

## General

The thermocouple or the resistance thermometer, are protected from mechanical and chemical influences by using protective fittings. With regard to temperature resistance, the requirements for resistance thermometer are as high as for thermocouples due to their naturally low maximum temperature. Moreover, in both the cases, the mechanical requirements that determine wall thickness, as well as the shape and as a result, the pressure and bending resistance, must be met.

### DESIGN OF PROTECTIVE FITTINGS MADE OF TUBE AND SOLID MATERIAL

Protective fittings made of tube and solid material must fulfil the following functions:

- **Positioning temperature-sensitive probe tip in the process**
- **Protection of the thermometer against mechanical and chemical influences**
- **Isolation of the processing area from the environment**

Malfunctioning of these components can result in operation interruptions, the release of combustible, explosive or poisonous substances, material damage and personal injuries. Hence, a careful risk and stress analysis is necessary.

Protective fittings are available in approved and standardised designs with different process connections. The two basic designs can be characterised as follows:

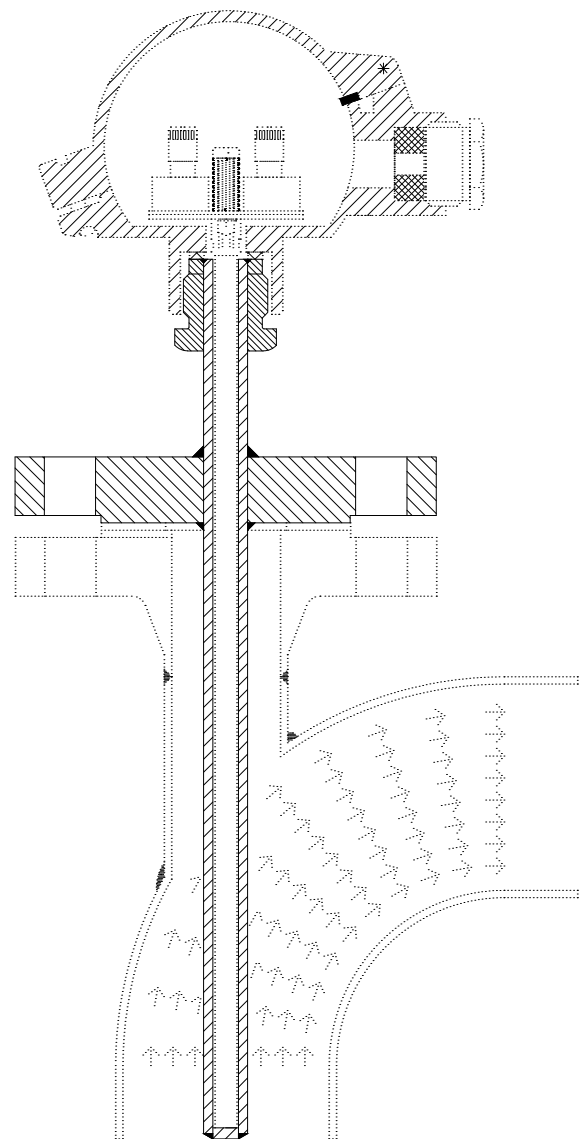
**Protective fittings made of raw material** comprised of welded tubes and connection parts and can be manufactured at a low cost, with varying degrees of length. However their mechanical durability is limited. Structural changes and heat influence zones at welding seams can negatively influence corrosion resistance.

**Protective fittings made of solid material** can be manufactured from massive rods by means of deep-hole drilling. Durable protective fittings with optimum material utilisation have a conical shape. Welding seams are not present in areas which are subject to high thermal loads.

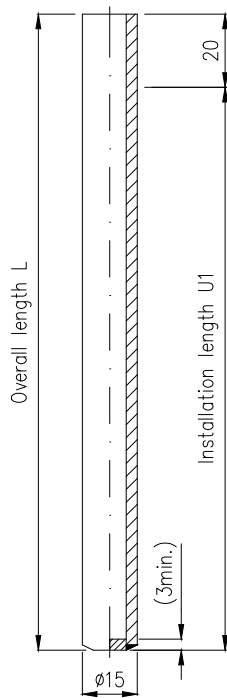
#### • Material-selection

In addition to design and dimensions, material selection is critically important. The material must be temperature- and corrosion-resistant in the operating medium. The possibility of unpredictable failure due to certain corrosion types (intergranular corrosion, stress corrosion) or material embrittlement, reduction in elongation and notch impact strength can be safely excluded. Erosion of the wall thickness due to surface corrosion or abrasion must be taken into account for each corresponding wall thickness supplement.

For the selection of the right material, it is recommended to use at least the material quality of the container / pipeline. For cost or production reasons, the protective tube can be used with a corresponding resistant casing made of, for example, ECTFE, TANTAL and an abrasion-resistant coating such as Stellite.



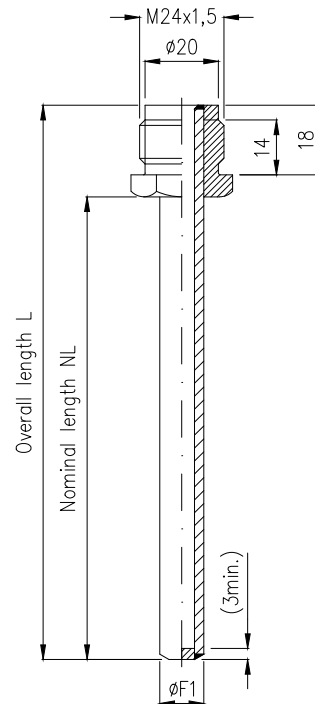
## SA10 Form 1 - DIN 43772 for Inserting



Installation length U1	Overall length L		
500 mm	517 mm	1	01
710 mm	727 mm	2	
1000 mm	1017 mm	3	
1400 mm	1417 mm	4	
2000 mm	2017 mm	5	
Please specify other version in plain text		S	
Thermowell	Material		
ø 15 x 2 mm	1.4571	1	02
ø 15 x 3 mm	1.4571	2	
ø 15 x 2 mm	1.4571-emailliert	3	
Please specify other version in plain text		S	
Acceptance Certificate			
Without		K	03
Material test certificate 3.1 – EN 10204		1	
Please specify other in plain text		S	

Article number SA10 .

## SA20 Form 2 - DIN 43772 for Inserting or for Welding



Nominal length NL	Overall length L		
280 mm	305 mm	1	01
370 mm	395 mm	2	
520 mm	545 mm	3	
Please specify other version in plain text		S	
Thermowell ØF1			
ø 9 x 1 mm		1	02
ø 11 x 2 mm		2	
ø 12 x 2,5 mm		3	
ø 14 x 2,5 mm		4	
Please specify other version in plain text		S	
Material			
1.4571		1	03
Please specify other version in plain text		S	
Acceptance Certificate			
Without		K	04
Material test certificate 3.1 – EN 10204		1	
Please specify other in plain text		S	

Item number SA20 .

**SA21**  
form 2G - DIN 43772  
for screwing in

ØE	ØD1	K1
G1/2"	26	17
G3/4"	32	19
G1"	39	21

Installation length U1	Overall length L		
160 mm	305 mm	1	01
250 mm	395 mm	2	
400 mm	545 mm	3	
Please specify other version in plain text		S	
<b>Thermowell ØF1</b>			
Ø 9 x 1 mm		1	02
Ø 11 x 2 mm		2	
Ø 12 x 2,5 mm		3	
Ø 14 x 2,5 mm		4	
Please specify other version in plain text		S	
<b>Process connector ØE</b>			
G1/2"		1	03
G3/4"		2	
G1"		3	
Please specify other version in plain text		S	
<b>Material</b>			
1.4571		1	04
Please specify other version in plain text		S	
<b>Acceptance Certificate</b>			
Without		K	05
Material test certificate 3.1 – EN 10204		1	
Please specify other in plain text		S	

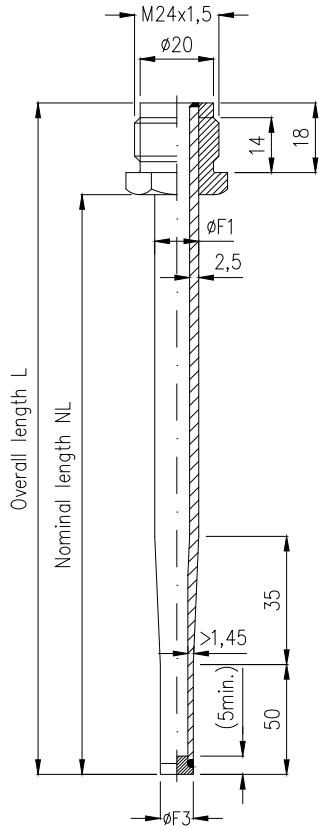
Article number SA21. 01 02 03 04 05

**SA22**  
form 2F - DIN 43772  
for flange mounting

Installation length U1	Overall length L		
225 mm	305 mm	1	01
315 mm	405 mm	2	
465 mm	545 mm	3	
Please specify other version in plain text		S	
<b>Thermowell ØF1</b>			
Ø 9 x 1 mm		1	02
Ø 11 x 2 mm		2	
Ø 12 x 2,5 mm		3	
Ø 14 x 2,5 mm		4	
Please specify other version in plain text		S	
<b>Flange</b>			
DN25/PN40 Form C bzw. Form B1		1	03
Please specify other version in plain text		S	
<b>Material</b>			
1.4571		1	04
Please specify other version in plain text		S	
<b>Acceptance Certificate</b>			
Without		K	05
Material test certificate 3.1 – EN 10204		1	
Please specify other in plain text		S	

Article number SA22. 01 02 03 04 05

**SA30**  
form 3 - DIN 43772  
for Inserting or for welding

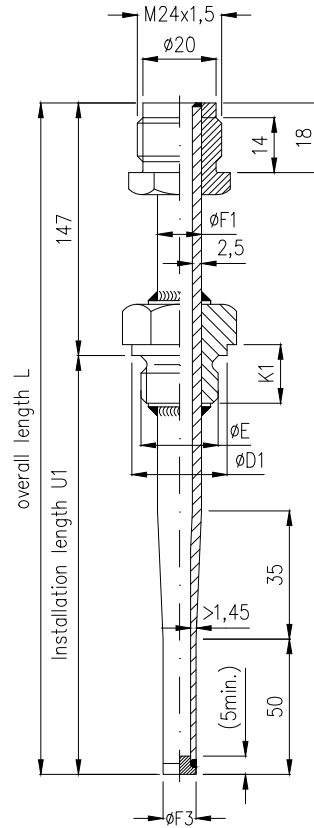


Nominal length NL	Overall length L		
282 mm	307 mm	1	01
342 mm	367 mm	2	
402 mm	427 mm	3	
Please specify other version in plain text		S	
Thermowell ØF1 / ØF3			
Ø12 x 2,5 mm / 9 mm		1	02
Ø14 x 2,5 mm / 11 mm		2	
Please specify other version in plain text		S	
Material			
1.4571		1	03
Please specify other version in plain text		S	
Acceptance Certificate			
Without		K	04
Material test certificate 3.1 – EN 10204		1	
Please specify other in plain text		S	

Article number SA30. 

01	02	03	04
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**SA31**  
form 3G - DIN 43772  
for screwing in



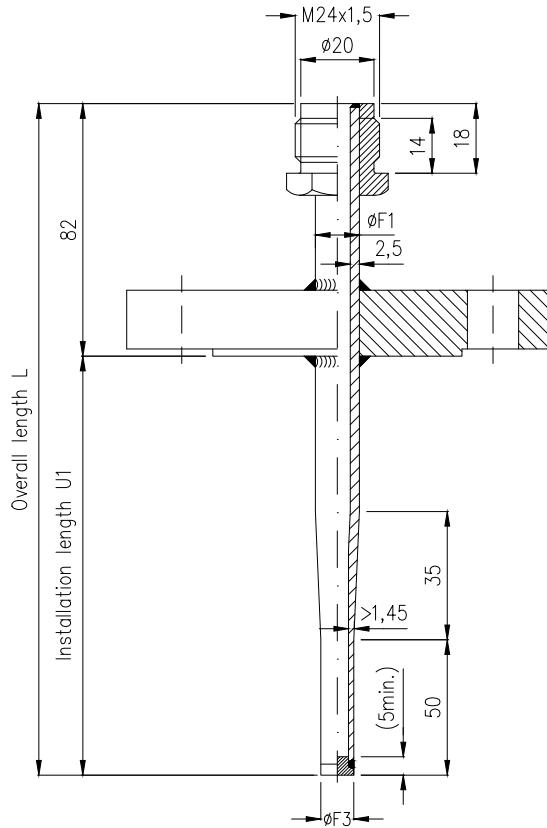
ØE	ØD1	K1
G1/2"	26	17
G3/4"	32	19
G1"	39	21

Installation length U1	Overall length L		
160 mm	307 mm	1	01
220 mm	367 mm	2	
280 mm	427 mm	3	
Please specify other version in plain text		S	
Thermowell ØF1 / ØF3			
Ø12 x 2,5 mm / 9 mm		1	02
Ø14 x 2,5 mm / 11 mm		2	
Please specify other version in plain text		S	
Process connection ØE			
G1/2"		1	03
G3/4"		2	
G1"		3	
Please specify other version in plain text		S	
Material			
1.4571		1	04
Please specify other version in plain text		S	
Acceptance Certificate			
Without		K	05
Material test certificate 3.1 – EN 10204		1	
Please specify other in plain text		S	

Article number SA31. 

01	02	03	04	05
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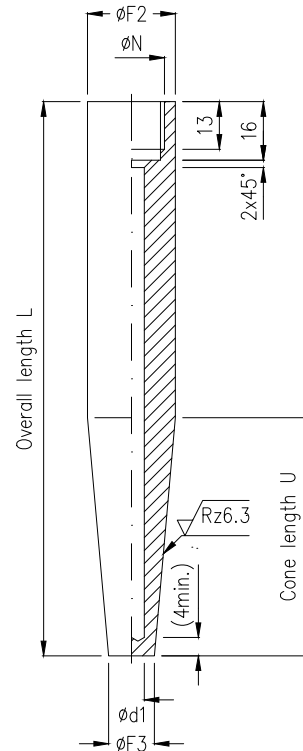
## SA32 Form 3F - DIN 43772 for flange mounting



Installation length U1	Overall length L		
225 mm	307 mm	1	01
285 mm	367 mm	2	
345 mm	427 mm	3	
Please specify other version in plain text		S	
Thermowell ØF1 / ØF3			
Ø 12 x 2,5 mm / Ø 9 mm		1	02
Ø 14 x 2,5 mm / Ø 11 mm		2	
Please specify other version in plain text		S	
Flange			
DN25/PN40 Form C resp. Form B1		1	03
Please specify other version in plain text		S	
Material			
1.4571		1	04
Please state other version in clear text		S	
Acceptance Certificate			
Without		K	05
Material test certificate 3.1 – EN 10204		1	
Please specify other in plain text		S	

Article number SA32 .  01  02  03  04  05

## SA40 Form 4 - DIN 43772 for welding



Overall length L	Cone length U		
110 mm	65 mm	1	01
140 mm	65 mm	2	
170 mm	133 mm	3	
200 mm	65 mm	4	
200 mm	125 mm	5	
260 mm	125 mm	6	
Please specify other version in plain text		S	
ØN	Ød1	ØF2 / ØF3	
M14 x 1,5	3,5 mm	18 h7 mm / 9 mm	1
M18 x 1,5	7 mm	24 h7 mm / 12,5 mm	2
Please specify other version in plain text		S	02
Material			
1.4571		1	03
1.4404		2	
1.0460		3	
1.5415		4	
Please specify other version in plain text		S	
Acceptance Certificate			
Without		K	04
Material test certificate 3.1 – EN 10204		1	
Please specify other in plain text		S	

Article number SA40 .  01  02  03  04

### SA41 Form 4F - DIN 43772 for flange mounting

\*1 :: Not for Ød1 3,5 mm::

Overall length L	Cone length U	Installation length U1		
200 mm	65 mm	130 mm	1	01
260 mm	125 mm	190 mm	2	
410 mm	275 mm	340 mm *1	3	
Please specify other version in plain text			S	
ØN	Ød1	ØF2 / ØF3		
M14 x 1,5	3,5 mm	18 h7 mm / 9 mm	1	02
M18 x 1,5	7 mm	24 h7 mm / 12,5 mm	2	
Please specify other version in plain text			S	
Flange				
DN25/PN40 Form C bzw. B1			1	03
DN40/PN40 Form C bzw. B1			2	
DN50/PN40 Form C bzw. B1			3	
Andere Ausführung bitte im Klartext angeben			S	
Material				
1.4571			1	04
1.4404			2	
1.0460			3	
1.7380			4	
Please specify other version in plain text			S	
Acceptance certificate				
Without			K	05
Material test certificate 3.1 – EN 10204			1	
Please specify other in plain text			S	

Article number **SA41.**

### SALN LN446 - Company standard for welding

Overall length L1		
175 mm	1	01
265 mm	2	
415 mm	3	
Please specify other version in plain text		S
Drilling Ød1	Ball ØF3	
7 mm	14 mm	1
9 mm	16 mm	2
13 mm	21 mm	3
Material		
1.4571		1
1.4462		2
1.0460		3
Please specify other version in plain text		S
Acceptance certificate		
Without		K
Material test certificate 3.1 – EN 10204		1
Please specify other in plain text		S

Article number **SALN.**

### SAVZ VZ 7200 - Company standard for welding

Overall length L		01
395 mm	1	
515 mm	2	
Please specify other version in plain text	S	
Material		02
1.4571	1	
1.4541	2	
1.0460	3	
Please specify other version in plain text		S
Acceptance certificate		03
Without	K	
Material test certificate 3.1 – EN 10204	1	
Please specify other in plain text	S	

Article number SAVZ . 01 02 03

### SABR BR 63-110 for flange mounting

Overall length L		Installation length U1		01
258 mm		213 mm	1	
308 mm		263 mm	2	
508 mm		463 mm	3	
Please specify other version in plain text			S	
Flange		02		
DN50/PN40 B1	1			
DN50/PN63 B2	2			
Please specify other version in plain text	S			
Material		03		
1.4571	1			
1.4539	2			
Please specify other version in plain text	S			
Acceptance certificate		04		
Without	K			
Material test certificate 3.1 – EN 10204	1			
Please specify other in plain text	S			

Article number SABR . 01 02 03 04