuring insert Ø	Connection to head
Straight, in line with form 3F DIN 43772, non-standard design	2.4360 (MonelK500) / stainless steel 2.4819 (Inconel 625) / stainless steel 2.4610 (Hastelloy C4) / stainless steel 3.7035 (Titan Grade 2)	13.7 x 2.2 mm	6 mm with sleeve Ø 6 mm / 8 mm	MD4 x 1.5 (rotatable threaded connection, male nut)

Protection tube designs in line with DIN 43772, tantalum cover with tantalum flange disc, carrier protection tube: stainless steel

Protection tube	Material	Protection tube Ø	Suitable for measuring insert Ø	Connection to head
Straight, in line with form 3F DIN 43772, non-standard design	Tantalum / stainless steel	11 x 2 mm, tantalum cover 12 x 0.4 mm 15 x 3 mm, tantalum cover 18 x 0.4 mm	6 mm 6 mm with sleeve Ø 6 mm / 8 mm	MD4 x 1.5 (rotatable threaded connection, male nut)
Tapered, in line with form 3F DIN 43772, non-standard design	Tantalum / stainless steel	12 x 2.5 mm, tantalum cover 13 x 0.4 mm	6 mm	