Threaded protection tube
Design per DIN 43772 form 5, 8
Model TW45

Applications

- Chemical industry, process technology, equipment manufacturing
- For low and medium process loads

Special features

- Designs per DIN 43772
- Design TW45-F: Form 5
  Design TW45-G: Form 8

Fig. left: Design TW45-F
Fig. right: Design TW45-G

Description

Each thermowell/protection tube is an important component of any temperature measuring location. It is used to separate the process from the surrounding area, thus protecting the environment and operating personnel and keeps aggressive media, high pressures and flow rates from the temperature probe itself and thereby enables the thermometer to be exchanged during operation.

Based on the almost limitless application possibilities, there are a large number of variants, such as thermowell designs or materials. The type of process connection and the basic method of manufacture are important design differentiation criteria. A basic differentiation can be made between threaded and weld-in thermowells/protection tubes, and those with flange connections.

Furthermore, one can differentiate between protection tubes and thermowells. Protection tubes are constructed from a tube, that is closed at the tip by a welded solid tip. Thermowells are manufactured from solid bar stock.

The TW45 series of threaded protection tubes are suitable for use with numerous electrical and mechanical thermometers from WIKA.

Due to their design to DIN 43772, these protection tubes for low and medium process loads are suitable for use in the chemical industry, process technology and equipment manufacturing.

Specifications

Basic information			
Protection tube form			
Design TW45-F	Form 5		
Design TW45-G	Form 8		
Version	■ Version per DIN 43772 ■ Design similar to DIN 43772 (fast response)		
Material (wetted)	■ Stainless steel 1.4571		

Process connection			
Type of process connection	■ G ½ B male thread ■ G ¾ B male thread		
Connection to thermometer			
Design TW45-F	■ G ½ female thread ■ G ¾ female thread		
Design TW45-G	■ G ½ B male thread ■ G ¾ B male thread		
Bore size			
Designs per DIN 43772	■ Ø 7 mm [0.28 in] ■ Ø 9 mm [0.35 in] ■ Ø 11 mm [0.43 in]		
Designs similar to DIN 43772, fast response	■ Ø 6.2 mm [0.24 in] ■ Ø 8.2 mm [0.32 in] ■ Ø 8.5 mm [0.34 in] ■ Ø 10.2 mm [0.4 in]		
Insertion length U			
Design TW45-F	■ 82 mm [3.23 in] ■ 142 mm [5.59 in] ■ 182 mm [7.17 in] ■ 232 mm [9.13 in] ■ 382 mm [15.04 in]		
Design TW45-G	■ 73 mm [2.87 in] ■ 110 mm [4.33 in] ■ 170 mm [6.69 in] ■ 260 mm [10.24 in] ■ 410 mm [16.14 in]		
Overall length L	Insertion length U_1 + 28 mm [1.1 in]		
Suitable stem length l_1 (dial thermometer)			
Design TW45-F	Connection design S [1], 4 or 5	l_1 = L - 10 mm [0.4 in] or l_1 = U_1 + 18 mm [0.7 in]	
	Connection design 2	l_1 = L - 30 mm [1.2 in] or l_1 = U_1 - 2 mm [0.1 in]	
Design TW45-G	Connection design 3	l_1 = L - 12 mm [0.5 in] or l_1 = U_1 + 16 mm [0.6 in]	
Suitable insertion length l_1 (machine glass thermometer)			
Design TW45-F	Connection design E	l_1 = L - 10 mm [0.4 in] or l_1 = U_1 + 18 mm [0.7 in]	
Design TW45-G	Connection design 3	Process connection (thermometer): G ½	l_1 = L - 12 mm [0.5 in] or l_1 = U_1 + 16 mm [0.6 in]
		Process connection (thermometer): G ¾	l_1 = L - 8 mm [0.3 in] or l_1 = U_1 + 20 mm [0.8 in]

1) Not suitable for use with protection tube inner diameter 6.2 mm (tube 8 x 0.9 mm), Ø 8.2 mm (tube 10 x 0.9 mm) and 10.2 mm (tube 12 x 0.9 mm).

Operating conditions	
Max. process temperature, process pressure	Depending on: ■ Load diagram DIN 43772 ■ Protection tube design - Dimensions - Material ■ Process conditions - Flow rate - Medium density
Wake frequency calculation (option)	The calculation in accordance with Dittrich/Klotter of individual thermowells minimises the risk of dynamic damage that can be caused by the vortex shedding of a Kármán vortex street (Vortex Induced Vibration; VIV). In addition, the static loads due to lateral flow and the process pressure are calculated depending on the temperature. The calculation will be carried out as a WIKA engineered service (subject to charges). → For further information, see Technical information IN 00.15 “Wake frequency calculation”.

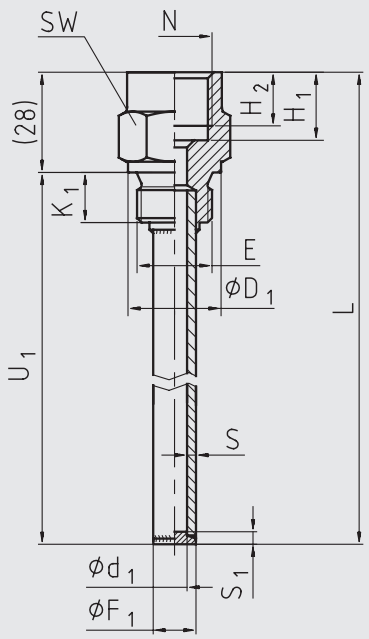
Certificates (option)

Certificates	
Certificates	■ 2.2 test report ■ 3.1 inspection certificate

Approvals and certificates, see website

Dimensions in mm [in]

Design TW45-F



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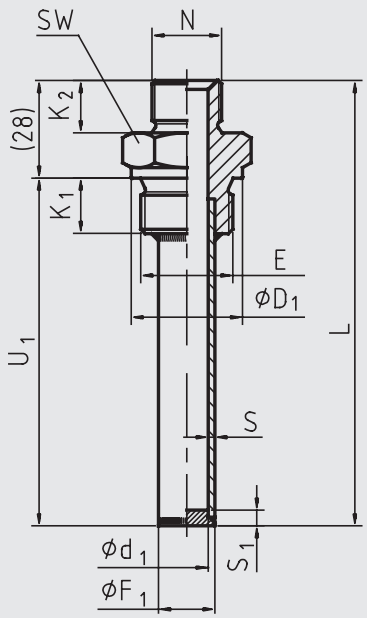
Legend:

E	Process connection
H_1	Bore depth for female thread
H_2	Length of female thread
K_1	Length of stud end
L	Overall length
N	Connection to thermometer
S	Wall thickness
S_1	Tip thickness
SW	Spanner width
U_1	Insertion length
Ø d_1	Bore size
Ø D_1	Diameter of the sealing collar
Ø F_1	Protection tube outer diameter

Material	Dimensions in mm [in]											Weight in kg [lbs]	
	E	N	Ø d_1	Ø D_1	Ø F_1	H_1	H_2	K_1	S	S_1	SW	U_1 = 82 mm [3.22 in]	U_1 = 382 mm [15.04 in]
Stainless steel 1.4571	G ½ B	G ½	7 [0.28]	26 [1.02]	12 [0.47]	19 [0.75]	15 [0.59]	14 [0.55]	2.5 [0.1]	3.5 [0.15]	27 [1.06]	0.15 [0.33]	0.33 [0.73]
	G ½ B	G ½	9 [0.35]	26 [1.02]	14 [0.55]	19 [0.75]	15 [0.59]	14 [0.55]	2.5 [0.1]	3.5 [0.14]	27 [1.06]	0.15 [0.33]	0.36 [0.79]
	G ½ B	G ½	11 [0.43]	26 [1.02]	14 [0.55]	19 [0.75]	15 [0.59]	14 [0.55]	1.5 [0.06]	2.5 [0.1]	27 [1.06]	0.12 [0.26]	0.28 [0.62]
	G ½ B	G ½	6.2 [0.24]	26 [1.02]	8 [0.32]	19 [0.75]	15 [0.59]	14 [0.55]	0.9 [0.04]	1 [0.04]	27 [1.06]	0.12 [0.26]	0.18 [0.4]
	G ½ B	G ½	8.2 [0.32]	26 [1.02]	10 [0.39]	19 [0.75]	15 [0.59]	14 [0.55]	0.9 [0.04]	1 [0.04]	27 [1.06]	0.12 [0.26]	0.18 [0.4]
	G ½ B	G ½	10.2 [0.40]	26 [1.02]	12 [0.47]	19 [0.75]	15 [0.59]	14 [0.55]	0.9 [0.04]	1 [0.04]	27 [1.06]	0.12 [0.26]	0.19 [0.42]
	G ¾ B	G ½	7 [0.28]	32 [1.26]	12 [0.47]	19 [0.75]	15 [0.59]	16 [0.63]	2.5 [0.1]	3.5 [0.14]	32 [1.26]	0.24 [0.53]	0.42 [0.93]
	G ¾ B	G ½	9 [0.35]	32 [1.26]	14 [0.55]	19 [0.75]	15 [0.59]	16 [0.63]	2.5 [0.1]	3.5 [0.14]	32 [1.26]	0.24 [0.53]	0.45 [0.99]
	G ¾ B	G ½	11 [0.43]	32 [1.26]	14 [0.55]	19 [0.75]	15 [0.59]	16 [0.63]	1.5 [0.06]	2.5 [0.1]	32 [1.26]	0.22 [0.49]	0.37 [0.82]
	G ¾ B	G ½	6.2 [0.24]	32 [1.26]	8 [0.32]	19 [0.75]	15 [0.59]	16 [0.63]	0.9 [0.04]	1 [0.04]	32 [1.26]	0.21 [0.46]	0.27 [0.6]
	G ¾ B	G ½	8.2 [0.32]	32 [1.26]	10 [0.39]	19 [0.75]	15 [0.59]	16 [0.63]	0.9 [0.04]	1 [0.04]	32 [1.26]	0.21 [0.46]	0.27 [0.6]
	G ¾ B	G ½	10.2 [0.40]	32 [1.26]	12 [0.47]	19 [0.75]	15 [0.59]	16 [0.63]	0.9 [0.04]	1 [0.04]	32 [1.26]	0.21 [0.46]	0.28 [0.62]
	G ¾ B	G ¾	7 [0.28]	32 [1.26]	12 [0.47]	22 [0.87]	17 [0.67]	16 [0.63]	2.5 [0.1]	3.5 [0.14]	32 [1.26]	0.20 [0.44]	0.38 [0.84]
	G ¾ B	G ¾	9 [0.35]	32 [1.26]	14 [0.55]	22 [0.87]	17 [0.67]	16 [0.63]	2.5 [0.1]	3.5 [0.14]	32 [1.26]	0.20 [0.44]	0.41 [0.9]

Material	Dimensions in mm [in]											Weight in kg [lbs]	
	E	N	Ø d_1	Ø D_1	Ø F_1	H_1	H_2	K_1	S	S_1	SW	U_1 = 82 mm [3.22 in]	U_1 = 382 mm [15.04 in]
Stainless steel 1.4571	G ¾ B	G ¾	11 [0.43]	32 [1.26]	14 [0.55]	22 [0.87]	17 [0.67]	16 [0.63]	1.5 [0.06]	2.5 [0.1]	32 [1.26]	0.18 [0.4]	0.33 [0.73]
	G ¾ B	G ¾	6.2 [0.24]	32 [1.26]	8 [0.32]	22 [0.87]	17 [0.67]	16 [0.63]	0.9 [0.035]	1 [0.04]	32 [1.26]	0.17 [0.37]	0.23 [0.51]
	G ¾ B	G ¾	8.2 [0.32]	32 [1.26]	10 [0.39]	22 [0.87]	17 [0.67]	16 [0.63]	0.9 [0.04]	1 [0.04]	32 [1.26]	0.17 [0.37]	0.23 [0.51]
	G ¾ B	G ¾	10.2 [0.40]	32 [1.26]	12 [0.47]	22 [0.87]	17 [0.67]	16 [0.63]	0.9 [0.04]	1 [0.04]	32 [1.26]	0.17 [0.37]	0.24 [0.53]
Copper alloy	G ½ B	G ½	8.5 [0.34]	26 [1.02]	10 [0.39]	19 [0.75]	15 [0.59]	14 [0.55]	0.75 [0.03]	0.75 [0.03]	27 [1.06]	0.11 [0.24]	0.18 [0.4]
	G ¾ B	G ½	8.5 [0.34]	32 [1.26]	10 [0.39]	19 [0.75]	15 [0.59]	16 [0.63]	0.75 [0.03]	0.75 [0.03]	32 [1.26]	0.23 [0.51]	0.29 [0.64]

Design TW45-G



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Legend:

E	Process connection
K_1	Length of stud end
K_2	Length of stud end for thermometer
L	Overall length
N	Connection to thermometer
S	Wall thickness
S_1	Tip thickness
SW	Spanner width
U_1	Insertion length
Ø d_1	Bore size
Ø D_1	Diameter of the sealing collar
Ø F_1	Protection tube outer diameter

Material	Dimensions in mm [in]											Weight in kg [lbs]	
	E	N	Ø d_1	Ø D_1	Ø F_1	H_1	H_2	K_1	S	S_1	SW	U_1 = 73 mm [2.87 in]	U_1 = 410 mm [16.14 in]
Stainless steel 1.4571	G ½ B	G ½	7 [0.28]	26 [1.02]	12 [0.47]	19 [0.75]	15 [0.59]	14 [0.55]	2.5 [0.1]	3.5 [0.15]	27 [1.06]	0.14 [0.31]	0.34 [0.75]
	G ½ B	G ½	9 [0.35]	26 [1.02]	14 [0.55]	19 [0.75]	15 [0.59]	14 [0.55]	2.5 [0.1]	3.5 [0.14]	27 [1.06]	0.14 [0.31]	0.37 [0.82]
	G ½ B	G ½	11 [0.43]	26 [1.02]	14 [0.55]	19 [0.75]	15 [0.59]	14 [0.55]	1.5 [0.06]	2.5 [0.1]	27 [1.06]	0.12 [0.26]	0.30 [0.66]
	G ½ B	G ½	6.2 [0.24]	26 [1.02]	8 [0.32]	19 [0.75]	15 [0.59]	14 [0.55]	0.9 [0.04]	1 [0.04]	27 [1.06]	0.13 [0.27]	0.20 [0.44]
	G ½ B	G ½	8.2 [0.32]	26 [1.02]	10 [0.39]	19 [0.75]	15 [0.59]	14 [0.55]	0.9 [0.04]	1 [0.04]	27 [1.06]	0.13 [0.27]	0.20 [0.44]
	G ½ B	G ½	10.2 [0.40]	26 [1.02]	12 [0.47]	19 [0.75]	15 [0.59]	14 [0.55]	0.9 [0.04]	1 [0.04]	27 [1.06]	0.11 [0.24]	0.18 [0.4]
	G ¾ B	G ½	7 [0.28]	32 [1.26]	12 [0.47]	19 [0.75]	15 [0.59]	16 [0.63]	2.5 [0.1]	3.5 [0.14]	32 [1.26]	0.22 [0.49]	0.43 [0.95]
	G ¾ B	G ½	9 [0.35]	32 [1.26]	14 [0.55]	19 [0.75]	15 [0.59]	16 [0.63]	2.5 [0.1]	3.5 [0.14]	32 [1.26]	0.22 [0.49]	0.46 [1.01]
	G ¾ B	G ½	11 [0.43]	32 [1.26]	14 [0.55]	19 [0.75]	15 [0.59]	16 [0.63]	1.5 [0.06]	2.5 [0.1]	32 [1.26]	0.20 [0.44]	0.39 [0.86]
	G ¾ B	G ½	6.2 [0.24]	32 [1.26]	8 [0.32]	19 [0.75]	15 [0.59]	16 [0.63]	0.9 [0.04]	1 [0.04]	32 [1.26]	0.21 [0.46]	0.28 [0.62]
	G ¾ B	G ½	8.2 [0.32]	32 [1.26]	10 [0.39]	19 [0.75]	15 [0.59]	16 [0.63]	0.9 [0.04]	1 [0.04]	32 [1.26]	0.21 [0.46]	0.28 [0.62]
	G ¾ B	G ½	10.2 [0.40]	32 [1.26]	12 [0.47]	19 [0.75]	15 [0.59]	16 [0.63]	0.9 [0.04]	1 [0.04]	32 [1.26]	0.20 [0.44]	0.27 [0.6]

Ordering information

Model / Protection tube form / Protection tube material / Process connection / Connection to thermometer / Insertion length U_1 / Dimension of pipe / Assembly with thermometer / Certificates / Options

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