

Product group electric thermometers (TE)

Claus plant thermometer series: TFC



Areas of application:

- Claus combustion chambers
- Sulphur-containing flue gases

Features:

- acid gas resistant
- robust

Approvals:

- optional ATEX

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1. General information

The hydrogen sulfide (sour gas) produced in petroleum or natural gas refineries is often processed into elemental sulfur in plants named after their inventor, "Claus." Sour gas and hydrogen have the ability to diffuse through gas-tight protective tube materials at high temperatures.

These substances damage precious metal thermocouples.

The temperature assemblies in this series protect the thermocouples with protective gas. Nitrogen is generally used for this purpose. Protection can be provided by static internal pressure or, better still, by a flushing circuit.

The preferred thermocouple material is type B (Pt30Rh-Pt6Rh). The high rhodium content in both thermocouple legs results in better corrosion resistance.

The disadvantage is a high measuring range start at approx. 400 °C.

When using a purging system, thermocouples S (Pt10Rh-Pt) and R (Pt13Rh-Pt) can of course also be used.

2. Type series

Depending on the rinse used, we have the following types in our program:

- TFC41 - with protective gas atmosphere through static internal pressure
- TFC42 - Protection of the thermocouple(s) by flushing circuit

3. Basic structure

Basic properties are described in our product data sheet 1113.01 - Thermocouples for industrial furnaces. This data sheet only deals with design-specific features.

All A-type connection heads can be used. Double elements with 2 transducers are possible by using a rim housing instead of a connection head.

Only high-purity aluminum oxide C799 can be used as the protective tube material. For a second outer protective tube, silicon carbide has proven to be very robust.

4. Process connections

These devices are exclusively flanged. Due to their design, the flange size must be at least DN40 or 1 1/2". The preferred flange sizes are DN50 or 2".

5. Additional equipment

If there is no purge connection on the flange nozzle of the combustion chamber, one can also be integrated into the process connection flange.

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6. Type descriptions

6.1 Type TFC41 - Thermocouple fitting with static internal pressure

The thermocouple is protected by a stationary protective gas atmosphere, preferably nitrogen. This can gradually become contaminated through diffusion processes.

Therefore, only relatively corrosion-resistant type B thermocouples can be used for this design. The protective tube is made of gas-tight, high-purity aluminium oxide type C799 and should have a diameter of at least 15 mm. If an additional outer protective tube is used, the diameter may be smaller.

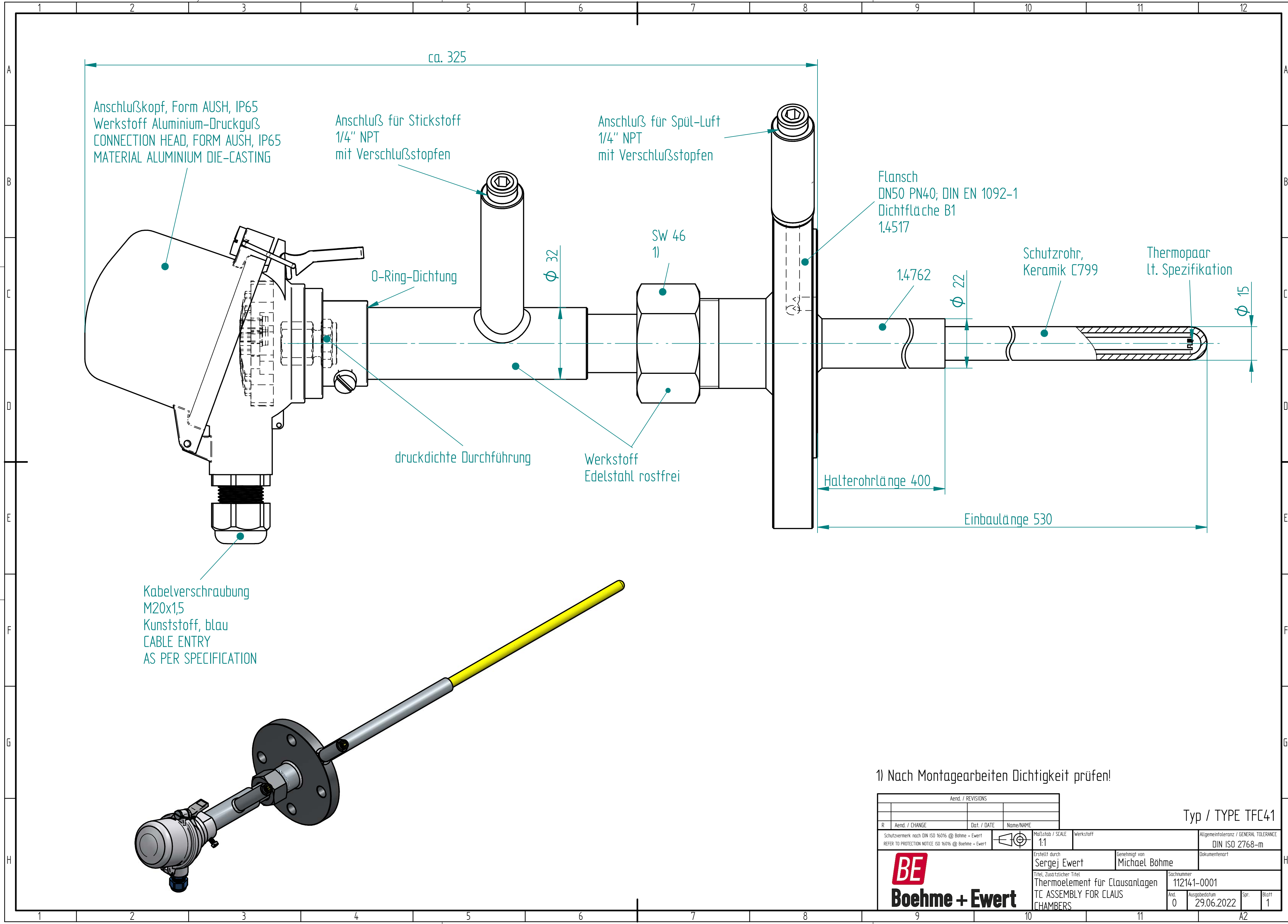
6.2. Type TFC42 - Thermometer fitting with flushing circuit

Permanent purging reliably protects the thermocouple from sour gas. This enables the use of thermocouples with a pure platinum leg, types R and S. These may be required for SIL measurement circuits in conjunction with transducers. The purge gas flows through the insulating rod capillaries to the hot end and back again around the outside of the protective tube.

With regard to the protective tube itself, the information provided in section 6.1 applies.

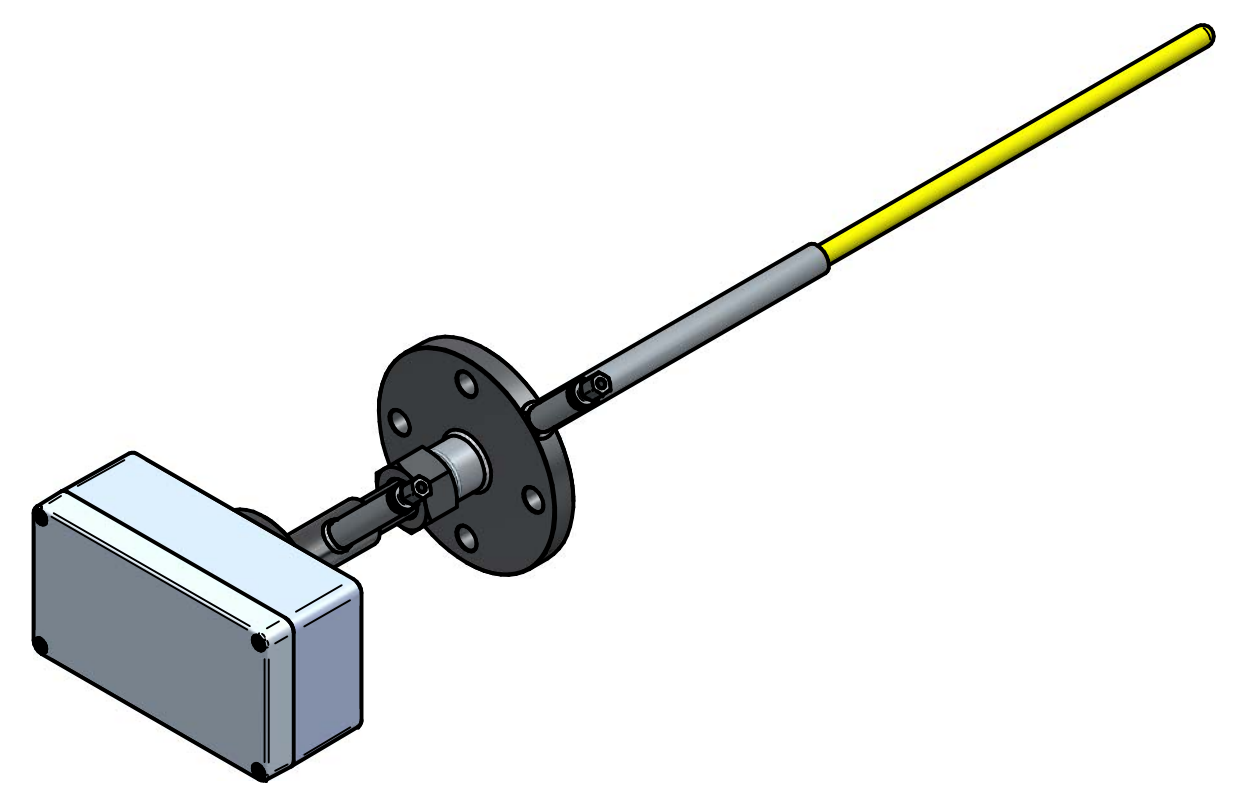
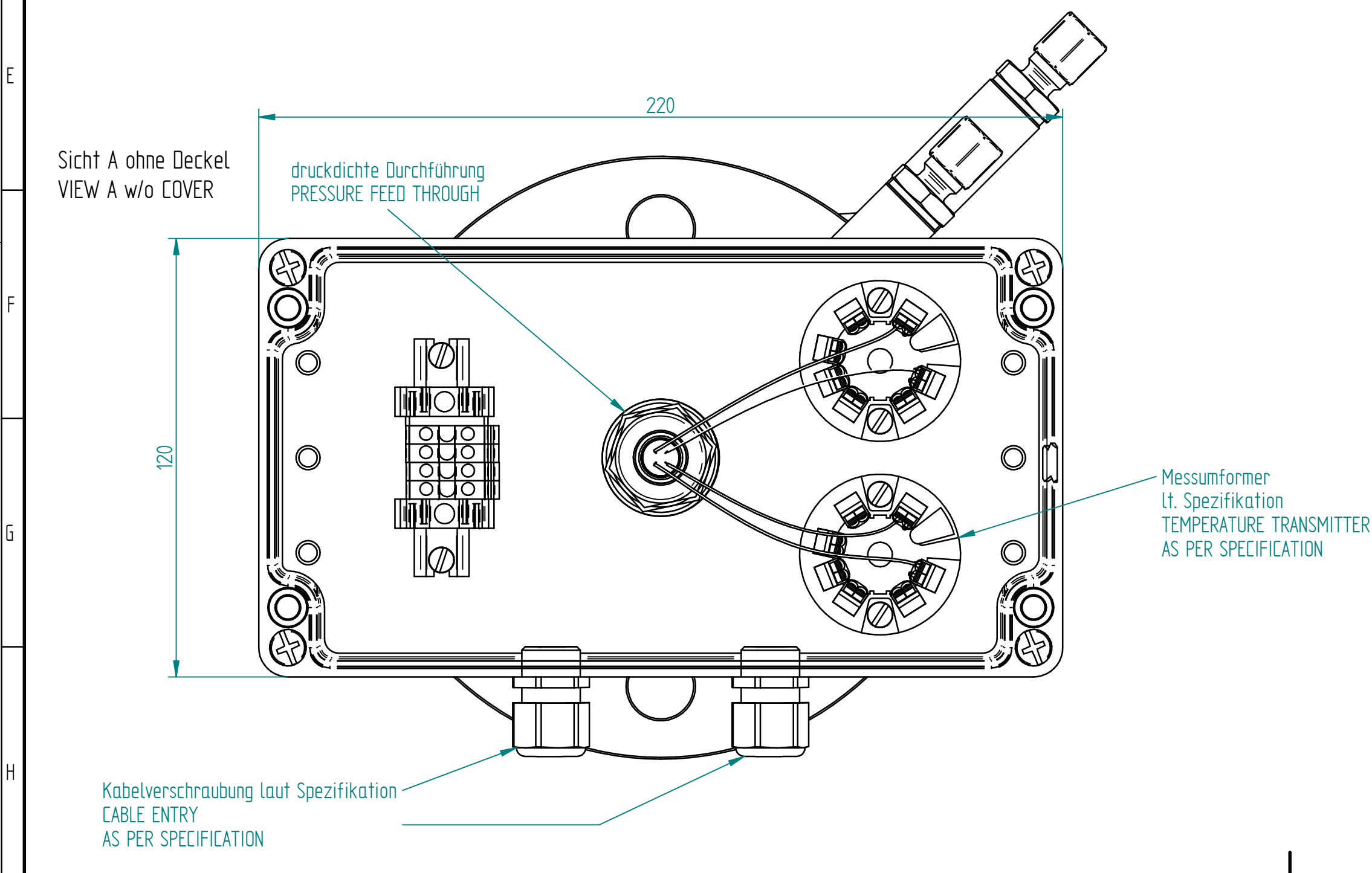
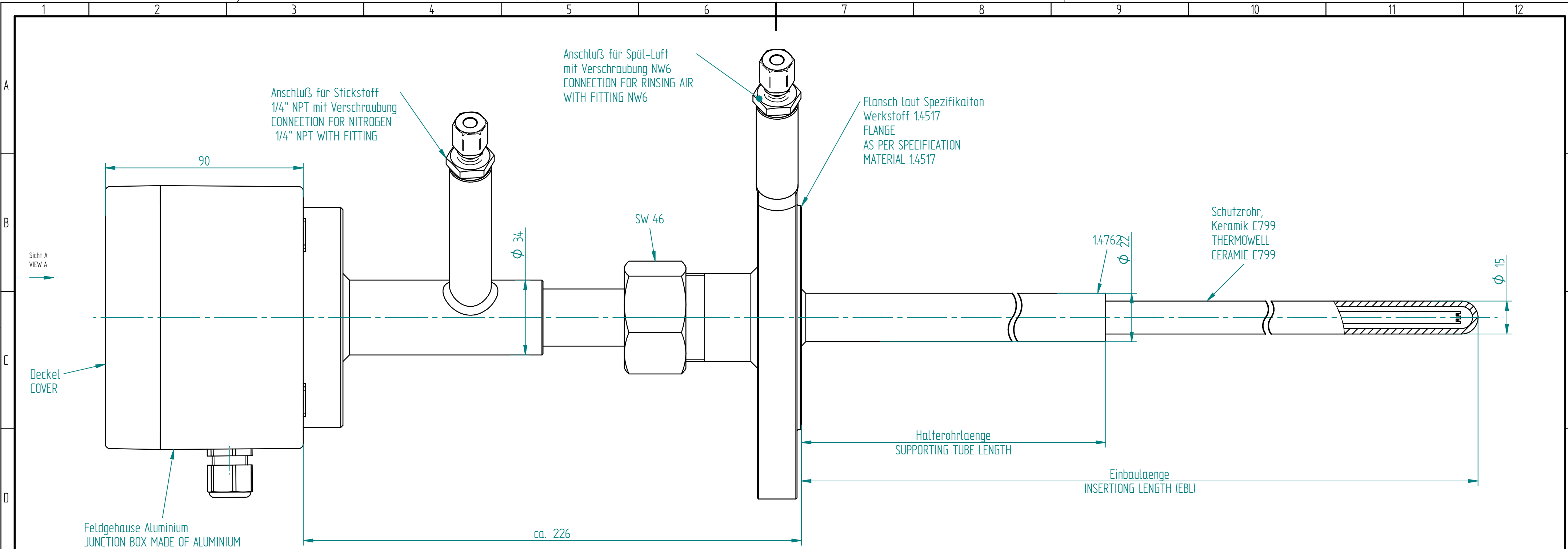
6.3 The appendix shows examples that have been realized and proven in use

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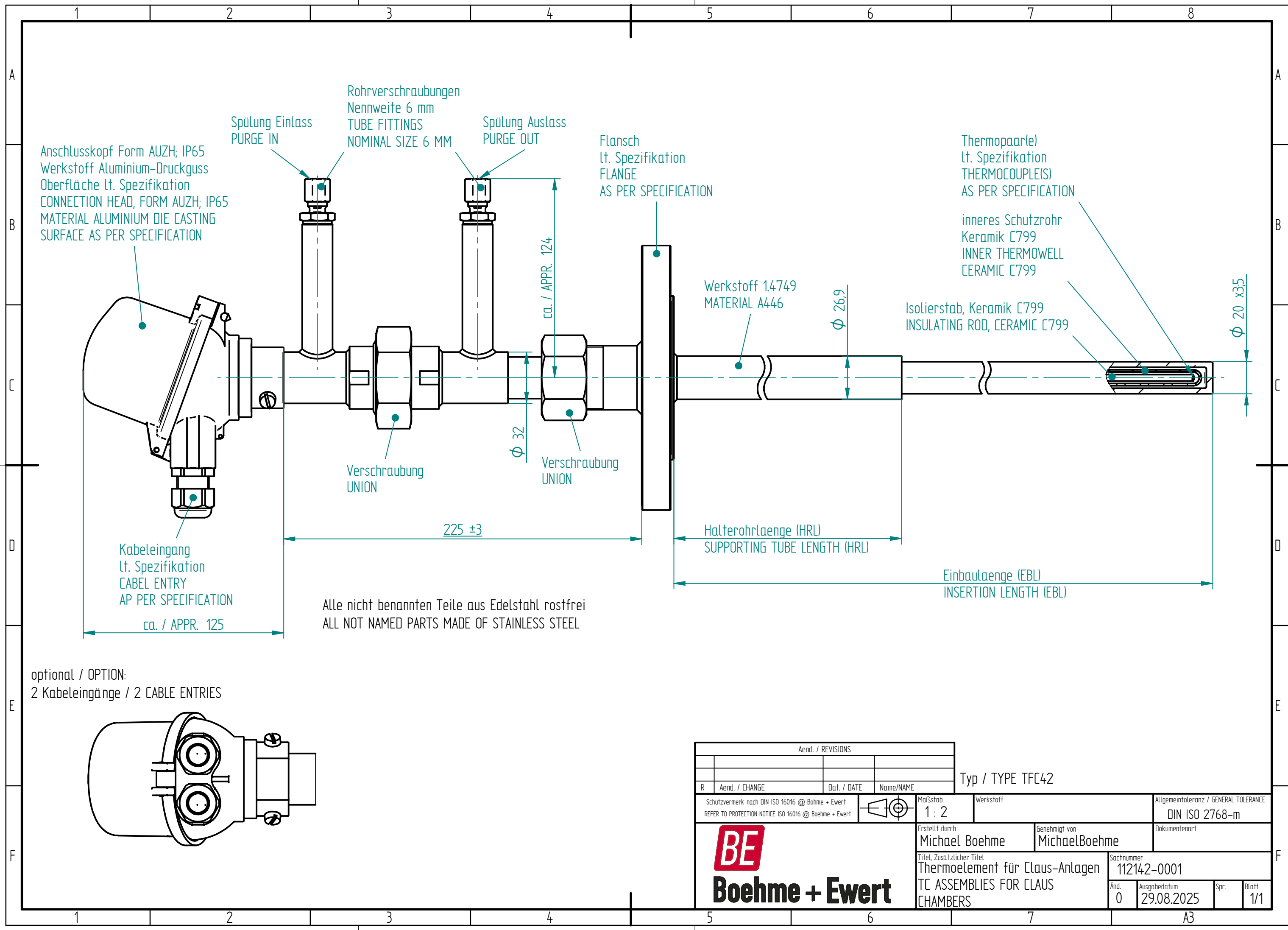


1) Nach Montagearbeiten Dichtigkeit prüfen!

Änd. / REVISIONS				Typ / TYPE TFC41			
R	Änd. / CHANGE	Dat. / DATE	Name/NAME				
Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert REFER TO PROTECTION NOTICE ISO 16016 @ Böhme + Ewert				Maßstab / SCALE 1:1	Werkstoff	Allgemeintoleranz / GENERAL TOLERANCE DIN ISO 2768-m	
 Boehme + Ewert				Erstellt durch Sergej Ewert	Genehmigt von Michael Böhme	Sachnummer 112141-0001	
				Titel, Zusätzlicher Titel Thermoelement für Clausanlagen TC ASSEMBLY FOR CLAUS CHAMBERS		Änd. 0	Blatt 1
				Ausgabedatum 29.06.2022		Spr. 1	



Änd. / REVISIONS					
R	Änd. / CHANGE	Dat. / DATE	Name/NAME		
Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert REFER TO PROTECTION NOTICE ISO 16016 @ Böhme + Ewert				Maßstab / SCALE 1:1	Werkstoff
BE Boehme + Ewert				Erstellt durch Sergej Ewert	Genehmigt von Michael Böhme
Titel, Zusätzlicher Titel Thermoelement für Clausanlagen Typ TFC41 TC ASSEMBLY FOR CLAUS CHAMBERS TYP TFC41				Sachnummer 112141-0002	Dokumentenart Fehler: Keine Referenz
				Änd. 0	Ausgabedatum 04.11.2022
				Spr. 1	Blatt 1



Änd. / REVISIONS				Typ / TYPE TFC42			
R	Änd. / CHANGE	Dat. / DATE	Name/NAME	Maßstab	Werkstoff	Allgemeintoleranz / GENERAL TOLERANCE	
				1 : 2		DIN ISO 2768-m	
Schutzvermerk nach DIN ISO 16016 @ Boehme + Ewert REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert				Erstellt durch Michael Boehme	Genehmigt von MichaelBoehme	Dokumententart	
				Titel, Zusätzlicher Titel Thermoelement für Claus-Anlagen TC ASSEMBLIES FOR CLAU CHAMBERS		Sachnummer 112142-0001	
				Änd. 0	Ausgabedatum 29.08.2025	Spr.	Blatt 1/1

Anschlußkopf Form AUZH; IP65
Werkstoff Aluminium-Druckguß
Oberfläche lt. Angabe
CONNECTION HEAD FORM AUZH; IP65
MATERIAL ALUMINIUM DIE CASTING
PAINTING AS PER SPECIFICATION

Messumformer lt. Spezifikation
TRANSMITTER AS PER SPECIFICATION

druckdichte Durchführung
PRESSURE TIGHT FEED THROUGH

Spülgas Eintritt
PURGE GAS INLET

Rohrverschraubung (Swagelok)
Nennweite 6 mm
Werkstoff 1.4401
TUBE CONNECTOR (SWAGelok)
NOMINAL SIZE 6 MM
MATERIAL A316

Flansch lt. Spezifikation
FLANGE AS PER SPECIFICATION

Thermostecker Mini
THERMOCOUPLE CONNECTOR MINI

Klingersildichtung M 40x1,5

Spülgas Austritt
PURGE GAS OUTLET

Graphitpackung ca. 30-40mm
PACKING GLAND, GRAPHITE APPR. 30-40mm

Isolierstab, $\varnothing 8,5$ mm
Keramik C799
ISOLATION ROD, $\varnothing 8.5$ MM
CERAMIC C799

Thermopaar
lt. Spezifikation
THERMOCOUPLE
AS PER SPECIFICATION

Kabeleingang lt. Spezifikation
CABLE ENTRY AS PER SPECIFICATION

Halsrohrlänge (HRL)
EXTENSION TUBE LENGTH (HRL)

Halterohrlänge (HRL)
SUPPORTING TUBE LENGTH (HRL)

Einbaulänge (EBL)
INSERTION LENGTH (EBL)



Änd. / REVISIONS				Typ / TYPE TFC42			
R	Änd. / CHANGE	Dat. / DATE	Name/NAME	 Maßstab 1:1	Werkstoff	Allgemeintoleranz / GENERAL TOLERANCE DIN ISO 2768-m	
Schutzvermerk nach DIN ISO 16016 © Bohme + Ewert REFER TO PROTECTION NOTICE ISO 16016 © Bohme + Ewert							
 Boehme + Ewert				Erstellt durch Michael Boehme		Geprüft von Sergej Ewert	
				Therm. Zusätzliche Titel Clausanlagen-Thermoelement TC-ASSEMBLY FOR CLAUS CHAMBERS		Dokumententwurf	
				Seriennummer 112142-0002			
				Ausgabedatum 2022-11-22		Exp. 2/1	

Sicht A
VIEW A

Deckel
COVER

Feldgehäuse Aluminium
JUNCTION BOX MADE OF ALUMINUM

Kabeleingang lt. Spezifikation
CABLE ENTRY AS PER SPECIFICATION

Thermostecker Mini Duplex
THERMOCOUPLE CONNECTOR MINI
DUPLEX

M 40x1,5

Flansch lt. Spezifikation
FLANGE AS PER SPECIFICATION

Graphitpackung
PACKING GLAND, GRAPHITE

Isolierstab, $\phi 8,5$ mm
Keramik C799
ISOLATION ROD, $\phi 8.5$ MM
CERAMIC C799

Thermopaar
lt. Spezifikation
THERMOCOUPLE
AS PER SPECIFICATION

Rohrverschraubung (Swagelok)
Nennweite 6 mm
Werkstoff 1.4401
TUBE CONNECTOR (SWAGelok)
NOMINAL SIZE 6 MM
MATERIAL A316

Spülgas Eintritt
PURGE GAS INLET

Spülgas Austritt
PURGE GAS OUTLET

HalterohrLaenge (HRL)
SUPPORTING TUBE LENGTH (HRL)

HalsrohrLaenge (HRL)
EXTENSION TUBE LENGTH (HRL)

Einbaulaenge (EBL)
INSERTIONG LENGTH (EBL)

Sicht A ohne Deckel
VIEW A w/o COVER

druckdichte Durchführung
PRESSURE TIGHT FEED THROUGH

Messumformer lt. Spezifikation
TRANSMITTER AS PER SPECIFICATION

TYP / TYPE TFC 42

R		Änd. / CHANGE	Dat. / DATE	Name/NAME	Maßstab		Werkstoff	Allgemeintoleranz / GENERAL TOLERANCE	
Schutzvermerk nach DIN ISO 16016 @ Bohme + Ewert		REFER TO PROTECTION NOTICE ISO 16016 @ Bohme + Ewert			1:1			DIN ISO 2768-m	
Erstellt durch		Gezeichnet von		Dokumententwurf		Sergej Ewert		Michael Bohme	
Titel, Zusatzlicher Titel		Zeichnungsnummer		Ausgabedatum		Blatt		6/1	
Clausenlagen-Thermoelement		112142-0003		2022-11-22					
TC-ASSEMBLY FOR CLAUS									
CHAMBERS									

BE
Boehme + Ewert