

# Protection tube

## Version per EN 50446

### Model TW81

WIKA data sheet TW 95.81

#### Applications

- Blast furnaces, air heaters
- Heat treatment furnaces
- Waste incineration plants
- Major heating plants, heat generation

#### Special features

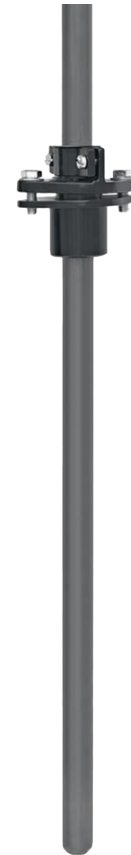
- Variable length and dimensions
- Large selection of materials
- Different process connections

#### Description

Each protection tube or thermowell is an important component of any temperature measuring point. 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 sensor 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 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 protection tubes, and those with flange connections.

The bottom of protection tube model TW81 is either flat or dished, in the case of enamelled protection tubes it is always dished. The protection tube is plugged into the connection head and compression fitted. Additionally, we offer the



**Protection tube model TW81 with stop flange per DIN 43734 inclusive mating flange**

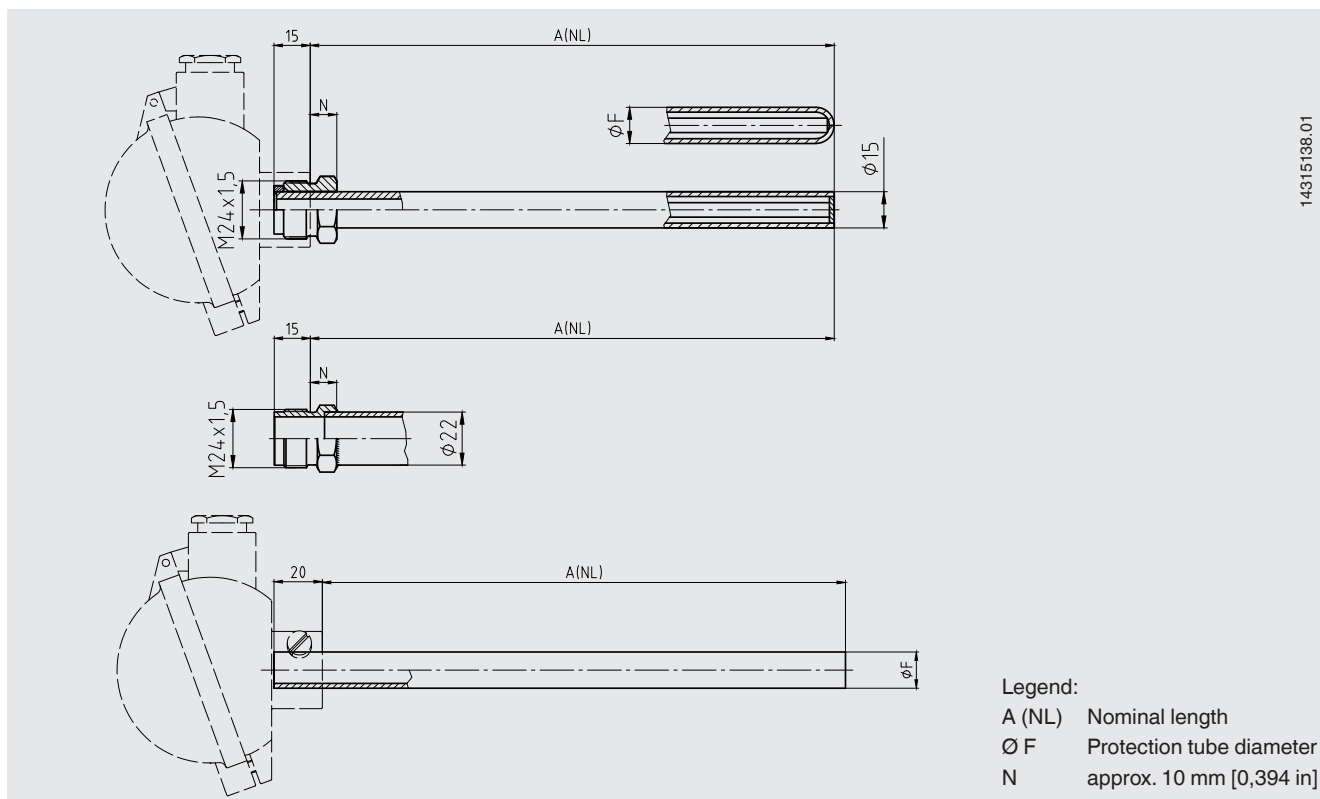
possibility of a connection head screwed at the protection tube. This allows an ingress protection IP65. A slideable process connection is compression fitted on the protection tube, thus allowing a variable insertion length.

Preference is to be given to standard nominal lengths per EN 50446.

## Specifications

Protection tube per EN 50446, model TW81	
<b>Standard nominal lengths A</b>	<ul style="list-style-type: none"> <li>■ 500 mm [19.685 in]</li> <li>■ 710 mm [27.952 in]</li> <li>■ 1,000 mm [39.370 in]</li> <li>■ 1,400 mm [55.118 in]</li> <li>■ 2,000 mm [78.740 in]</li> </ul> Others on request
<b>Materials</b>	<ul style="list-style-type: none"> <li>■ Carbon steel 1.0305 up to 550 °C [1,022 °F] (air), low corrosion resistance to sulphurous gases, medium corrosion resistance to nitrogenous gases</li> <li>■ Carbon steel 1.0305, enamelled up to 550 °C [1,022 °F], resistance to a max. applied pressure of 1 bar [14.504 psi], for the low pressure range in furnaces and flue gas ducts</li> <li>■ Stainless steel 1.4571 up to 700 °C [1,292 °F] (air), good corrosion resistance to aggressive media</li> <li>■ Stainless steel 1.4841 up to 1,150 °C [2,102 °F] (air), low corrosion resistance to sulphurous gases; high corrosion resistance to nitrogenous gases and gases with low oxygen content; high long-time rupture strength</li> <li>■ Stainless steel 1.4762 up to 1,200 °C [2,192 °F] (air), high corrosion resistance to sulphurous gases; low corrosion resistance to nitrogenous gases</li> </ul> Other materials on request

## Dimensions in mm [in]



Metal protection tube	
Outer diameter in mm [in]	Tube thickness in mm [in]
Ø F	s
22 [0.866 in]	2 [0.079 in]
15 [0.591 in]	2 [0.079 in]

## Process connection

### Not gas-tight

A stop flange is sufficient; a mating flange is not necessary. The stop flange slides onto the protection tube and is secured using a clamp. The insertion length of the thermometer is variable and can be easily adjusted at the mounting point.

### Gas-tight up to 1 bar [14.504 psi]

A threaded bushing or a combination stop flange/mating flange is required.

#### ■ Threaded bushing

This is secured onto the metal protection tube using a clamp. After loosening the clamp, the threaded bushing slides onto the protection tube. The insertion length of the thermometer is variable and can be easily adjusted at the mounting point.

#### ■ Stop flange/mating flange

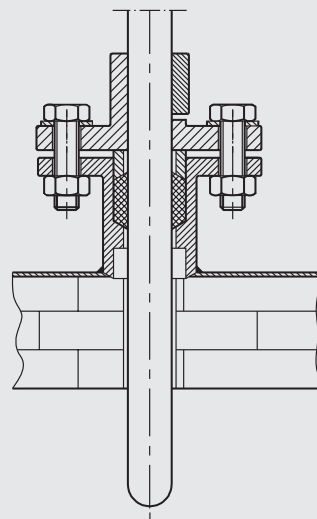
Sealing is made via a stuffing-box packing between mating flange and protection tube. The assembly is secured by clamping the stop flange and protection tube together. The insertion length of the thermometer is adjustable.

### Enamelled protection tube

When using enamelled protection tubes a threaded bushing should be used to prevent the enamelled surface layer from being damaged.

### Mounting example

Thermocouple with metal protection tube

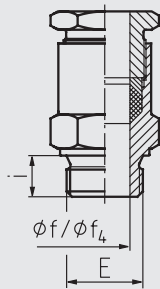


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### Threaded bushing

adjustable, gas-tight up to 1 bar [14.504 psi]  
Sealing: asbestos-free, up to max. 300 °C [572 °F]  
higher temperatures on request

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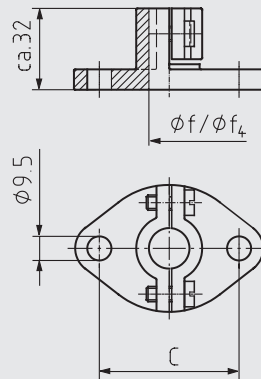


#### Material:

carbon steel or stainless steel 1.4571

### Stop flange per EN 50446

adjustable

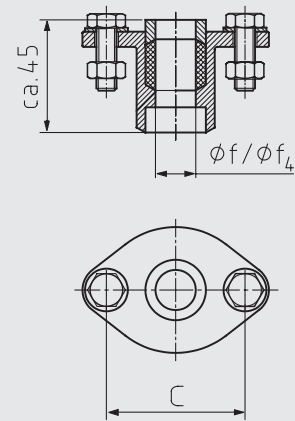


#### Material:

carbon steel or malleable cast iron  
others on request

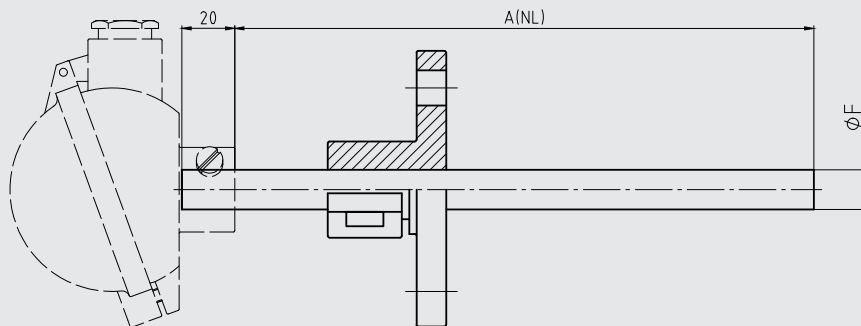
### Mating flange only applicable in conjunction with a stop flange

adjustable, gas-tight up to 1 bar [14.504 psi]  
Sealing: asbestos-free



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Mounting example: stop flange per EN 50446



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### Selectable threaded bushings

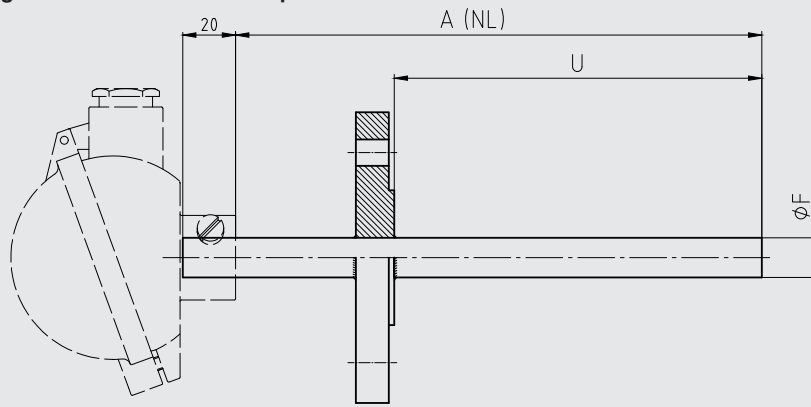
Protection tube outer diameter in mm [in]	Dimensions in mm [in]		Process connection
	$\phi f / \phi f_4$	i min.	
22 [0.866 in]	22.5 [0.886 in]	20 [0.787 in]	<ul style="list-style-type: none"> <li>■ G 1</li> <li>■ G 1½</li> </ul>
15 [0.591 in]	15.5 [0.610 in]	20 [0.787 in]	<ul style="list-style-type: none"> <li>■ G ½</li> <li>■ G ¾</li> <li>■ G 1</li> </ul>

Other threads on request

### Selectable stop flanges

Protection tube outer diameter in mm [in]	Dimensions in mm [in]	
	$\phi f / \phi f_4$	C (hole spacing)
22 [0.866 in]	22.5 [0.886 in]	70 [2.756 in]
15 [0.591 in]	15.5 [0.610 in]	55 [2.165 in]

### Flange connection with welded protection tube



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### Selectable flange sizes

Flange Ø	Material
1 ½ inch, 150 lbs, RF	Stainless steel 316
1 ½ inch, 300 lbs, RF	Stainless steel 316
2 inch, 150 lbs, RF	Stainless steel 316
2 inch, 300 lbs, RF	Stainless steel 316
3 inch, 150 lbs, RF	Stainless steel 316
3 inch, 300 lbs, RF	Stainless steel 316
4 inch, 150 lbs, RF	Stainless steel 316
4 inch, 300 lbs, RF	Stainless steel 316

Other flanges on request

### Ordering information

Model / Material / Protection tube diameter / Nominal length / Connection to thermometer / Process connection / Insertion length / Certificates / Options

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