Boehme + Ewert
EXPERT TEMPERATURE SOLUTIONS

Product group electric thermometers (TE)

Modular Thermometer Series: TEM

Areas of application:

– chemistry and petrochemistry
– general process engineering
– energy technology
– environmental engineering
– mechanical and plant engineering

Features

– modular design
– robust for high temperatures and process pressures
– universally applicable

Approvals:

– ATEX
– optional IECEx

Modular thermometer series: TEM

Content:

Modular thermometer series: TEM

Type series: TEM110; TEM111; TEM120;
TEM121; TEM210; TEM220;
TEM31; TEM32

1. General information

This product group enables the individual modules to be combined selectively:

- Thermowell / Thermowell pocket
- Measuring insert
- Neck tube
- Connection head
- Temperature transmitter

An optimised configuration of an electrical thermometer for specific applications or measuring tasks.
Depending on the choice of sensor and thermowell, measuring ranges from -200 to 1100 °C,
with fast response, extremely robust capabilities to withstand harsh process conditions.

This system allows the sensor element (measuring insert) to be replaced during operation.
The main application is temperature measurement in pipes and containers.
Helpful information and recommendations on the advantageous/correct installation
of electrical thermometers can be found in VDE-VDI guideline 3522.

The type code is derived from the design of the protective sleeve/protective tube,
the measuring insert and whether a separate, removable neck tube is present:

a) Neck tube

- Without removable neck tube, definition "one-piece"
  Type series TEM1x
- With detachable neck tube, definition "multi-piece"
  Type series TEM2x

b) Design of the protection tube

- Tube construction, TEM1x series
- Made from solid material, TEM2x series

The resulting type combinations are as follows:

1.1 One-piece thermometers:

TEM110 - one-piece thermometer with thermowell made of tube and
with neck tube section
TEM111 - one-piece thermometer with thermowell made of tube and without neck tube section
neck tube section (compact version)
TEM120 - one-piece thermometer with solid thermowell and
with neck tube section
TEM121 - one-piece thermometer with solid thermowell without neck tube section
neck tube section (compact version)

1.2 Multi-part thermometers

TEM210 - multi-part thermometer with thermowell made of tube
TEM220 - multi-part thermometer with bar stock drilled thermowell

Modular thermometer series: TEM

1.3 Thermometer assemblies

TEM31 - Module assembly, consisting of connection head and measuring insert
TEM32 - Module assembly, consisting of connection head, measuring insert and neck tube

The TEM31 and TEM32 series are designed to become a complete thermometer
by mounting it on an existing thermowell protection tube to form a complete thermometer.
This is usually the responsibility of the customer. They are therefore only regarded as subordinate thermometer assemblies.
This category also includes the so-called "Van Stone" arrangements,
in which a loose thermowell is mounted pressure-tight to the process by means of a clamping flange.
Enamelled thermowells are also often mounted according to this principle.

The areas of application for this thermometer system are:

- Chemical industry
- Petrochemical industry
- Energy industry
- Environmental technology
- Cryogenic plants
- Oil and gas production plants
- Network systems
- Food and beverage industries

Possible authorisations and certificates:

- Explosion protection according to ATEX, IECEx or EAC (TR CU)
- Ex i according to Namur recommendation NE24
- SIL certificates
- DIN 14597 (heat generating systems)

Tests and test results

In order to meet the increased quality requirements of the application/process, the devices can be supplied with test and inspection certificates. Böhme + Ewert offers the following testsand certificates according to DIN EN 10204:

a) general:
Works certificate 2.1
Inspection certificate 3.1 for:
- Visual, dimensional and functional test

b) measurement use
Inspection certificate 3.1 for:
- Comparison measurement (factory calibration)
- DAkkS calibration via an accredited partner laboratory
- Pre test certificate for certification by board of weight and measurement (PT100 only)

c) thermowell
Inspection certificate 3.1 for:
- Materials (material monitoring)
- Pressure test
- Dye penetration test on the weld seams
- X-ray inspection of the weld seams
- Helium leak test

On request, certain tests can also be certified in accordance with DIN EN 10204 3.2.

2. The module components

2.1 Measuring inserts

The measuring inserts comply with DIN 43635, but can also deviate from it in individual parameters for special applications.They are made of sheathed cable and are therefore robust and bendable (although this property is not required in the TEM series). The resistance thermometer measuring inserts are mainly used with sensor elements according to DIN EN 60751 with resistance values PT100 or PT1000 are used.
Sensor elements according to other standards such as JIS or also with nickel measuring resistors can be supplied.
Furthermore, different temperature-sensitive lengths are possible: Standard, short and floor-sensitive.
For particularly harsh process conditions highly vibration-resistant versions are available.
The specification depends on the measuring task and the thermometer protection tube used.

2.1.1 Overview of the types of measuring inserts

BMM330 - with transmitter

BMM130 - with terminal block

2.1.2 Resistance thermometer measuring inserts

The selection of a suitable measuring resistor essentially depends on the operating temperature and the required mechanical properties. Film measuring resistors and measuring resistors with a platinum wire coil and ceramic body are used. Film measuring resistors are less expensive and allow shorter temperature-sensitive lengths. PT1000 measuring resistors are almost exclusively designed as film measuring resistors. Wire-ceramic measuring resistors enable extended temperature measuring ranges and are mechanically more robust and also have increased long-term stability.

An overview of types and recommended measuring ranges is given in the table on the following page. The measuring resistors comply with the IEC-based standard DIN EN 60751. Resistance thermometers to other international standards such as JIS C1604 or ASTM E1137 can be supplied on request can be supplied on request. All variants of the measuring inserts used in the TEM series fulfil the minimum requirement of 3 g in accordance with DIN EN 60751. The highly vibration-resistant version achieves values of at least 20 g.

Modular thermometer series: TEM

Overview of measuring resistors

Type of construction	Temperature range	PT10	PT100	PT1000
Layermeasuring resistance	-50 ... 400 °C (Standard)		●	●
	-50 ... 600 °C (extended)		●	●
	-200 ... +150 °C (cryo)		●	
Wire ceramics	-200 ... 600 °C (Standard)	●	●	
	-200 ... 800 °C (high temperature)	●	●	

Tolerance classes according to DIN EN 60751 and specific to Böhme + Ewert GmbH:
(apply within a sub-range of the temperature range, the validity range)

Class	Scope of validity (°C)		Limit deviation (K) *1)	DIN EN	B+E - specific
	Sheet resistance	Wire-ceramic measuring resistor			
AA	0 ... 150	-50 ... 250	±(0,1 + 0,0017|t|)	●	
A	-30 ... 300	-100 ... 450	±(0,15 + 0,002|t|)	●	
B	-50 ... 500	-196 ... 600	±(0,3 + 0,005|t|)	●	
C	-50 ... 600	-196 ... 600	±(0,6 + 0,005|t|)	●	
AC	-	-196 ... 200	±(0,15 + 0,002|t|)		●
BH	-	0 ... 800	±(0,3 + 0,005|t|)		●

Possible combinations of the number of measuring circuits and circuits depend on the diameter of themeasuring insert. With single measuring circuits, all circuit types are possible for all diameters.are possible for all diameters. It should be noted that only tolerance classes B and C are recommended for two-wire circuits.are recommended. The following dependency exists for multiple measuring circuits:

Diameter (mm)	2 Measuring circuits			3 Measuring circuits	
	2 - weir	3 - weir	4 - weir	2 - weir	3 - weir
3 - 4,5	●	●			
6 - 6,4	●	●	●	●	●
8	●	●	●	●	●

Modular thermometer series: TEM

2.1.3 Thermocouple measuring inserts

The thermocouples comply with the IEC-based standard DIN EN 60584.other international standards such as JIS C 1602 or ASTM E230 can also be supplied. Furthermore, a limited selection is also available in accordance with the German standard DIN 43710 is also available.
Thermocouples can be electrically insulated or connected to the sheath to improve the response time.
In practice, insulated measuring inserts are mainly used. The sheath material depends on the thermocouple used and the maximum temperature dependent on it. maximum temperature.
The following table provides an overview:

Thermocouple	Maximum operating temperature (°C) (tolerance range according to standard)	Sheath material
E J (L) T (U)	900 750 350	1.4571, 1.4541, 1.4404
K N B R S	1200 1200 1600 1600 1600	2.4816

Other sheath materials can also be used on request (e.g. Pyrosil-D for type N).
Detailed information on measuring inserts can be found in our catalogue sheet 2101.01.

Modular thermometer series: TEM

Tolerance values for thermocouples acc. IEC 60584-1

CLASS 1

Type	Temperature Range	Tolerance values
E	-40 to 375 °C 375 to 800 °C	±1,5 °C ±0,004 (t)
T	-40 to 125 °C 125 to 350 °C	±0,5 °C ±0,004 (t)
J	-40 to 375 °C 375 to 750 °C	±1,5 °C ±0,004 (t)
K/N	-40 to 375 °C 375 to 1000 °C	±1,5 °C ±0,004 (t)
R/S	0 to 1100 °C 1100 to 1600 °C	±1,0 °C ±[1+0,003(t-1100)

CLASS 2

Type	Temperature Range	Tolerance values
E	-40 to 375 °C 375 to 800 °C	±2,5 °C ±0,0075 (t)
T	-40 to 125 °C 1255 to 350 °C	±1 °C ±0,0075 (t)
J	-40 to 375 °C 375 to 750 °C	±2,5 °C ±0,0075 (t)
K/N	-40 to 375 °C 375 to 1000 °C	±2,5 °C ±0,0075 (t)
R/S	0 to 1100 °C 1100 to 1600 °C	±1,5 °C ±[1+0,003(t-1100)
B	600 to 1700 °C	±0,0025(t)

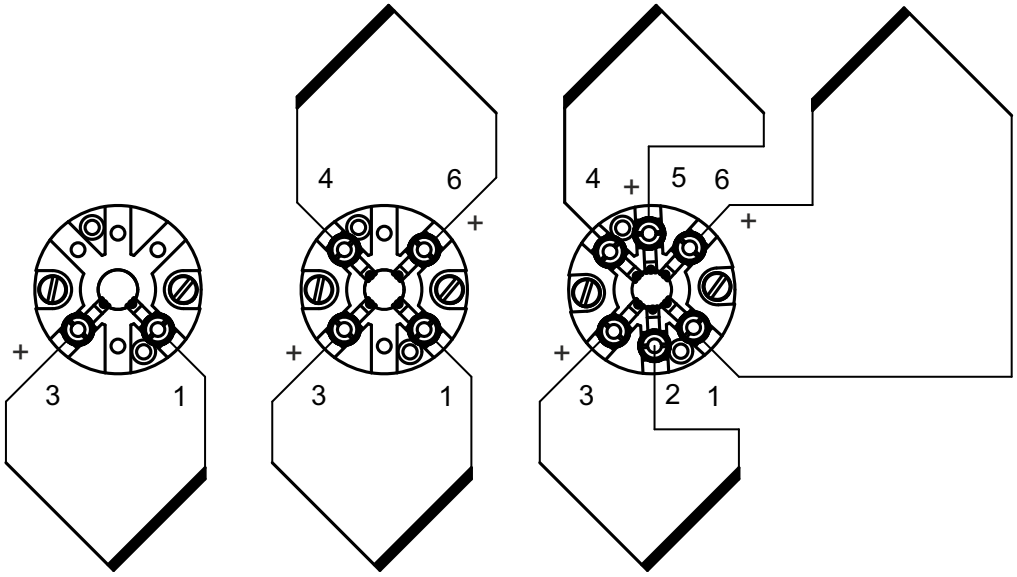
CLASS 3

Type	Temperature Range	Tolerance values
E	-167 to 40 °C -200 to -167 °C	±2,5 °C ±0,015 (t)
T	-67 to 40 °C -200 to -67 °C	±1 °C ±0,015 (t)
K/N	-167 to 40 °C -200 to -167 °C	±2,5 °C ±0,015 (t)
B	600 to 800 °C 800 to 1700 °C	±4 ±0,005(t)

Modular thermometer series: TEM

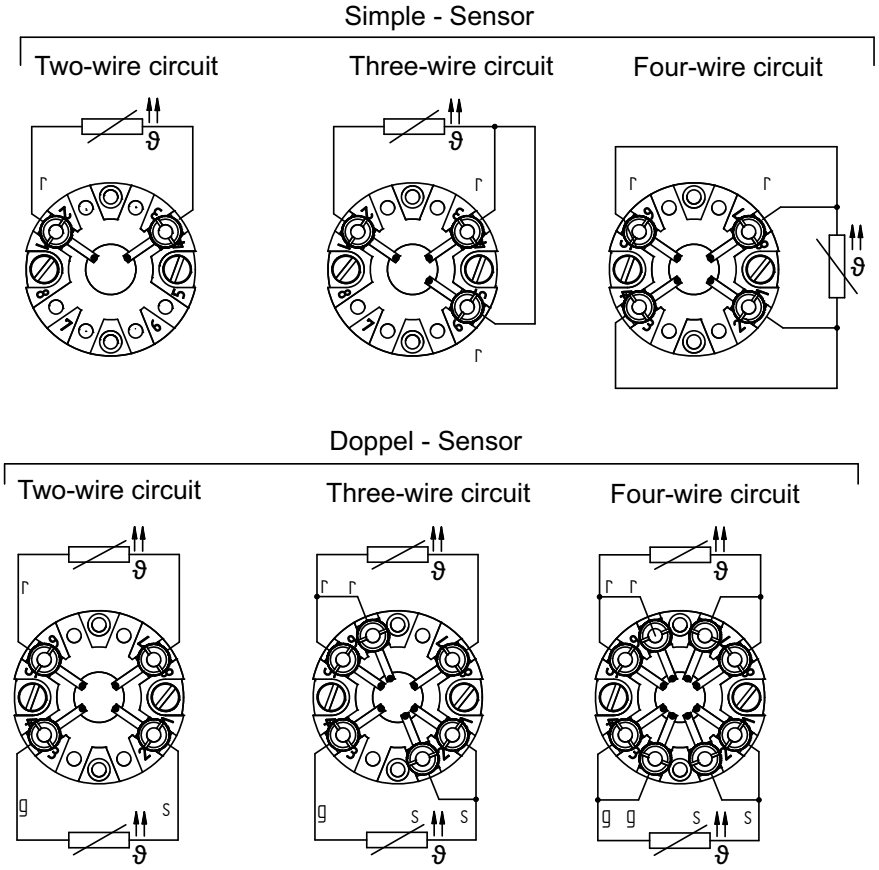
2.1.3 Wiring diagrams (with terminal block)

2.1.3.1 Thermocouples, according to IEC DIN EN 60584



simple double triple

2.1.3.2 Resistance thermometers, according to IEC DIN EN 60751



r - rot, red
g - gelb, yellow
s - schwarz, black

Modular thermometer series: TEM

2.2. Connection heads

As the name suggests, connection heads define the connection compartment of the thermometer and protect the connection base and/or the transmitter from environmental influences. The connection heads correspond to form B according to DIN 50446 and can be supplied with screw or hinged lids, with low or high lids and made of different materials. with screw or hinged lid, with low or high lid and made of different materials.
Available materials:

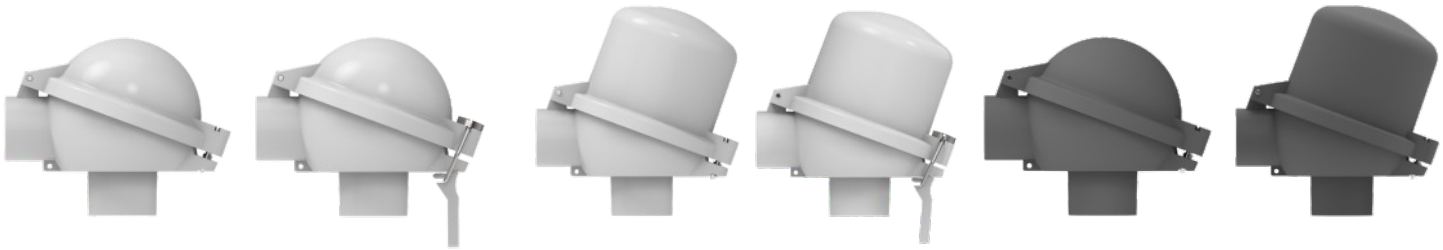
Die-cast aluminium, polyamide, polypropylene, stainless steel or grey cast iron

Aluminium and cast iron heads are painted, but can also be supplied with plastic coatings in various colours.
The standard size of the cable entry is M20x1.5;
There are also G ½ or ½" NPT variants.
By using adapters, other connection sizes can other connection sizes can also be realised. The design itself varies from a simple blind connection to a cable gland that is optimally adapted to the cable used. Some connection heads are also available with 2 cable entries. Connection heads with a high cover are suitable for accommodating an (additional) sensor head transmitter. A digital display can also be integrated. As a special design, the connection chamber can also be designed as a field housing in order to connect the thermometer with 3 transmitters for 3 measuring circuits, for example. This variant is not shown in this catalogue sheet.
The degree of protection depends on the cable gland used and is usually used, most often with the IP65. IP68 can also be achieved.
The screw plug of the connection heads with hinged cover can be provided with a hole for a sealing wire.

Detailed information on connection heads can be found in our data sheet no. 2000.01, Thermometer components and parts.

2.2.1 Connection head forms with images:

BUZ BUS BUZH BUSH BUZPA BUZHPA



BSA BSE BSG BUZHD B

Illustration of the connection heads without cable gland, as this is variable.
Böhme + Ewert supplies with M20x1.5 cable gland in grey plastic as standard.

The materials:
BUZ, BUS, BUZH, BUSH, BUZHD, B, BSA - die-cast aluminium
BUZPA, BUZHPA - polyamide grey, for Ex applications polyamide black
BSE - stainless steel (1.4401) BSG - cast iron

2.3 Transmitter

Böhme + Ewert does not have its own temperature transmitters. We take into account the factory standards of our customers. We primarily offer devices from ABB, Endress + Hauser and INOR.
Combinations of sensor head transmitters and digital indicators integrated in the connection head can also be realised.
A detailed selection and additional information can be found in B+E data sheet 3000.01.

2.3.1 Type overview

Manufacturer	Type series
ABB	TTH200, TTH300
Emerson	148, 248, 644
Endress+Hauser	TMT81, TMT82, TMT84
INOR	APAQ C130, IPAQ C202(X), IPAQ C330(X), IPAQ C520(X), IPAQ C530(X)

2.4.1 The most common thermowell materials

Material no.	Standard designation	Trade name	ASTM-Bez.	Pipe	Bar material
1.0305	P235GH (St35.8)			●	○
1.0460	P250GH (C22.8)			○	●
1.4306			A304L	●	●
1.4401			A316	●	●
1.4404			A316L	●	●
1.4435			A316L Mo+	●	●
1.4462		URANUS 45N	P51 / F51	●	●
1.4539		URANUS B6	A904L	●	●
1.4541			A321	●	●
1.4550			A347	○	●
1.4571			A316Ti	●	●
1.4749			A446	●	○
1.4762				●	●
1.4841			A314	●	●
1.4876		Alloy 800		●	●
1.4878			A321H	●	●
1.4903			F91	○	●
1.4922				●	○
1.4948			A304H	●	●
1.4958		Alloy 800H		●	●
1.4959		Alloy 800HT		●	●
1.4961			A347H	○	●
1.5415	15Mo3			●	●
1.7335	13CrMo4 5			●	●
1.7362			P5 / F5	●	●
1.7380	10CrMo9 10			●	●
2.4360		Monel 400		●	●
2.4602		Hastelloy C22		●	●
2.4605		Alloy 59		●	●
2.4610		Hastelloy C4		●	●
2.4633		Nicrofer 6025HT		●	●
2.4665		Hastelloy X		●	●
2.4816		Inconel 600		●	●
2.4819		Hastelloy C276		●	●
2.4842		Alloy 699XA		○	●
2.4858		Alloy 825		○	●
2.4880		Hastelloy HR-160		●	●
3.0255	EN AW 1050			●	●
3.0735		Titan Grade 2		●	●
6.0702		ZR 702		●	●

2.4. Thermowells

The selection and design of the thermowell has a significant influence on the measuring behavior and service life of the thermometer. The selection of a thermowell depends on the spatial conditions at the installation site and the stresses caused by temperature, flow, pressure and chemical attack. This selection then also determines the thermometer series used. It is usually advisable to manufacture the thermowell from the same material as the container or piping. This also applies to welded attachments such as flanges or screw-in spigots.

Many materials can be used as protective tube materials, from unalloyed steels to chrome-nickel alloys and nickel-based alloys. For special corrosion requirements ECTFE, PFA, tantalum coatings, stellitising or enamel coatings can be offered. Thermowells made entirely from plastics are also possible. Thermowells made of non-ferrous metals are rather uncommon in these series.

The table on the following page provides an overview of the most commonly used thermowell materials. In addition to the German standard DIN 43772 for thermometer protection tubes, there are many other designs that are often based on our customers' factory standards. Furthermore, we have included the thermowell types NF1, NF2 and NF3 according to NAMUR recommendation NE 170 in our program. Often, however, metrological requirements in connection with special process conditions require individual solutions. To improve the reaction time, thermowells can be designed with reduced/reduced tip diameters. The standard diameters are 6 mm (for measuring insert diameter 3 mm) and 9 mm (for measuring insert diameter 6 mm). For harsh process conditions, the protective tube tips can also be designed with thicker walls.

Normative requirements such as PED or ASME are taken into account when designing the thermowells and can be certified by test certificates. If proof of strength in accordance with ASME PTC 19.3-TW-2016 is to be provided, conformity with this set of rules must be ensured when designing the thermowell. Our contacts will be happy to advise you on this. The process connection can be made by welding, screwing or flanging. Details and dimensions are listed in connection with the individual series.

Only the most common designs are included in this catalog sheet. A detailed selection and additional information can be found in B+E data sheet 2104.01.

The thermowell used determines the thermometer type of this series, as shown at the beginning of page 2.

Open or perforated thermowells form a special group. These are not included in this data sheet and are shown in the corresponding data sheets of the thermometers for flue gas, air duct and room temperature measurement.

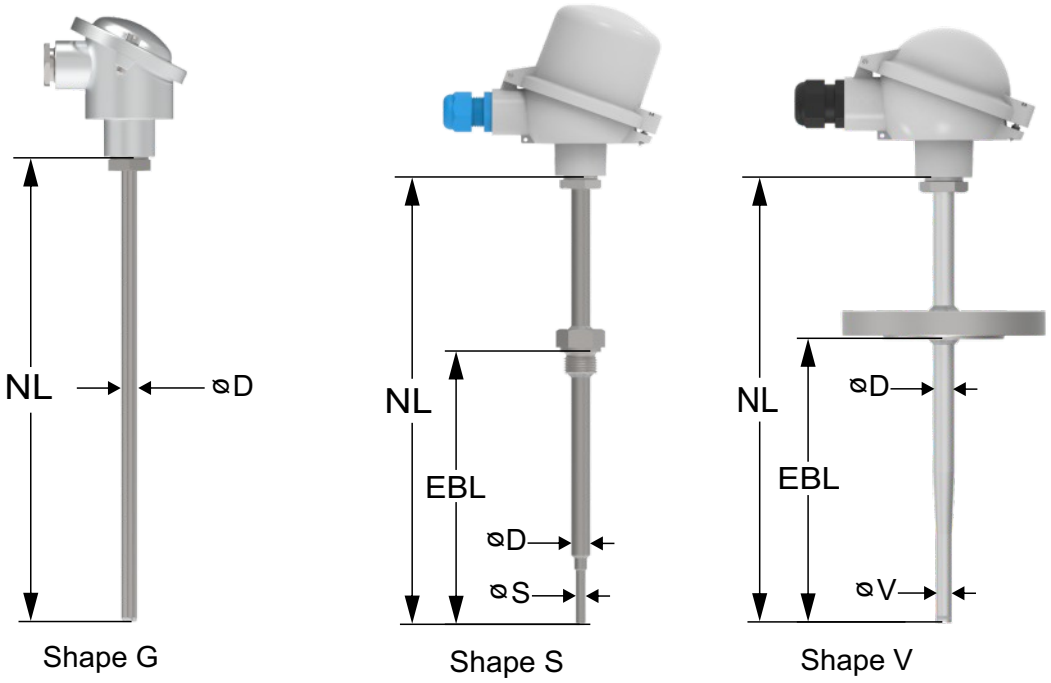
Classification Pressure Equipment Directive:

Thermometer protection tubes do not have their own pressurized housing and are therefore not pressure equipment within the meaning of the directive. They are considered components for pressure vessels. This is confirmed in Guideline 1/40 of the PED. These components must not bear the CE mark within the meaning of the PED. Further information can be found in the user information „Application of Directive 2014/68/EU (PED) with regard to thermometer protection tubes".

3. The series

3.1 One-piece thermometers

3.1.1 TEM110



Nominal lengths (NL):

The nominal lengths are staggered in such a way that they correspond to the resulting measuring insert lengths of DIN 43735 correspond. Intermediate lengths are intermediate lengths are possible. The table opposite gives an overview of the standard nominal length and the maximum recommended length depending on the pipe diameter.

Thermowell diameter >14 mm should only be used from a nominal length of 500 mm be used in order to avoid possible measuring errors due to heat dissipation minimised.

Connection head connection:
Screw connection, thread M24x1.5 (DIN standard)

Variants:
Screw connection, M20x1.5 thread
Screw connection, thread G 1/2
fixed thread 1/2" NPT
smooth (without thread, max. IP53)

Nominal length(NL)	Pipe diameter		
	to 9 mm	to 14 mm	> 14 mm
250	●	●	●
290	●	●	●
350	●	●	●
380	●	●	●
410	●	●	●
500	●	●	●
530		●	●
630		●	●
710		●	●
800		●	●
1000		●	●
1250		●	●
1400			●
1600			●
1800			●
2000			●

Measuring insert length (MEL) = nominal length (NL) + 25

Modular thermometer series: TEM

Overview of pipe diameter/material combinations

Diameter "S" and measuring insert-Du.

6 mm	3 mm
9 mm	6 mm
12 mm	6 mm
14 mm	8 mm

Diameter "V" = 9 mm (measuring insert diameter 6 mm)
Diameter "V" = 11 mm (measuring insert diameter 8 mm)

The following pipe diameters comply with DIN 43772:

Form 2	Form 3
Diameter (D)	Diameter (D/V)
9 x 1 mm	
11 x 2 mm	
12 x 2,5 mm	12/9 x 2,5 mm
14 x 2,5 mm	14/11 x 2,5 mm

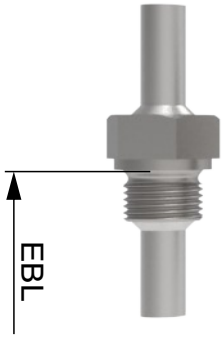
Diameter(D) x Wall thickness			
Form G	**Form S**	**Form V**	**Materials**
(D)	(D/S)	(D/V)	
9x1 mm	9/6 mm	-	1.4571
10x1 mm	10/6 mm	-	1.4571; 2.4816; 2.4610; 3.7035
10x1,5 mm	10/6 mm	-	1.4571; 2.4816
10x2 mm	10/6 mm	-	1.4571; 2.4816
11x2 mm	11/2 mm	-	1.4571
12x1 mm	12/6 mm; 12/9 mm	-	2.4602; 2.4610; 1.4435
12x1,5 mm	12/6 mm; 12/9 mm	-	1.4571
12x2 mm	12/6 mm; 12/9 mm	-	1.4841; 3.7035
12x2,5 mm	12/6 mm; 12/9 mm	12/9 mm	1.4571
13,72x2,24 mm	13,72/6 mm; 13,72/9 mm	-	1.4539; 2.4360
14x2 mm	14/6 mm; 14/9 mm	-	2.4816
14x2,5 mm	14/6 mm; 14/9 mm	14/11 mm	1.0305; 1.4571
15x1,3 mm	15/6 mm; 15/9 mm	-	Kanthal-AF
15x2 mm	15/6 mm; 15/9 mm	-	1.0305; 1.4571; 1.4749; 1.4841
16x2 mm	16/6 mm; 16/9 mm; 16/12 mm	-	1.4959; 2.4816
16x2,5 mm	16/6 mm; 16/9 mm; 16/12 mm	-	1.4571
17,2x3,6 mm	17,2/6 mm; 17,2/9 mm; 17,2/12 mm	-	1.7335
18x1,5 mm	18/6 mm; 18/9 mm; 18/12 mm	-	3.7035
18x2 mm	18/6 mm; 18/9 mm; 18/12 mm	-	1.4571
20x2 mm	18/6 mm; 18/9 mm; 18/12 mm	-	1.4571; 3.0255
21,3x1,65 mm	21,3/6 mm; 21,3/12 mm; 21,3/14 mm	-	2.4605; 2.4610
21,3x2,11 mm	21,3/6 mm; 21,3/12 mm; 21,3/14 mm	-	2.4360; 2.4602; 2.4610; 2.4819; 3.7035
21,3x2,6 mm	21,34/6 mm; 21,34/12 mm; 21,3/14 mm	-	1.0305; 1.4571; 1.4539
21,34x2,77	21,34/6 mm; 21,34/12 mm; 21,3/14 mm	-	1.4462; 2.4068; 2.4602; 2.4816; 2.4880
21,34x3,74	21,34/6 mm; 21,34/12 mm; 21,3/14 mm	-	1.4959
22x2 mm	22/6 mm; 22/12 mm; 22/14 mm	-	1.4571; 1.4749; 1.4762; 1.4841; Kanthal-AF
26,9x2,6 mm	26,9/6 mm; 26,9/12 mm; 26,9/14 mm	-	1.4571; 1.4749; 1.4841
33,4x3,38 mm	33,4/6 mm; 33,4/12 mm; 33,4/14 mm	-	1.4404; 1.4835; 1.4958; 1.4959

Other pipe diameter - material - combinations on request

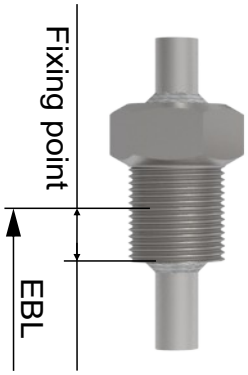
Modular thermometer series: TEM

Process connections:

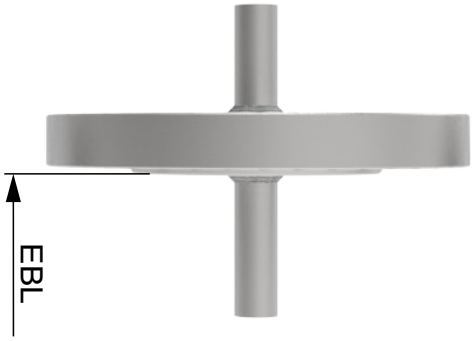
Fixed: Screw-in spigot and flanges
Welding usually on both sides



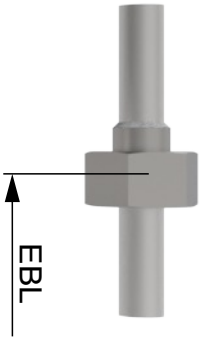
Parallel thread



Conical thread



Flange



Union nut

Movable:

Thermocouple fitting, flange or screw-in spigot with thermocouple fitting
(PTFE clamping rings can also be used for applications up to 5 bar)

Stop flange, threaded socket (for applications up to 1 bar, pipe diameters 15, 22, 26 and 32 mm)
These process connections are the exception in this type series;
their standard application is in thermocouples from the TEG series

Thermocouple fitting
(compression fitting)

Bushing

Flange with
thermocouple fitting

Flange with
bushing

Stop flange

Modular thermometer series: TEM

Process connection sizes:

For smaller nominal diameters or thread sizes, the maximum possible thermowell diameter must be observed.

Flanges:

DIN EN 1092-1

Nominal sizes DN15 to DN150
Nominal pressures PN10 to PN100 (PN160)
Sealing surfaces:
- Form B1 (up to PN40)
- Form B2 (from PN63)
- Form C (spring)
- Form D (groove)

ANSI B16.5

Nominal widths 1/2" to 2"
Nominal pressures 150 LBS to 2500 LBS
Sealing faces:
- FF (Flat Face)
- RF (Raised Face)
- RTJ (Ring Type Joint)
- LM (Large Male)
- LT (Large Tongue)
- SM (Small Male)
- ST (Small Tongue)
- LF (Large Female)
- LG (Large Groove)
- SF (Small Female)
- SG (Small Groove)

The RF sealing surface can also be supplied in the surface finishes RFSM (smooth finish) and RFSR (serrated finish) can be supplied.

Other flange designs on request

Thread:

parallel pipe threads G 1/4 - G 2
conical pipe threads R 1/2" to R 2"
conical pipe threads 1/2" NPT to 2" NPT
metric threads M14x1.5 to M27x2

Thermocouple fittings (compression fittings):

The standard material used is 1.4571 or 1.4401.
The clamping ring can also be low temperatures and pressures (150 °C, 5 bar), the clamping ring can also be made of PTFE.
For corrosive applications, fittings can also be supplied in highly corrosion-resistant alloys such as Hastelloy, titanium or PTFE can also be supplied.
We can provide more detailed information on request.

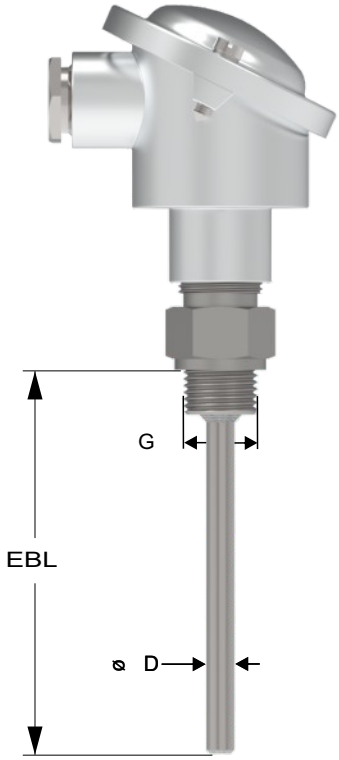
Covers:

Coatings or coatings to improve corrosion resistance are only useful for flange connections.
The exception to this is armouring/positioning coatings, which are generally only applied in the area exposed to the flow.

Corrosion-improving coatings: ECTFE, PFA, tantalum, enamel

Abrasion-improving coatings (armouring): META43, Stellite
For particularly harsh process conditions, the wetted area of the protective tube can also be made entirely of Stellite.

3.1.2 TEM111 One-piece thermometer without neck tube, compact design, Thermowell made from tube



Although technically possible, only installation lengths up to 1000 mm and thread sizes up to G 1 make sense.
Flange connections are not used.
As the connection head is located close to the surface of the pipe or container,
this variant can only be used at low surface temperatures of up to 120 °C.
When using a sensor head transmitter, a maximum surface temperature of 80 °C should not be exceeded.

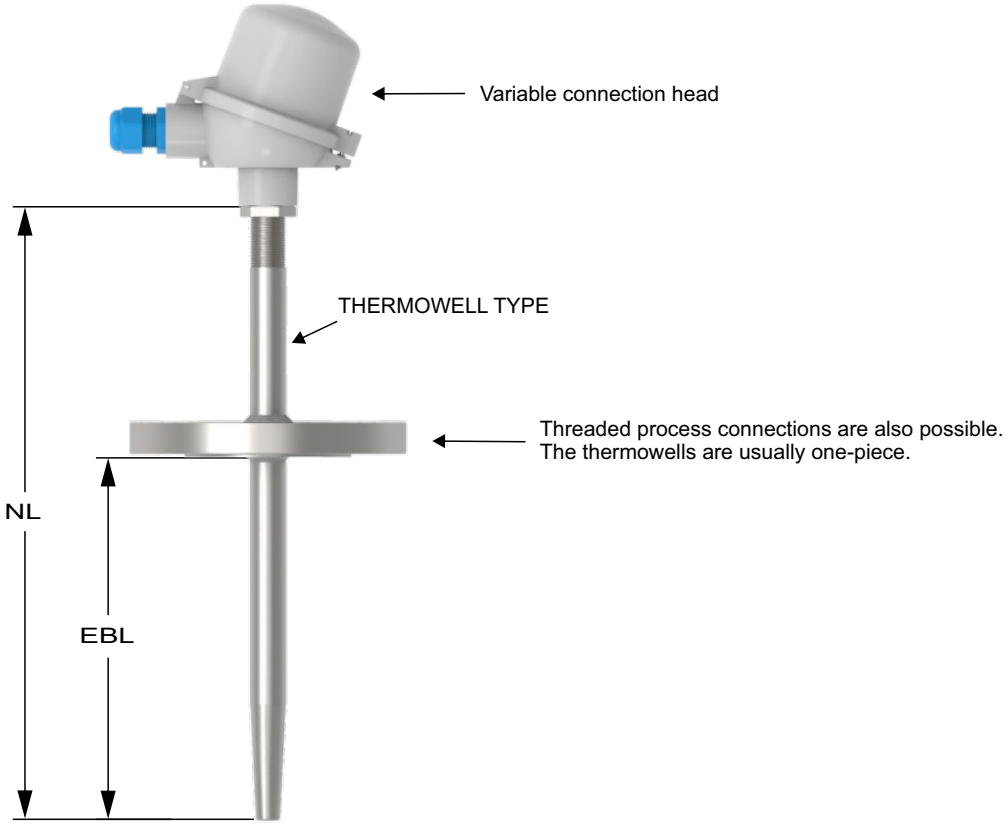
The same pipe material combinations are available under 3.1.1 TEM110,
but the maximum diameter should be limited to 22 mm.

The most important thread sizes (G)

parallel	conical	
	DIN EN 10226 *)	ANSI
G 3/8	R 3/8"	3/8" NPT
G 1/2	R 1/2"	1/2" NPT
G 3/4	R 3/4"	3/4" NPT
G 1	R 1"	1" NPT

*) earlier DIN 2999

3.1.3 TEM120 One-piece thermometer with solid thermowell and neck tube section

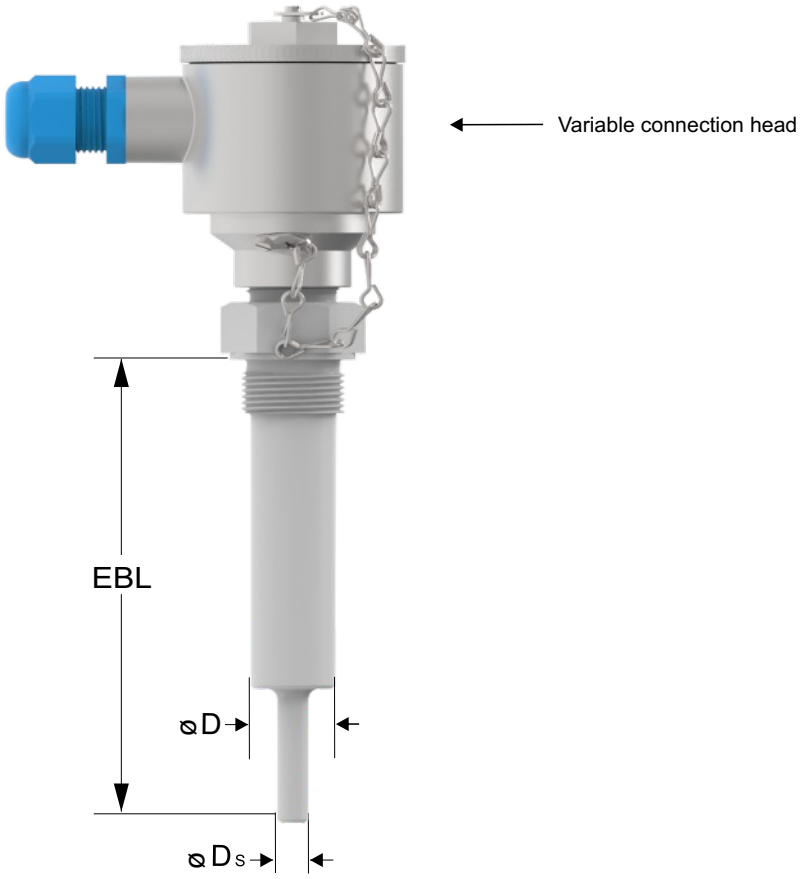


The connections to the connection head can be designed in thread sizes M20x1.5; M24x1.5; G 1/2 and 1/2" NPT.

There are several thermowell variants for this design.
These can be found in our data sheet 2104.01

This category also includes electrical thermometers with thermowells according to Namur recommendation no. 170.

3.1.4 TEM121 One-piece thermometer with solid thermowell, without neck tube section (compact thermometer)



Although technically possible, only installation lengths up to 1000 mm and thread sizes up to G 1 make sense.
Flange connections are not used.
As the connection head is located close to the surface of the pipe or container, this this variant can only be used at low surface temperatures of up to 120 °C.
When using a sensor head transmitter, a maximum surface temperature of 80 °C should not be exceeded.

The connections to the connection head can be designed in thread sizes M20x1.5; M24x1.5; G 1/2 and 1/2" NPT.
The maximum thermowell diameter depends on the process connection thread.
The most important thread sizes (G)

parallel	conical	
	DIN EN 10226 *)	ANSI
G 3/8	R 3/8"	3/8" NPT
G 1/2	R 1/2"	1/2" NPT
G 3/4	R 3/4"	3/4" NPT
G 1	R 1"	1" NPT

*) earlier DIN 2999

Metric process connection threads are rather uncommon, but can also be manufactured on request.

3.2 Multi-part thermometers

Any combination of thermowell and neck tube types results in a wide range of designs.
The decisive factor is often a specified factory standard on the part of the user.
However, special process conditions can also result in a special design of the neck tube.
B+E neck tubes are made of stainless steel; other materials can be used on request.
The dimensioning of the neck tube nominal length (HRNL) refers to the dimension
from the grip point or from the sealing surface on the process side to the lower edge
of the connection head, i.e. the visible area.
The non-visible area is 15 mm for connection heads of type Bx.

The neck tube diameters can, of course, also depend on the measuring insert diameter,
9 mm, 11 mm, 12 mm, 14 mm, 15 mm and 21.3 mm.

The nominal neck tube lengths are based on the given standard or are designed by B + E
in such a way that a standard length of the measuring insert according to DIN 43735 is obtained.
Of course, intermediate and special lengths can also be realized.

3.2.1 Neck tube variants

The neck tubes can be classified as follows:

a) according to the type of head connection thread

b) according to the design of the thermowell or process connection thread

c) continuous or separable (with separable screw connection)

a) In Germany and most European countries, the M24x1.5 loose screw connection has become established as the head connection thread. In Great Britain, G 1/2 is also frequently used.
Conical threads such as 1/2" NPT correspond to the so-called ANSI style and are mainly used in the American and Asian economic areas.

b) For parallel threads, process connection threads can be designed as a fixed screw-in spigot, as a loose screw connection or as a union nut. Conical threads are always designed as fixed screw-in studs.
A special feature is the H6 (smooth) design. This neck tube is attached to the process using a thermocouple screw connection. This is either provided by the customer or can be supplied as an accessory.

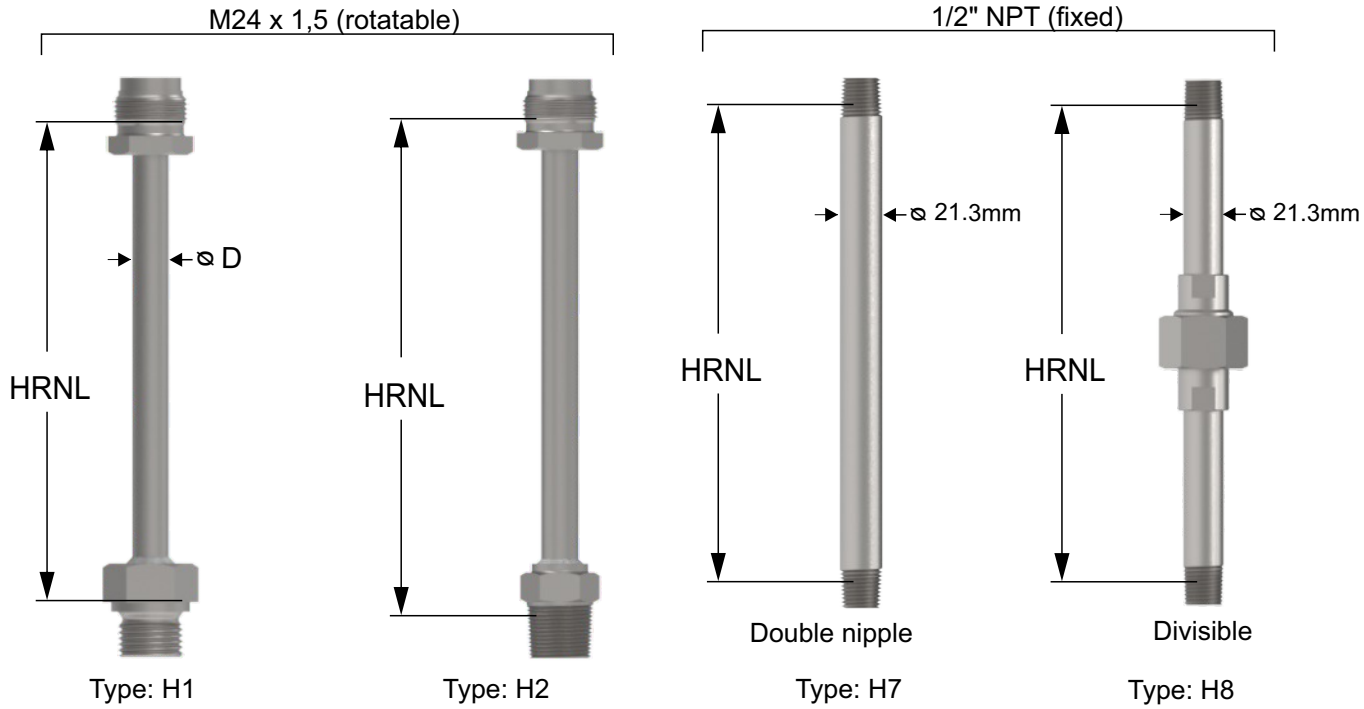
c) Neck tubes with parallel threads are always continuous. Only neck tubes with tapered threads are often designed as separable to allow alignment of the connection head.

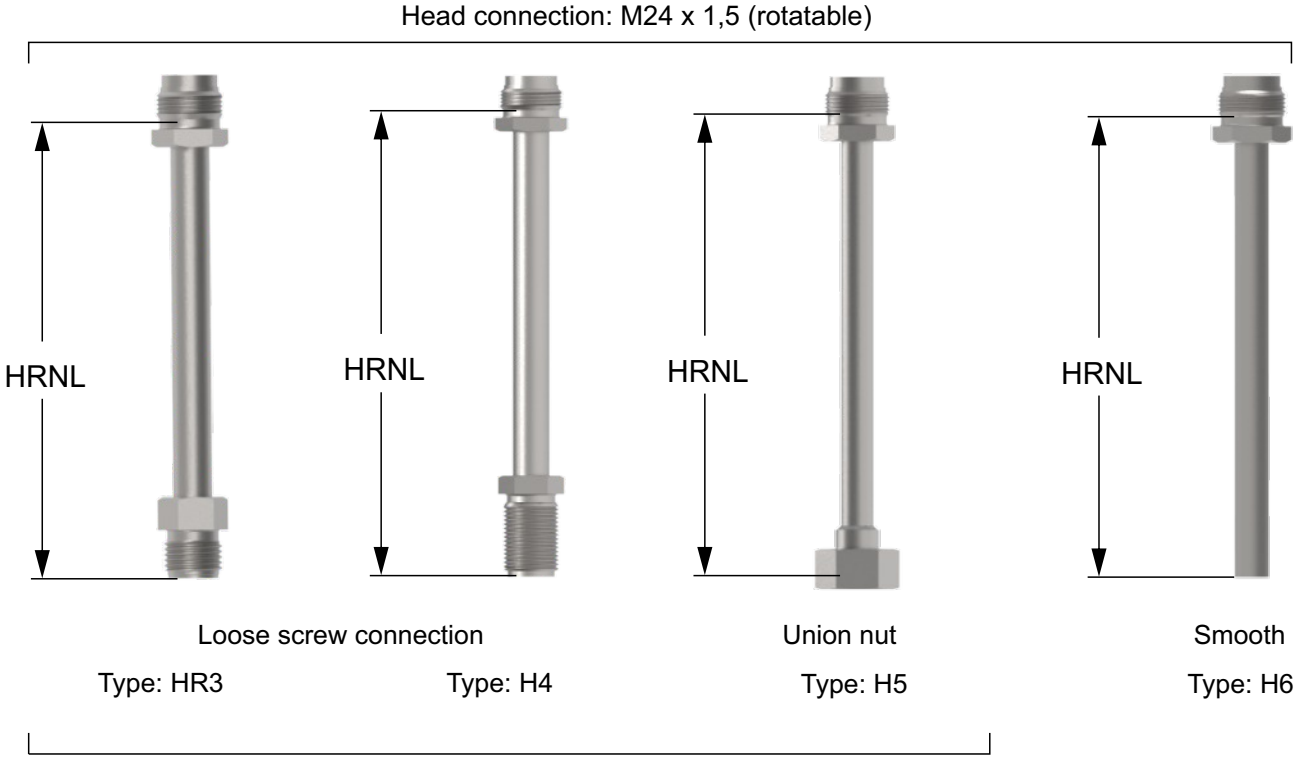
The H1 type (M24x1.5 head screw connection - fixed screw-in spigot with parallel thread) can also be found in the German thermowell standard DIN 43772:2000.

The following page shows a graphic representation of the neck tube variants.

Modular thermometer series: TEM

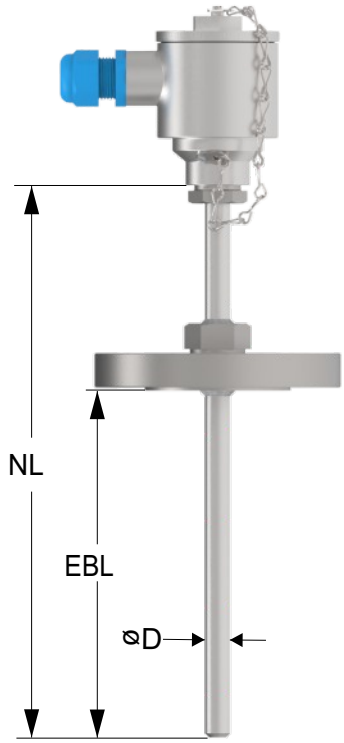
Head connection:

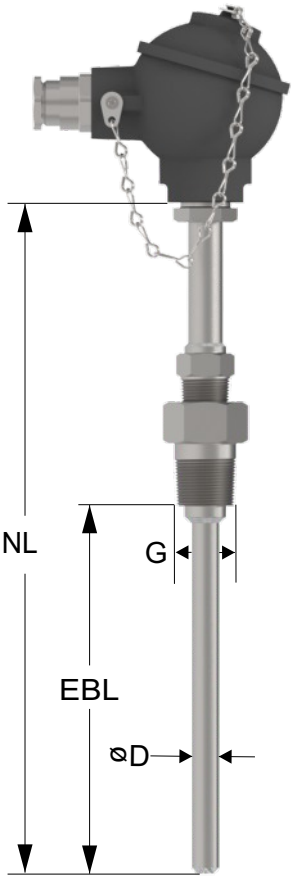




Possible process closure threads: M20 x 1,5; M18 x 1,5; M14 x 1,5; G 1/2; G 3/4, R 1/2"
others on request

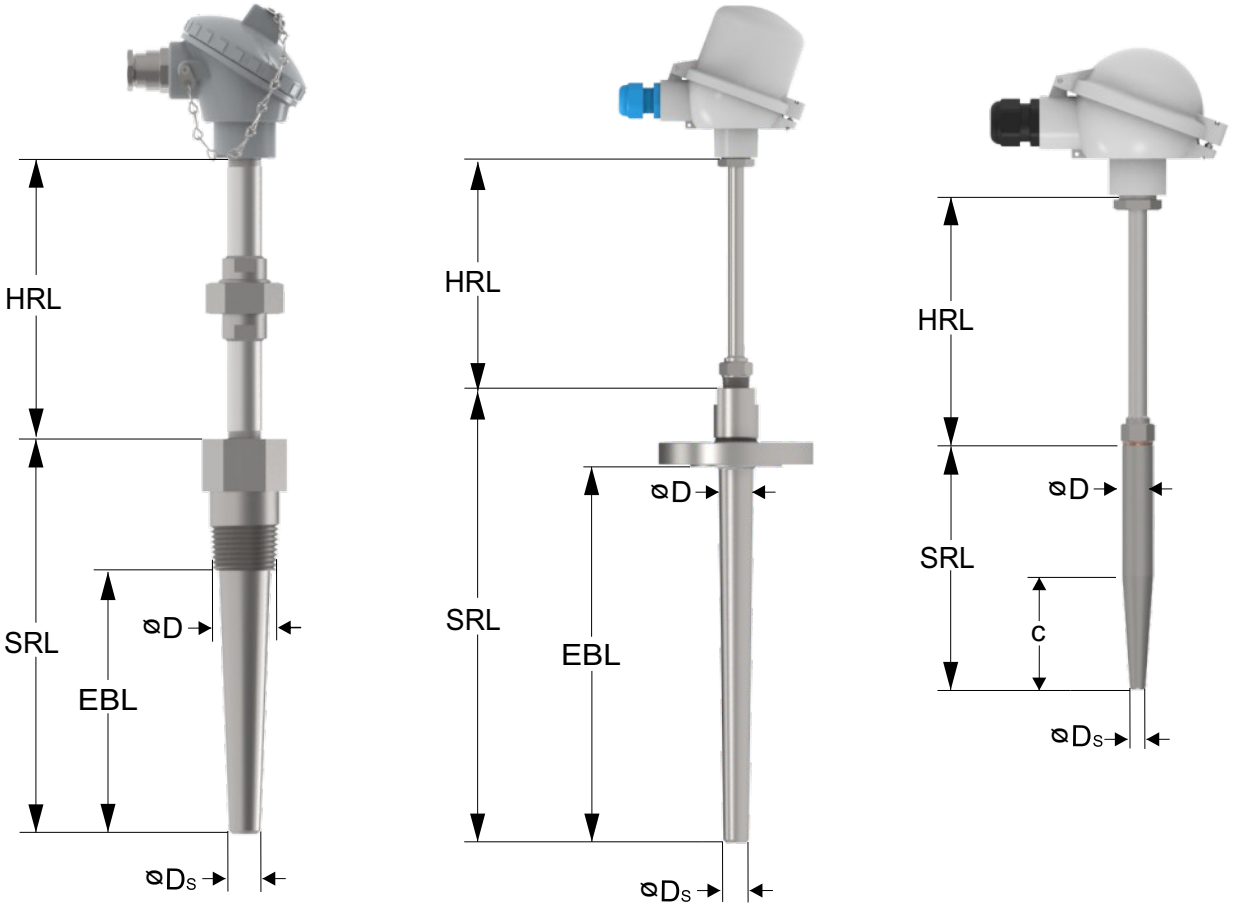
3.2.2 TEM210 multi-part thermometer with thermowell made of tube





The same specifications apply to the possible thermowells as for the one-piece thermometers, as shown on pages 11 and 12 of this data sheet.

3.2.3 TEM 220 multi-part thermometer with solid thermowell



This type series is particularly suitable for medium to particularly harsh process conditions.
The thermowells can be designed as weld-in, screw-in or flanged thermowells.
Adaptations to almost any process requirement are possible.

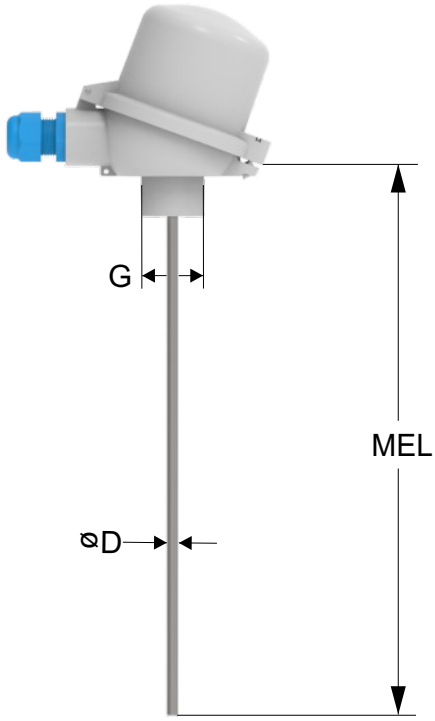
Screw-in thermowells can have parallel threads and conical threads.

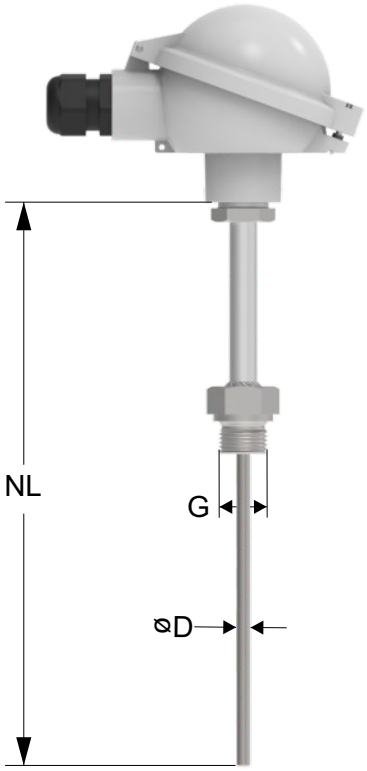
In addition to the typical flange sealing surfaces, flange protection tubes can also be fitted with the lens seal for high-pressure applications (not shown on this page).

As accessories for the weld-in protection pipes, we offer corresponding weld-in sockets (Weldolets) are available.

All thermometers based on thermowell shapes 4 - 9 of DIN 43772 can also be found in this series.

3.3 TEM 31, TEM 32 Thermometer modules





The types TEM31 and TEM32 are designed for mounting on the thermowell provided in the system.
They are therefore thermometer assemblies in the true sense of the word. The passage to the connection head is open on delivery, so that in the event of dust, moisture or even process media could enter the connection head in the event of improper installation.

Mounting on a B+E protective tube results in the following possible variants:

1. TEM31:

Electrical thermometer, consisting of connection head (form B), measuring insert and, optionally, sensor head transmitter.
Threaded versions "G":

– M24x1,5 (Standard)
– M20x1,5
– G 1/2
– 1/2" NPT

resulting variants: TEM110 und TEM111
TEM120 und TEM121

On request, this type can also be equipped with A connection heads. This variant can then be completed to straight thermocouples according to DIN 50446, possibly also to the types mentioned in 1.

2. TEM32:

Electrical thermometer, consisting of connection head (form B), measuring insert, neck tube and, optionally, sensor head transmitter.

All variants listed on page 2 under point 3.2 can be realized.
Resulting variants:
TEM210 und TEM220

Anschlußkopf, Form BUZH, IP65
Werkstoff Aluminium-Druckguß
CONNECTION HEAD, FORM BUZH, IP65
MATERIAL ALUMINIUM DIE-CASTING

M24 x 1,5
SW 24 / WS24

Klemmringverschraubung W. PFA
THERMOCOUPLE FITTING, MAT. PFA

G 1/2

ϕ 12

Schutzrohr
Werkstoff 2.4610
THERMOWELL
MATERIAL ALLOY C4

ϕ 6

SW 26
WS 26

14

ca. 60

35

Nennlaenge (NL) / NOMINAL LENGTH (NL)

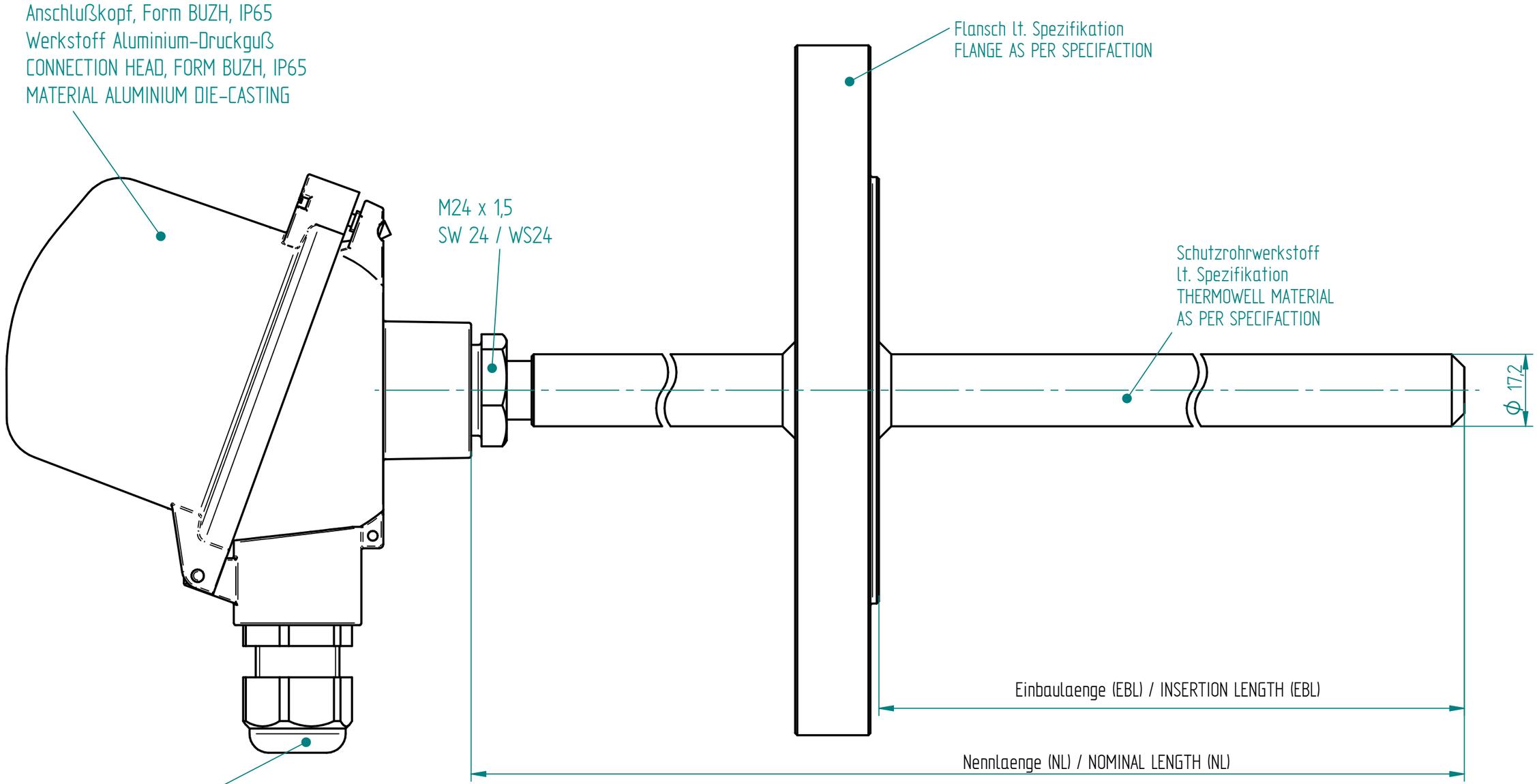
Kabelverschraubung M20 x 1,5
Kunststoff, schwarz
CABLE GLAND, M20 x 1.5
PLASTIC, BLACK

Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Maßstab: 1:1	Werkstoff:		Allgemeintoleranz / GENERAL TOLERANCE: DIN ISO 2768-m
Erstellt durch: Michael Boehme	Genehmigt von: MichaelBoehme		Dokumentenart:
Titel, Zusätzlicher Titel: El. Thermometer, Typ TEM10 EL. THERMOMETER, TYPE TEM10			Sachnummer: 111110-0002
Änd.: 0	Ausgabedatum: 04.08.2021	Spr.:	Blatt: 1/1

Boehme + Ewert

A3



Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert
REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert

Maßstab: 1:1

Werkstoff:

Allgemeintoleranz / GENERAL TOLERANCE: DIN ISO 2768-m

Boehme + Ewert

Erstellt durch: Michael Boehme

Genehmigt von: MichaelBoehme

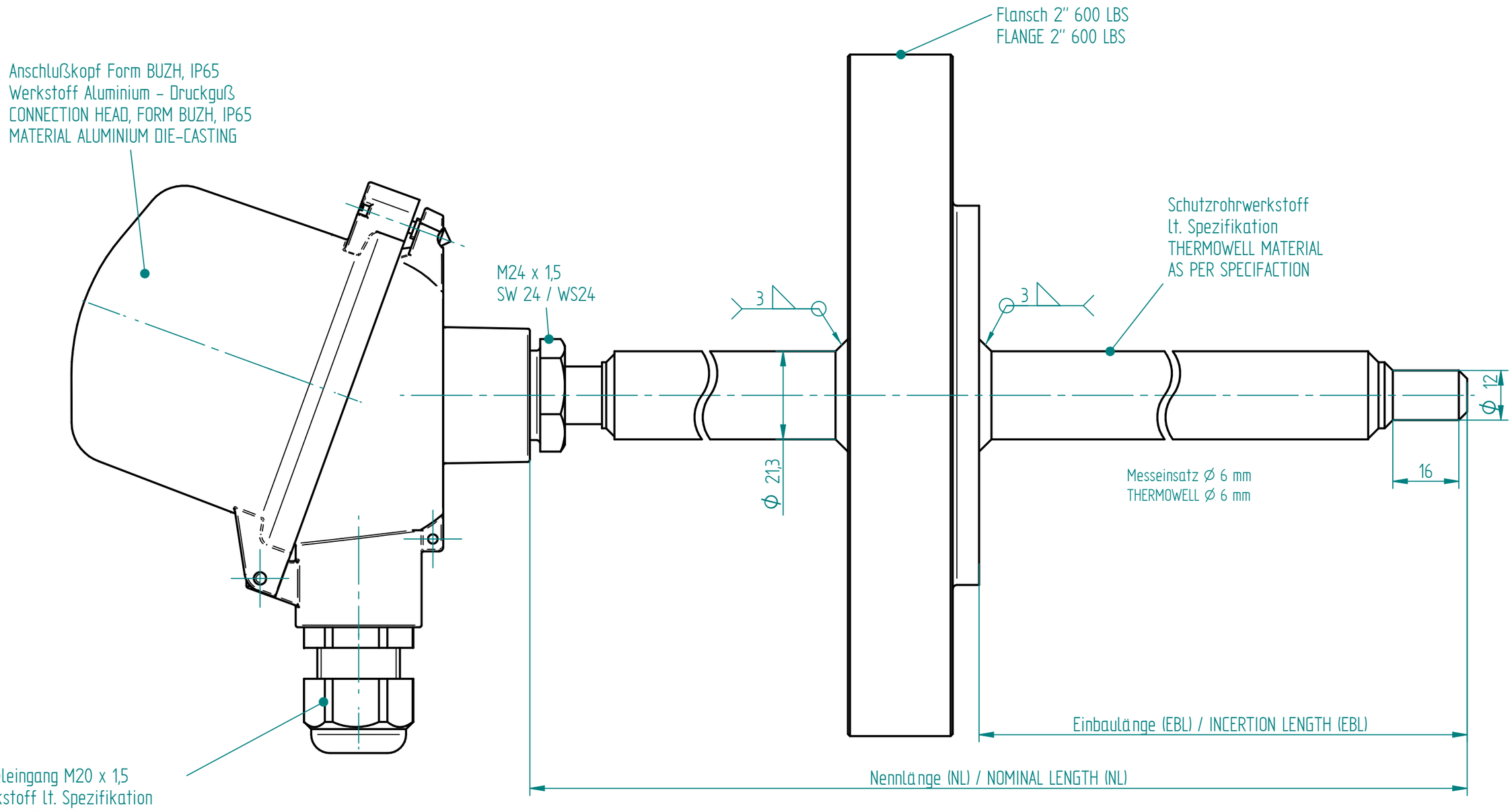
Dokumentenart:

Titel, Zusätzlicher Titel:
El. Thermometer, Typ TEM10
EL. THERMOMETER, TYPE TEM10

Sachnummer:

And.	Ausgabedatum	Spr.	Blatt
0	12.08.2021		1/1

A3



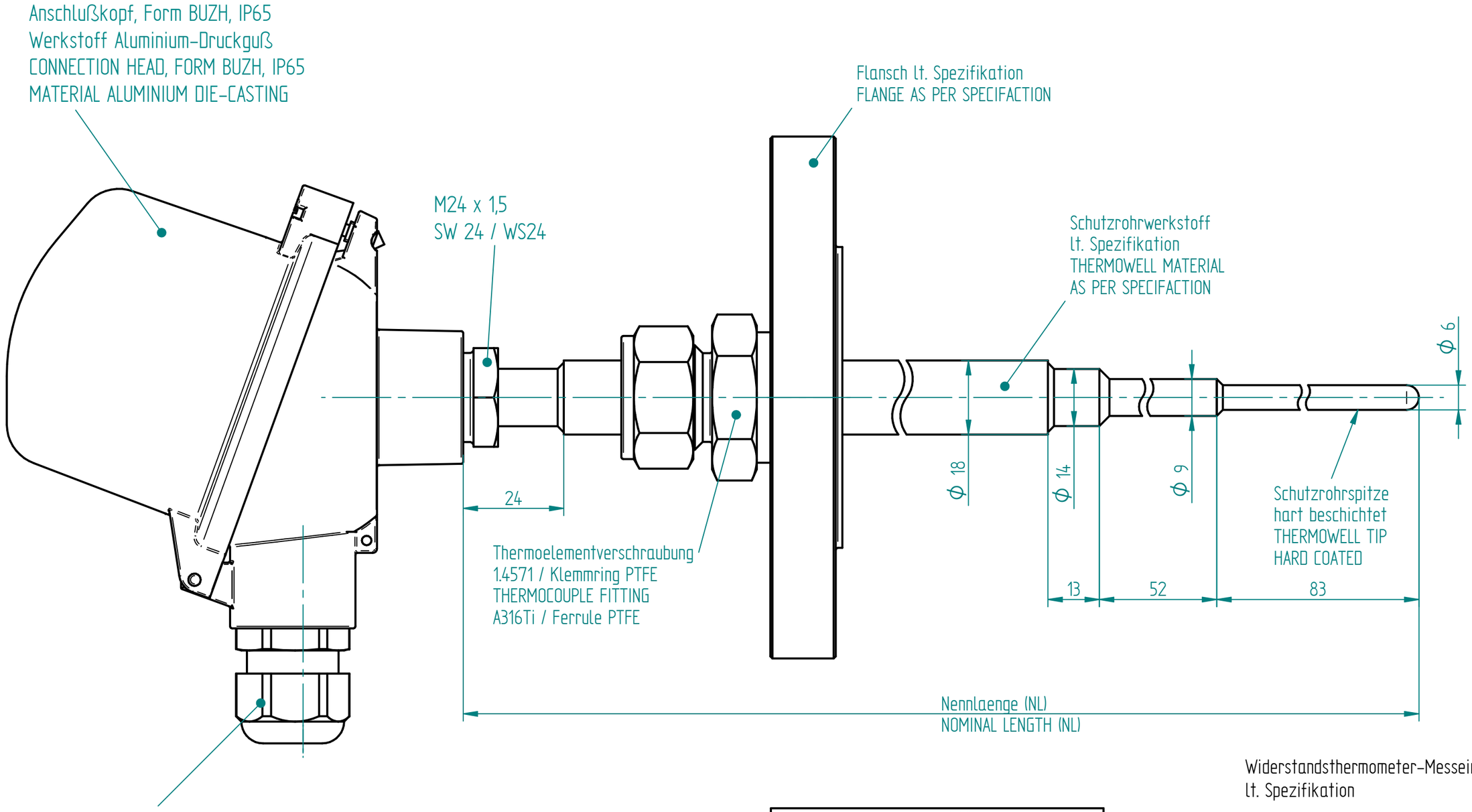
Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert
REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert

Maßstab: 1:1	Werkstoff:		Allgemeintoleranz / GENERAL TOLERANCE: DIN ISO 2768-m
Erstellt durch: SergejEwert	Genehmigt von: MichaelBoehme		Dokumentenart:
Titel, Zusätzlicher Titel: Thermometer Typ TEM10			Sachnummer: 111110-0004
		Änd. / Ausgabedatum / Spr.	Blatt: 1/1

Boehme + Ewert

A3



Widerstandsthermometer-Messeinsatz
lt. Spezifikation

RTD-INSET
AS PER SPECIFICATION

Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert
REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert

Maßstab	Werkstoff	Allgemeintoleranz / GENERAL TOLERANCE
1:1		DIN ISO 2768-m

Erstellt durch	Genehmigt von	Dokumentenart
Michael Boehme	MichaelBoehme	

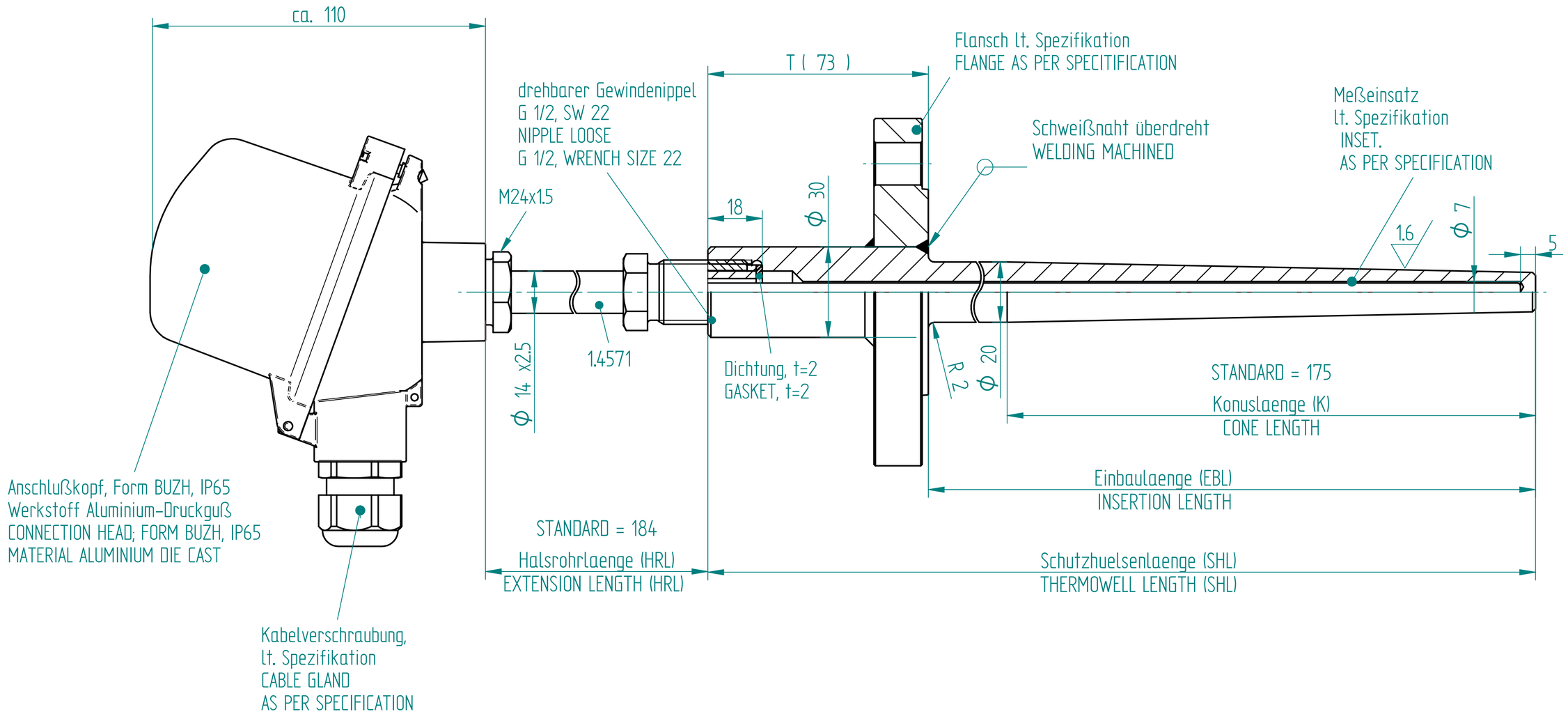
Boehme + Ewert

Titel, Zusätzlicher Titel
Widerstandsthermometer, Typ TEM10
RTD-ASSEMBLY, TYPE TEM10

Sachnummer
111111-0001

Änd.	Ausgabedatum	Spr.	Blatt
0	06.01.2022		1/1

A3



Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Bohme + Ewert
REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert

Maßstab / SCALE: 1:1

Werkstoff:

Allgemeintoleranz / GENERAL TOLERANCE: DIN ISO 2768-m

Boehme + Ewert

Erstellt durch: SergejEwert

Genehmigt von: Michael Böhme

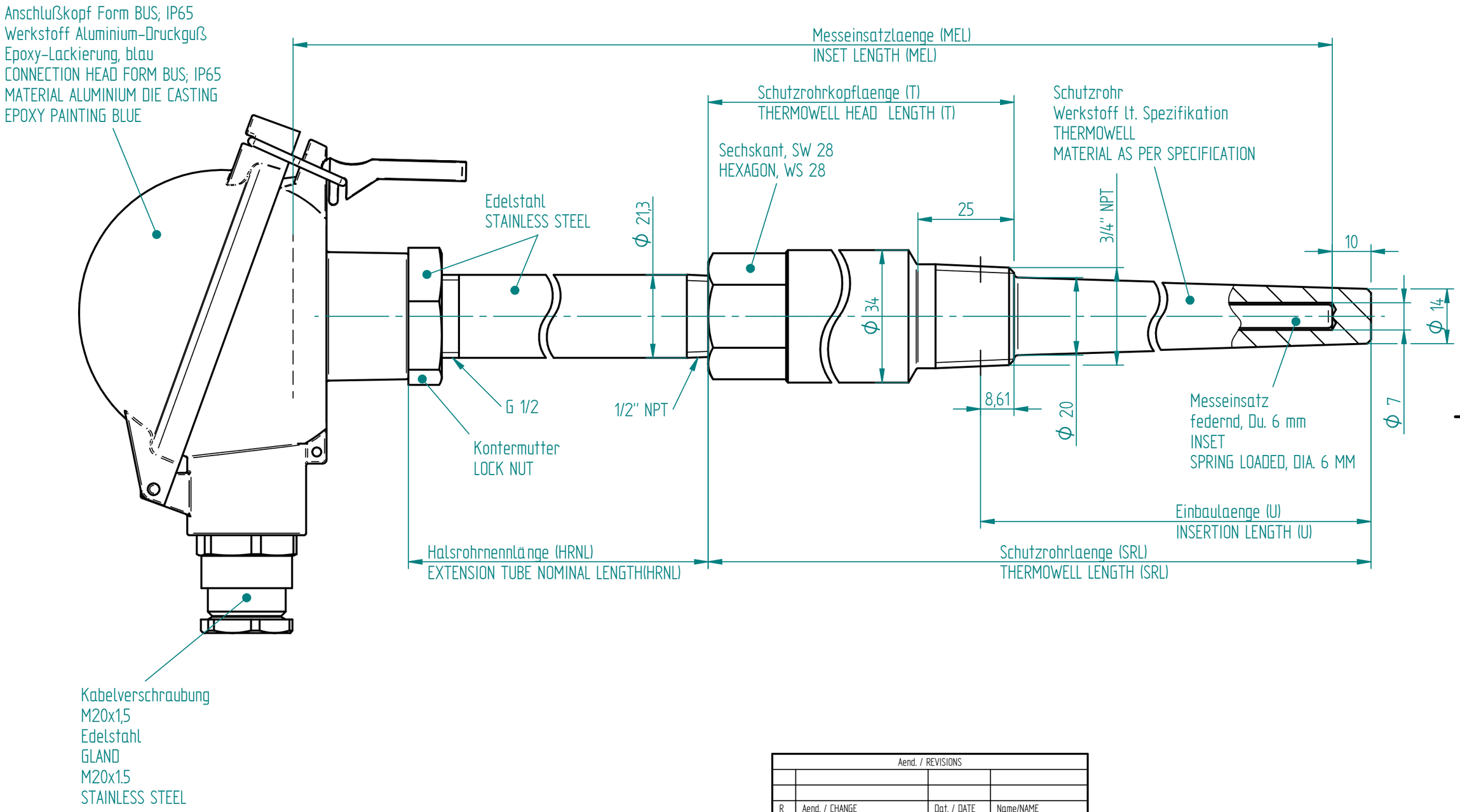
Dokumentenart:

Titel, Zusätzlicher Titel:
Thermometer, Typ TEM220
THERMOMETER, TYPE TEM220

Sachnummer: 111122-0001

And.	Ausgabedatum	Spr.	Blatt
0	05.11.2021		1

A2

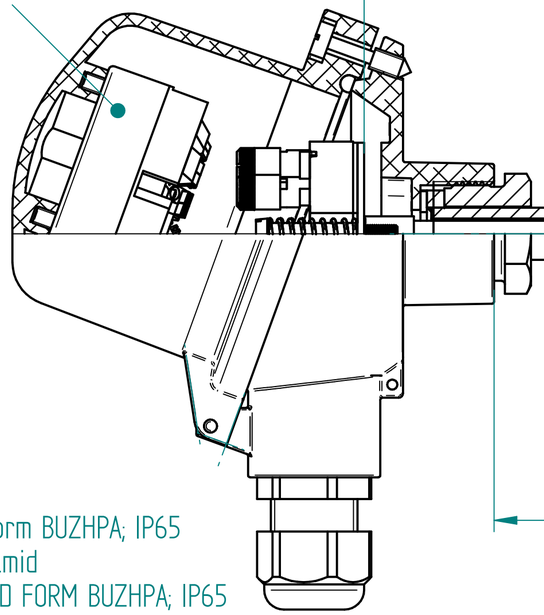


Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert		Maßstab: 1:1	Werkstoff:	Allgemeintoleranz / GENERAL TOLERANCE: DIN ISO 2768-m
Boehme + Ewert		Erstellt durch: Michael Boehme	Genehmigt von: MichaelBoehme	Dokumentenart:
		Titel, Zusätzlicher Titel: El. Thermometer, Typ TEM220 EL. THERMOMETER ASS., TYPE TEM220	Sachnummer: 111122-0003	
			Änd.: 0 / Ausgabedatum: 24.06.2022 / Spr. / Blatt: 1/1	

A3

Optional:
Messumformer lt. Spezifikation
OPTION:
TRANSMITTER AS PER SPECIFICATION



Messeinsatzleange (MEL)
INSET LENGTH (MEL)

ϕ 12 x2,5

5

Schutzrohr
Werkstoff 1.4571
THERMOWELL
MATERIAL A316TI

Messeinsatz, Typ BMM130
ϕ 6; hocherschütterungsfest
INSET, TYPE BMM130
ϕ 6; HIGH VIBRATION PROOF

Nennlaenge (NL)
NOMINAL LENGTH (NL)

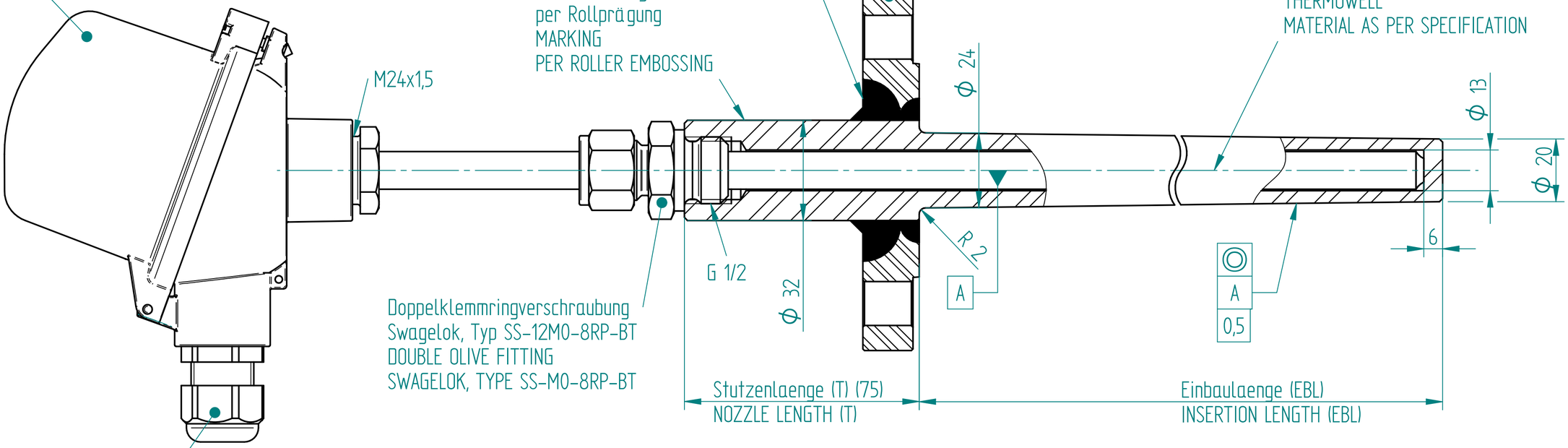
Anschlußkopf Form BUZHPA; IP65
Werkstoff Polyamid
CONNECTION HEAD FORM BUZHPA; IP65
MATERIAL POLYAMIDE

Flansch durchgeschweißt
FLANGE FULL PENETRATION WELDING

Kennzeichnung
per Rollprägung
MARKING
PER ROLLER EMBOSSING

Flansch lt. Spezifikation
FLANGE AS PER SPECIFICATION

Schutzhrohr
Werkstoff lt. Spezifikation
THERMOWELL
MATERIAL AS PER SPECIFICATION



Doppelklemmringverschraubung
Swagelok, Typ SS-12M0-8RP-BT
DOUBLE OLIVE FITTING
SWAGELOK, TYPE SS-M0-8RP-BT

Kabeleingang lt. Spezifikation
CABLE ENTRY AS PER SPECIFICATION

Stutzenlaenge (T) (75)
NOZZLE LENGTH (T)

Einbaulaenge (EBL)
INSERTION LENGTH (EBL)

Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Bohme + Ewert
REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert

Maßstab / SCALE: 1:1

Werkstoff:

Allgemeintoleranz / GENERAL TOLERANCE: DIN ISO 2768-m

Boehme + Ewert

Erstellt durch: Michael Boehme

Genehmigt von: Michael Böhme

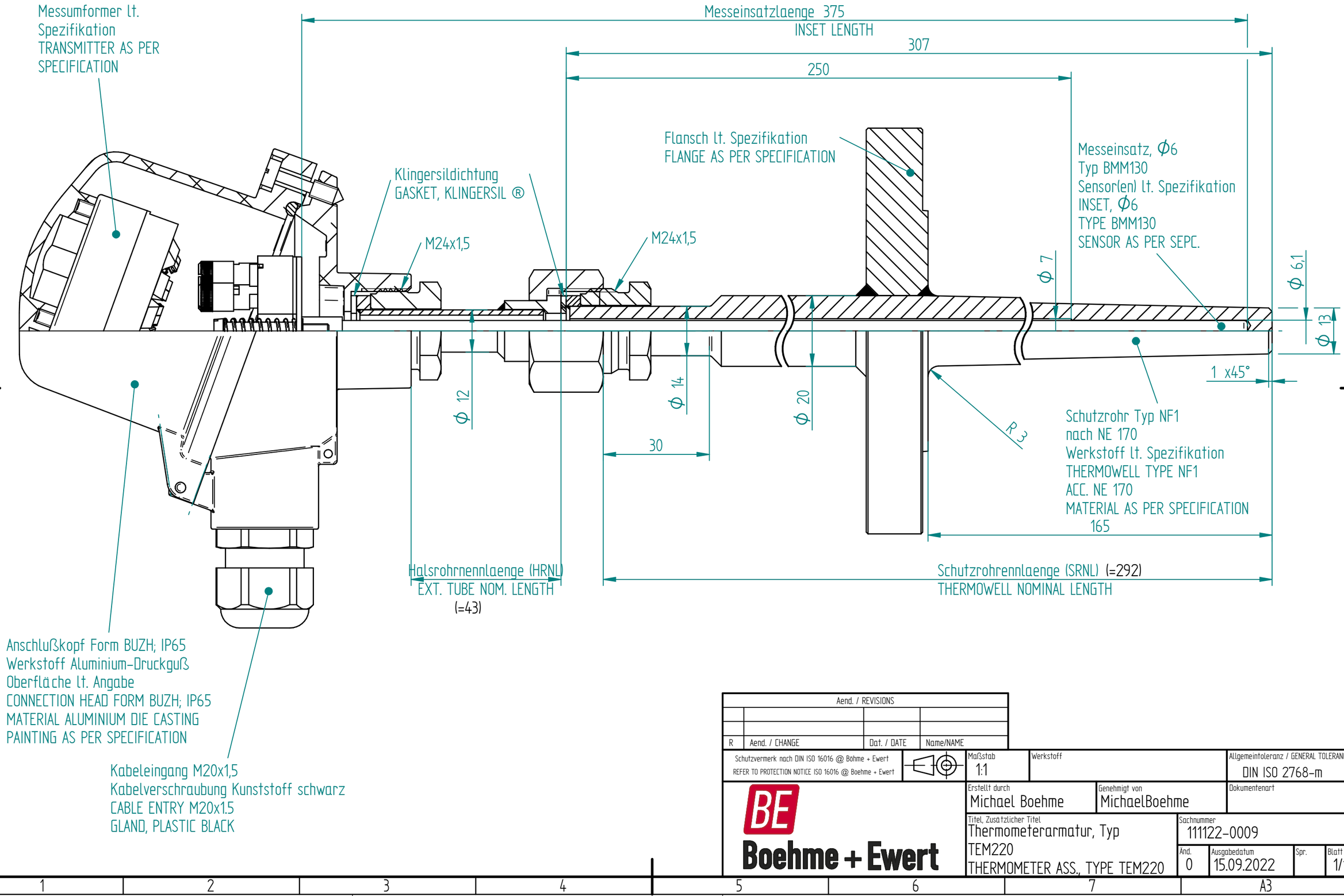
Dokumentenart:

Titel, Zusätzlicher Titel:
Thermometeramatur, Typ TEM230
THERMOMETER ASS., TYPE TEM230

Sachnummer: 111122-0007

And.	Ausgabedatum	Spr.	Blatt
0	19.08.2022		1

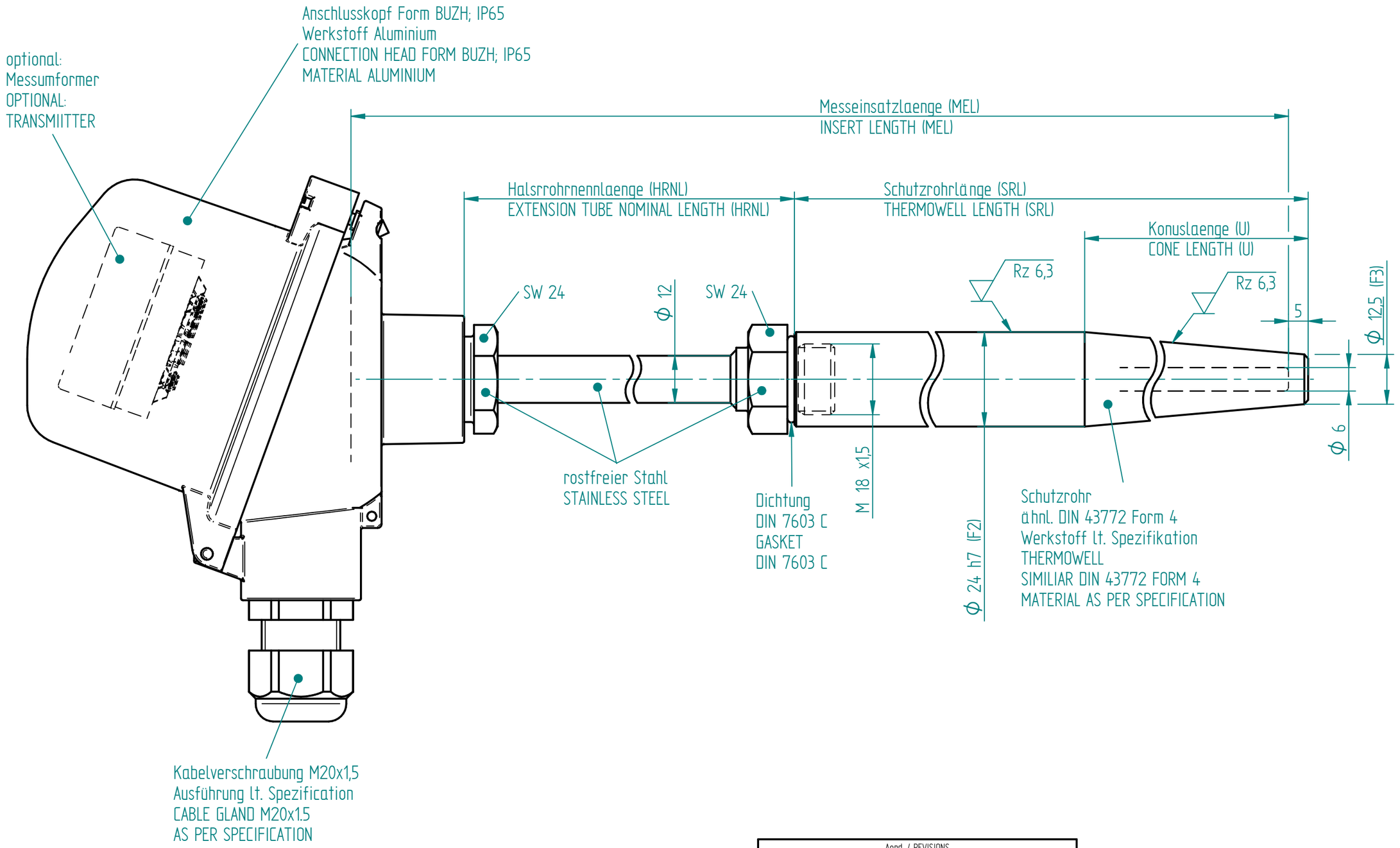
A2



Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Bohme + Ewert REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert	Maßstab 1:1	Werkstoff	Allgemeintoleranz / GENERAL TOLERANCE DIN ISO 2768-m
Boehme + Ewert	Erstellt durch Michael Boehme	Genehmigt von MichaelBoehme	Dokumentenart
	Titel, Zusatzlicher Titel Thermometerarmatur, Typ TEM220 THERMOMETER ASS., TYPE TEM220	Sachnummer 111122-0009	
		And.: 0 / Ausgabedatum: 15.09.2022 / Spr. / Blatt: 1/1	

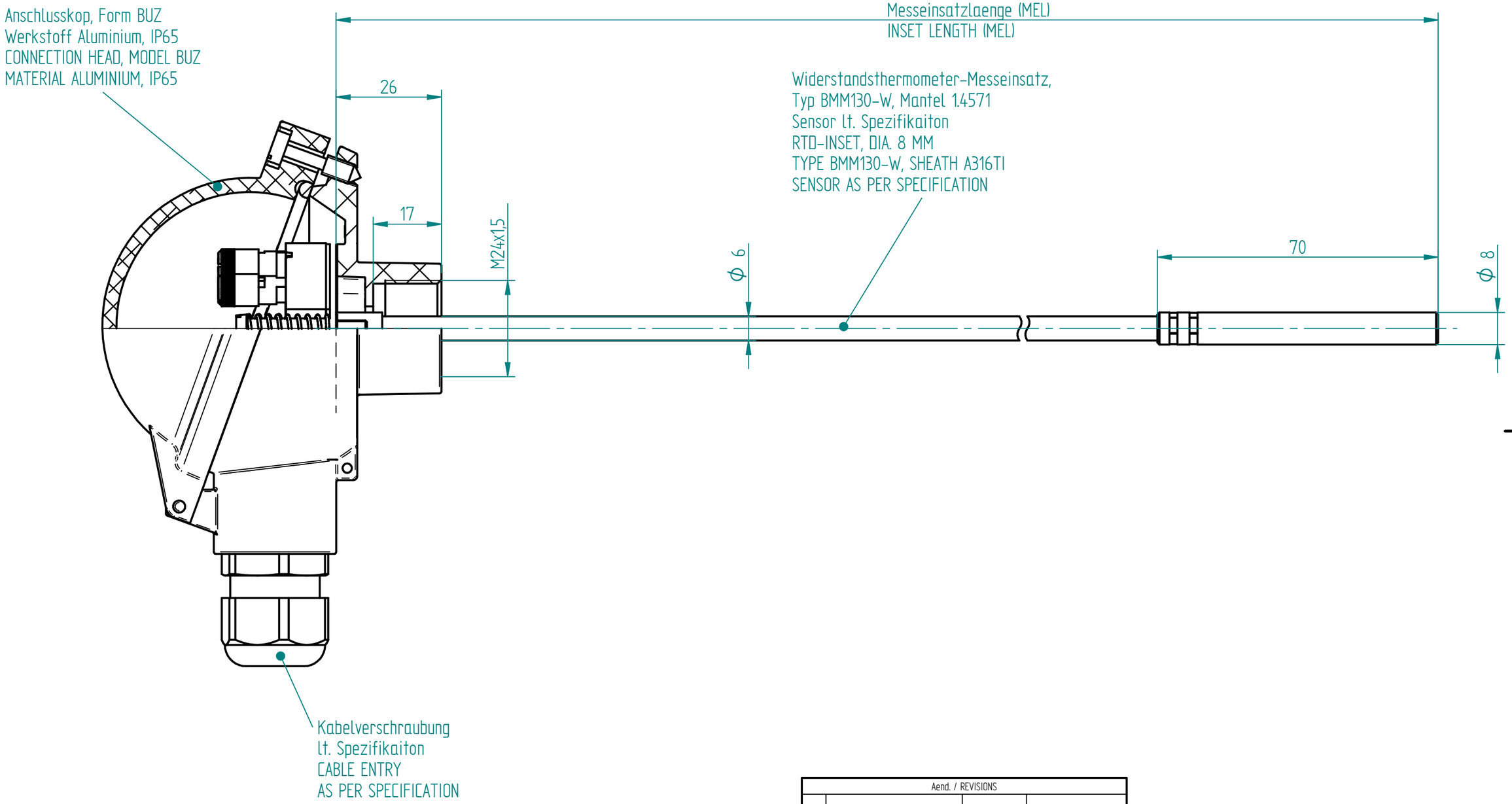
A3



Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert		Maßstab 1:1	Werkstoff	Allgemeintoleranz / GENERAL TOLERANCE DIN ISO 2768-m
Boehme + Ewert		Erstellt durch Michael Boehme	Genehmigt von MichaelBoehme	Dokumentenart
		Titel, Zusatzlicher Titel elektr. Thermometer, Typ TEM220 EL. THERMOMETER ASSEMBLY, TYPE TEM220		Sachnummer 111122-0017
				And. 0 / Ausgabedatum 07.03.2024 / Spr. / Blatt 1/1

A3



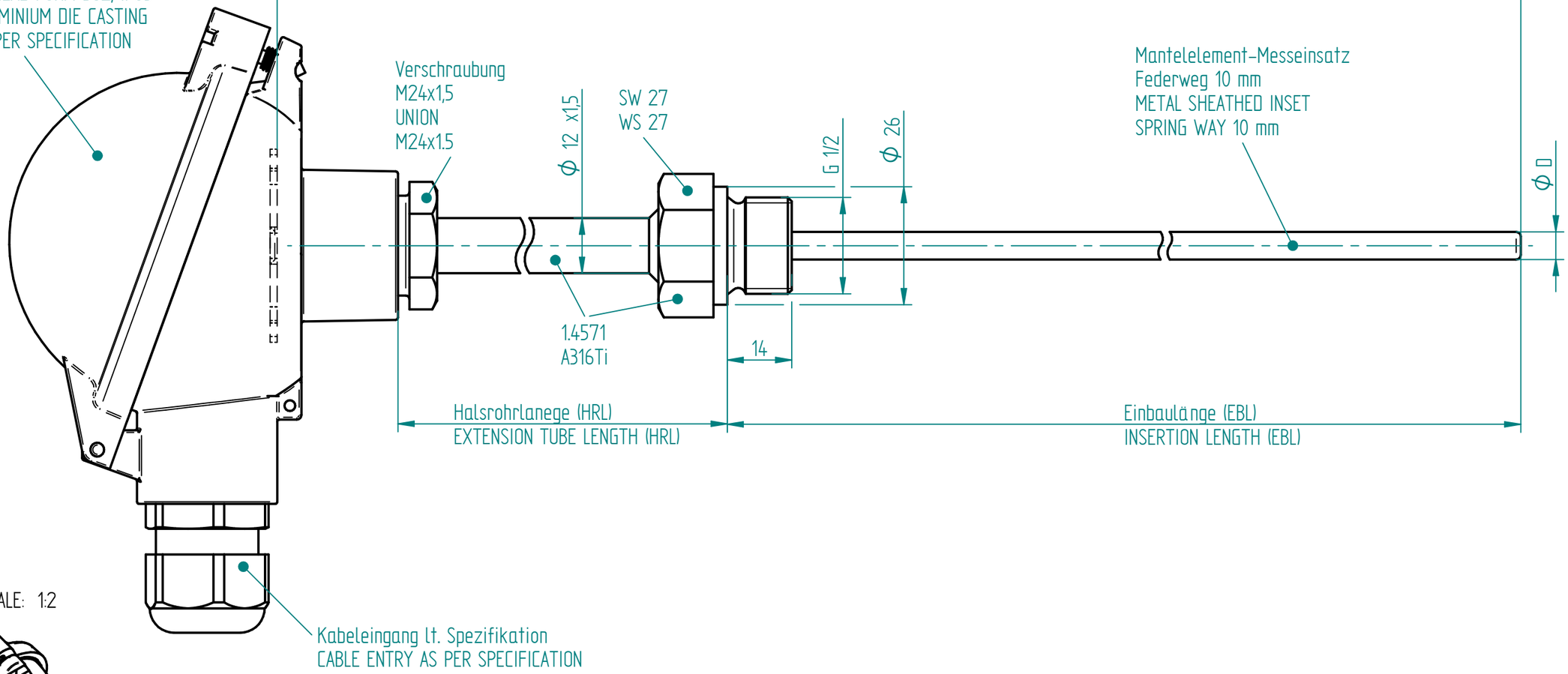
Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert
REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert

Boehme + Ewert

Maßstab: 1:1	Werkstoff:	Allgemeintoleranz / GENERAL TOLERANCE: DIN ISO 2768-m	
Erstellt durch: MichaelBoehme	Genehmigt von: Michael Böhme	Dokumentenart:	
Titel, Zusatzlicher Titel: WTH-Armatur, Typ TEM31 RTD-ASSEMBLY, TYPE TEM31		Sachnummer: 111131-0001	
		Änd.: 0	Ausgabedatum: 16.11.2022
		Spr.:	Blatt: 1/1

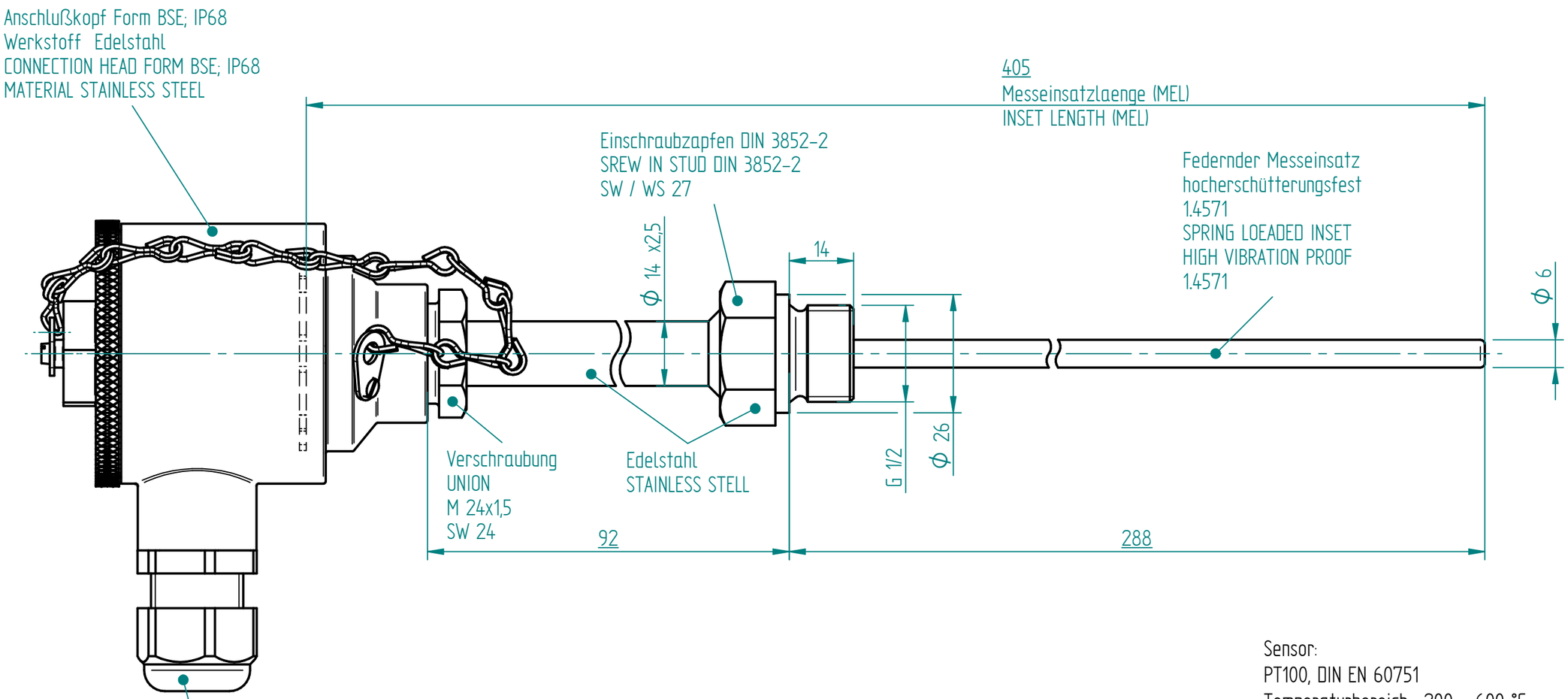
A3

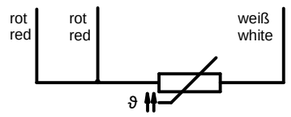


Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert	Maßstab 1:1	Werkstoff	Allgemeintoleranz / GENERAL TOLERANCE DIN ISO 2768-m
Boehme + Ewert	Erstellt durch Michael Boehme	Genehmigt von MichaelBoehme	Dokumentenart
	Titel, Zusatzlicher Titel Widerstandsthermometer, Typ TEM32 RTD ASSEMBLY TYPE TEM32	Sachnummer 111132-0005	
		And.: 0 / Ausgabedatum: 23.05.2022 / Spr. / Blatt: 1/1	

A3





Sensor:
PT100, DIN EN 60751
Temperaturbereich -200 - 600 °C
Toleranz Klasse A -200 - 200 °C
3-Leiter-Schaltung
TEMPERATURE RANGE -200 - 600 °C
TOLERANCE CLASS A -200 - 200 °C
3-WIRE-CONNECTION

Ex i (a,b) nach ATEX
Ex i (a,b) ACC. ATEX

Hinweis:
Unterstichene Maßangaben nicht maßstäblich!
Hint:
Underlined dimensions not to scale!

Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Bohme + Ewert
REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert

Boehme + Ewert

Maßstab 1:1	Werkstoff		Allgemeintoleranz / GENERAL TOLERANCE DIN ISO 2768-m
Erstellt durch Michael Boehme	Genehmigt von MichaelBoehme		Dokumentenart
Titel, Zusatzlicher Titel Widerstandsthermometer, Typ TEM32 RTD ASSEMBLY TYPE TEM32			Sachnummer 111132-00013
		Änd. 0 / Ausgabedatum 29.07.2022 / Spr. / Blatt 1/1	

A3

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

Messeinsatzlaenge (MEL)
INSET LENGTH (MEL)

M24x1,5

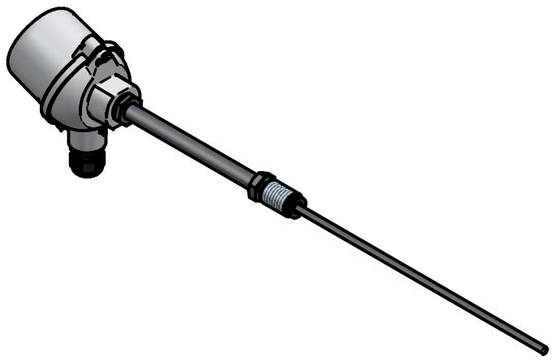
1.4571
A316Ti

Verschraubung
SW 22, Edelstahl
UNION
WRENCH SIZE 22; SS

Mantelelement-Messeinsatz
lt. Spezifikation
METAL SHEATHED INSET
AS PER SPECIFICATION

Kabelverschraubung
M20x1,5
CABLE GLAND
M20x1.5

ca. / APPR. 110



Längenreferenz für T = 73		
EBL	MEL	passend für U
155	380	100
205	430	150
255	480	200
305	530	250
355	580	300
405	630	350
455	680	400
505	730	450

Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert
REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert

Maßstab: 1:1

Werkstoff:

Allgemeintoleranz / GENERAL TOLERANCE: DIN ISO 2768-m

Boehme + Ewert

Erstellt durch: Michael Boehme

Genehmigt von: MichaelBoehme

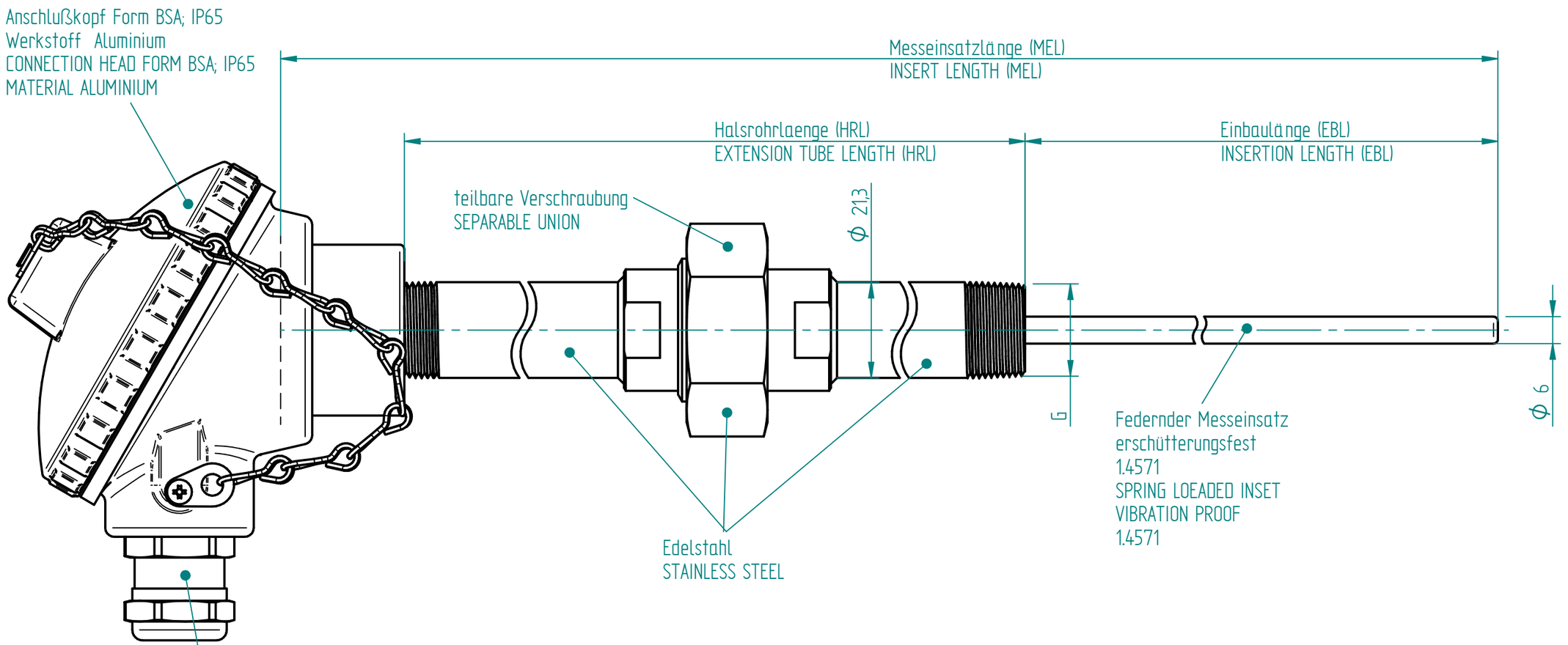
Dokumentenart:

Titel, Zusatzlicher Titel:
Thermometer, Typ TEM32
T.-ASSEMBLY, TYPE TEM32

Sachnummer: 111132-0015

Änd.	Ausgabedatum	Spr.	Blatt
0	13.02.2023		1/1

A3



Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Bohme + Ewert
REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert

Boehme + Ewert

Maßstab: 1:1	Werkstoff:	Allgemeintoleranz / GENERAL TOLERANCE: DIN ISO 2768-m	
Erstellt durch: Michael Boehme	Genehmigt von: MichaelBoehme	Dokumentenart:	
Titel, Zusatzlicher Titel: Elektr. Thermometer, Typ TEM32 EL. THERMOMETER, TYPE TEM32		Sachnummer: 111132-0017	
		Änd.: 0 / Ausgabedatum: 12.02.2024 / Spr.: / Blatt: 1/1	

A3

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

Messeinsatzlaenge (MEL)
INSET LENGTH (MEL)

Flansch lt. Spezifikation
FLANGE AS PER SPECIFICATION

Gewindemuffe gasdicht,
Werkstoff rostfreier Stahl
BUSHING, GAS TIGHT
STAINLESS STEEL

Werkstoff lt. Spezifkation
MATERIAL AS PER SPECIFICATION

Messeinsatz, Φ8
2xPT100; 3-Leiter, Klasse B
Mantel 1.4571
INSET, Φ8
2xPT100; 3-WIRE, CLASS B
SHEATH A316

M24x1,5

Dichtring
SEAL RING

G 1

Φ 25 x2

6

Φ 15

Φ 8,5

50

60

ca. / APPR. 77,89

Nennlaenge (NL)
NOMINAL LENGTH (NL)

Kabeleingang lt. Spezifikation
CABLE ENTRY AS PER SPECIFICATION

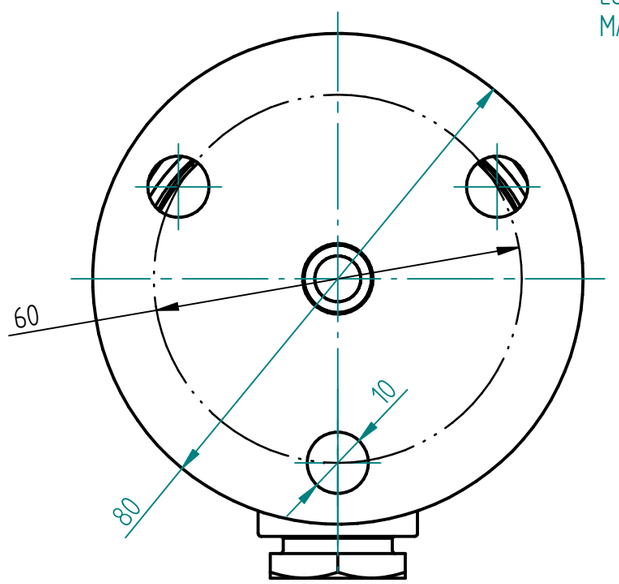
Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert
REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert

Maßstab: 1:1	Werkstoff:	Allgemeintoleranz / GENERAL TOLERANCE: DIN ISO 2768-m	
Erstellt durch: Michael Boehme	Genehmigt von: SergejEwert	Dokumentenart:	
Titel, Zusatzlicher Titel: Thermometerarmatur, Typ TEM110 THERMOMETER ASS., TYPE TEM110		Sachnummer: 1111111-0009	
		And.: 0	Ausgabedatum: 30.10.2022
		Spr.:	Blatt: 1/1

Boehme + Ewert

A3



Anschlußkopf Form B; IP65
Werkstoff Aluminium-Druckguß
CONNECTION HEAD FORM B; IP65
MATERIAL ALUMINIUM DIE CASTING

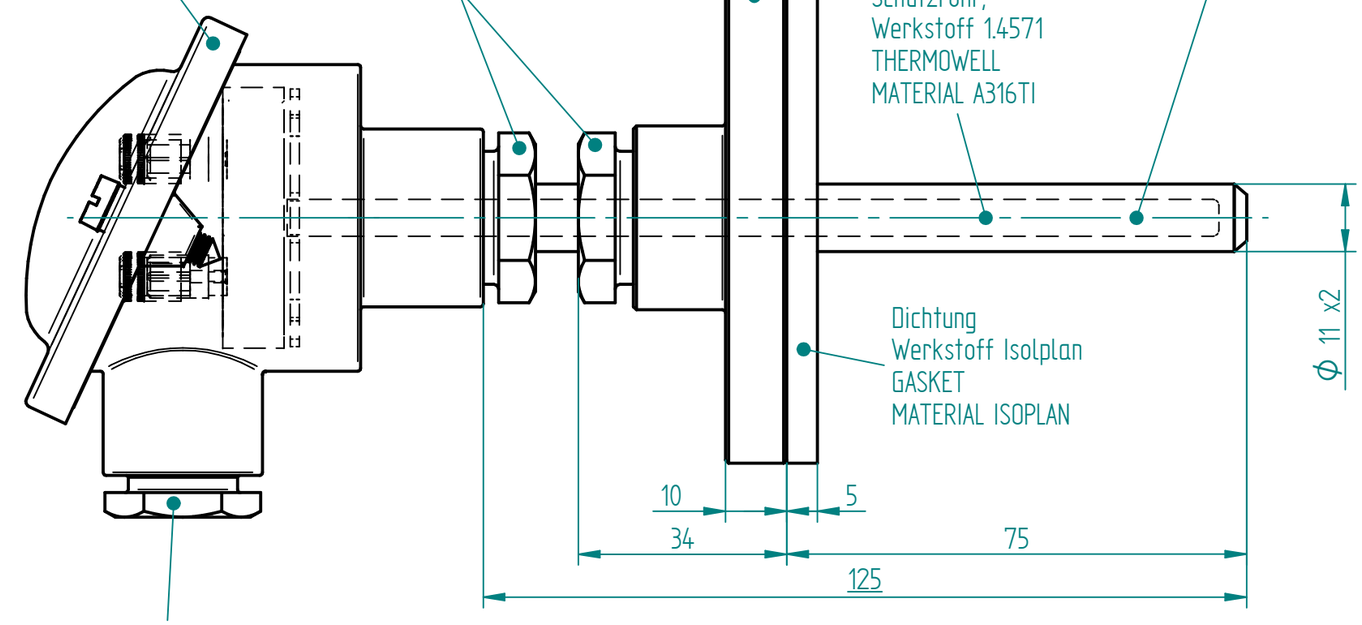
Verschraubungen
M24x1,5; rostfreier Stahl
UNIONS
M24X1.5; STAINLESS STEEL

Spannflansch,
rostfreier Stahl
CLAMPING FLANGE
STAINLESS STEEL

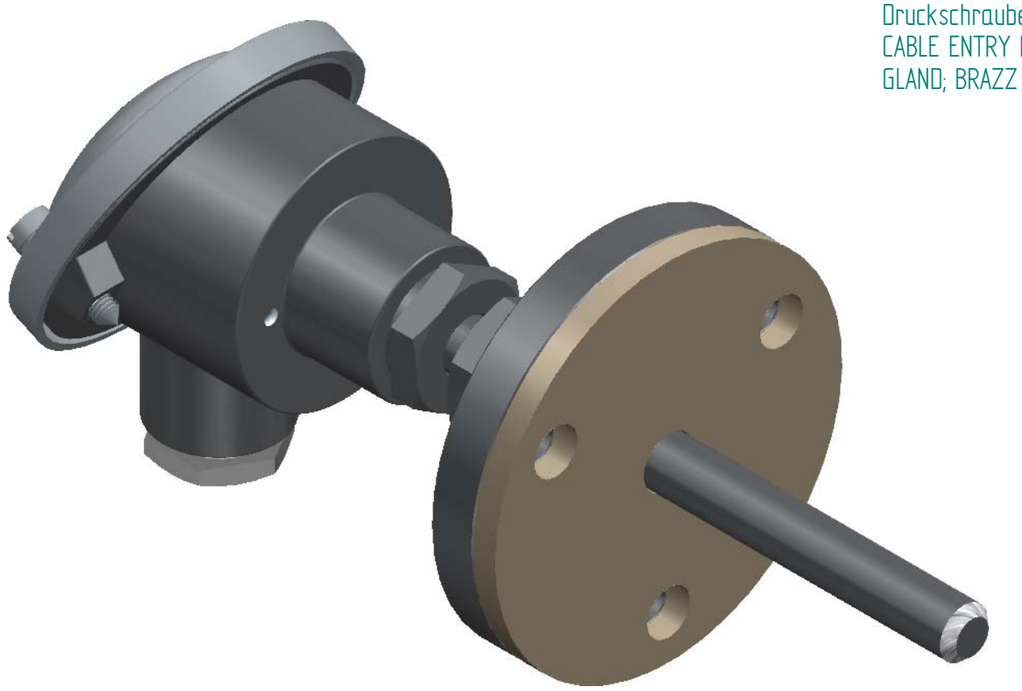
Messeinsatz, Typ BMM130
Φ6 mm
PT100, Klasse B, 2-Leiterschaltung
INSET, TYPE BMM130
Φ6 MM
PT100, CLASS B, 2-WIRE-CONNECTION

Schutzrohr,
Werkstoff 1.4571
THERMOWELL
MATERIAL A316TI

Dichtung
Werkstoff Isolplan
GASKET
MATERIAL ISOPLAN



Kabeleingang M20x1,5
Druckschraube; Messing vernickelt
CABLE ENTRY M20X.5
GLAND; BRAZZ NICKEL PLATED



Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert
REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert

Maßstab: 1:1
Werkstoff:
Allgemeintoleranz / GENERAL TOLERANCE

Boehme + Ewert

Erstellt durch: Michael Boehme
Genehmigt von: MichaelBoehme
Dokumentenart:

Titel, Zusätzlicher Titel:
Thermometerarmatur, Typ TEM110
THERMOMETER ASS., TYPE TEM110

Sachnummer: 1111111-0011

And.	Ausgabedatum	Spr.	Blatt
0	03.02.2023		1/1

A3

Anschlußkopf Form BUZHPA; IP65
Werkstoff Polyamid, schwarz
CONNECTION HEAD FORM BUZHPA; IP65
MATERIAL POLYAMIDE, BLACK

Messeinsatzlaenge (MEL) (= NL + 25)
INSET LENGTH (MEL)

Flansch lt. Spezifikation
FLANGE AS PER SPECIFICATION

Messeinsatz
ϕ6
INSET
ϕ6

ϕ 16 x 2,5

5

ϕ 12

ϕ 6,5

50

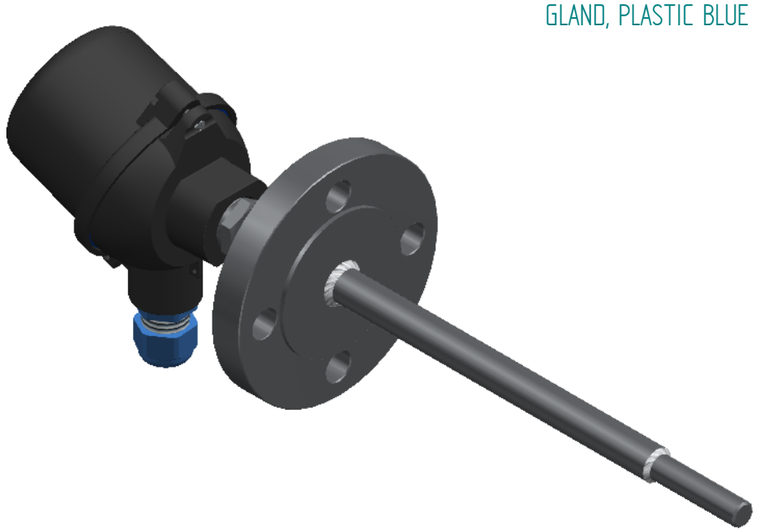
M 24x1,5

Werkstoff lt. Spezifkation
MATERIAL AS PER SPECIFICATION

Einbaulaenge (EBL)
INSERTION LENGTH (EBL)

Nennlaenge (NL)
NOMINAL LENGTH (NL)

Kabeleingang M20x1,5
Kabelverschraubung, Kunststoff blau
CABLE ENTRY M20x1.5
GLAND, PLASTIC BLUE



Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert
REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert

Maßstab: 1:1
Werkstoff:
Allgemeintoleranz / GENERAL TOLERANCE: DIN ISO 2768-m

Boehme + Ewert

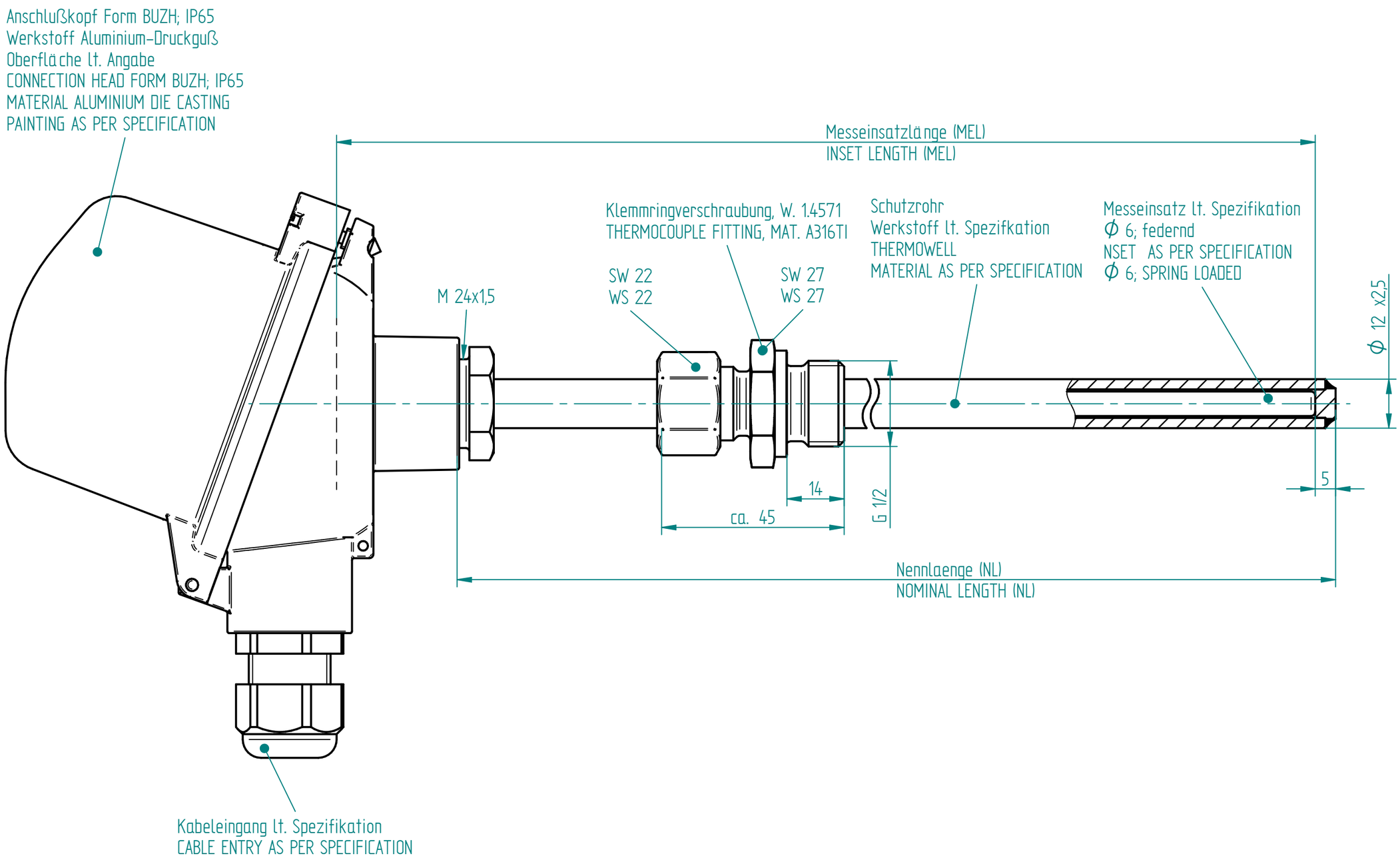
Erstellt durch: Michael Boehme
Genehmigt von: MichaelBoehme
Dokumentenart:

Titel, Zusätzlicher Titel:
Thermometer Armtat., Typ TEM110
THERMOMETER ASS., TYPE TEM110

Sachnummer: 1111111-0012

And.	Ausgabedatum	Spr.	Blatt
0	22.02.2023		1/1

A3



Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert
REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert

Maßstab: 1:1

Werkstoff:

Allgemeintoleranz / GENERAL TOLERANCE: DIN ISO 2768-m

Boehme + Ewert

Erstellt durch: Michael Boehme

Genehmigt von: MichaelBoehme

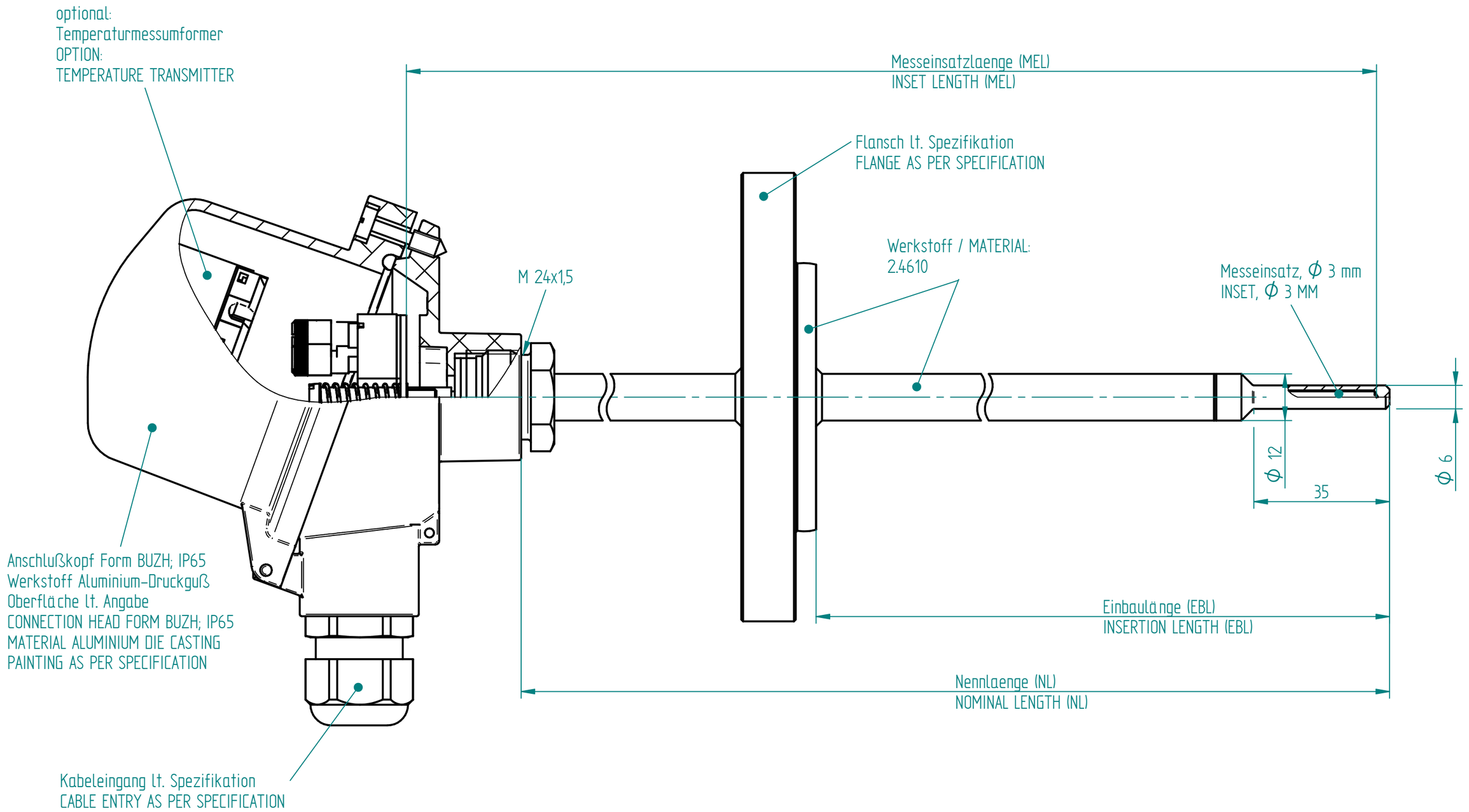
Dokumentenart:

Titel, Zusätzlicher Titel: Thermometerarmatur, Typ TEM110
THERMOMETER ASS., TYPE TEM110

Sachnummer: 1111111-0013

And.	Ausgabedatum	Spr.	Blatt
0	05.04.2023		1/1

A3



Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert
REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert

Maßstab: 1:1

Werkstoff:

Allgemeintoleranz / GENERAL TOLERANCE: DIN ISO 2768-m

Boehme + Ewert

Erstellt durch: Michael Boehme

Genehmigt von: MichaelBoehme

Dokumentenart:

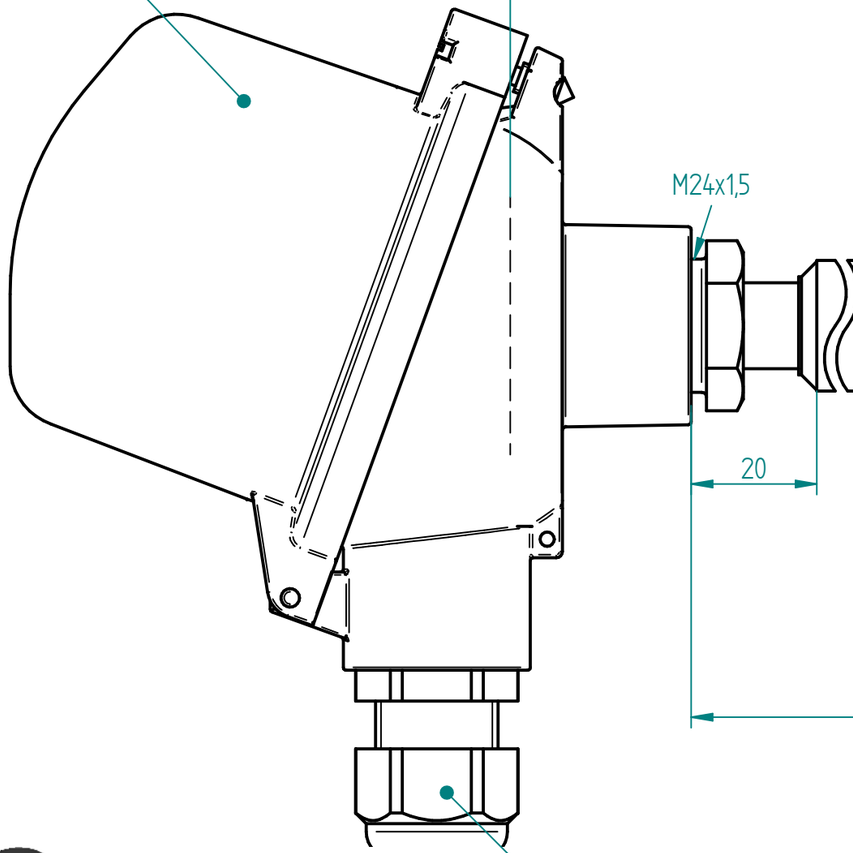
Titel, Zusätzlicher Titel: Thermometerarmatur, Typ TEM110
THERMOMETER ASS., TYPE TEM110

Sachnummer:

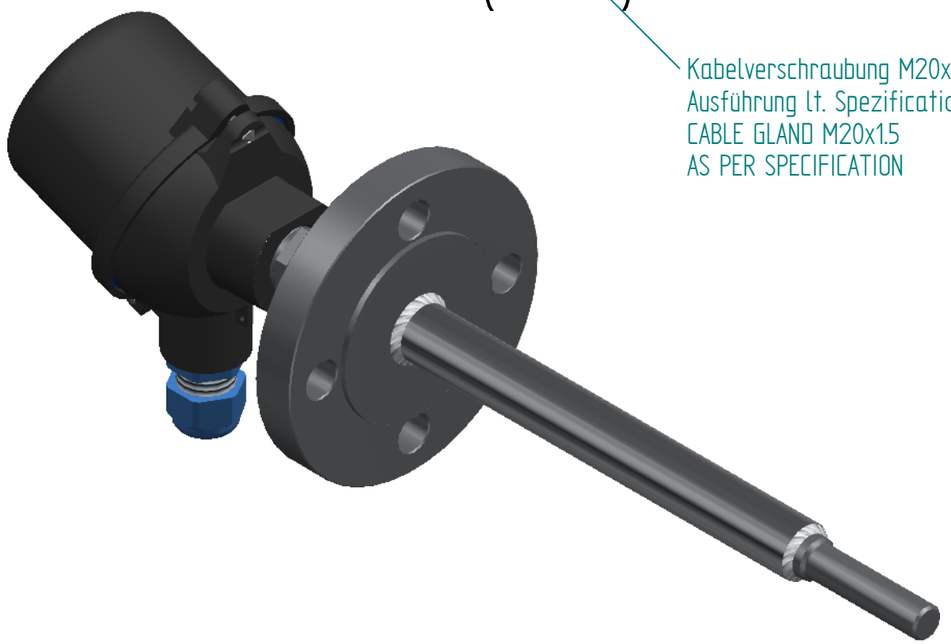
And.	Ausgabedatum	Spr.	Blatt
0	15.06.2023		1/1

A3

Anschlusskopf Form BUZHPA; IP65
Werkstoff Polyamid schwarz
CONNECTION HEAD FORM BUZHPA; IP65
MATERIAL POLYAMIDE, BLACK



Kabelverschraubung M20x1,5
Ausführung lt. Spezification
CABLE GLAND M20x1.5
AS PER SPECIFICATION



Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert
REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert

Maßstab: 1:1
Werkstoff:
Allgemeintoleranz / GENERAL TOLERANCE: DIN ISO 2768-m

Boehme + Ewert

Erstellt durch: MichaelBoehme
Genehmigt von: MichaelBoehme
Dokumentenart:

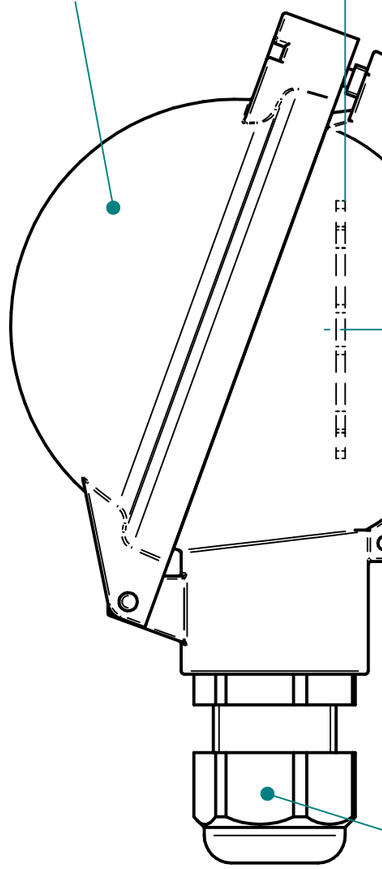
Titel, Zusätzlicher Titel:
Thermometerarmatur, Typ TEM110
THERMOMETER ASS., TYPE TEM110

Sachnummer: 1111111-0016

And.	Ausgabedatum	Spr.	Blatt
0	16.01.2024		1/1

A3

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



Messeinsatzlaenge (MEL) (= NL + 25)
INSERT LENGTH (MEL)

M 24x1,5

SW 27
WS 27

14

G 1/2

Messeinsatz; ϕ6 mm
INSET; ϕ 6 MM

4,5

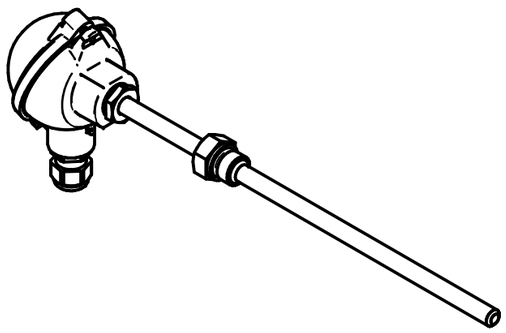
ϕ 12 x2,5

Werkstoff lt. Spezifkation
MATERIAL AS PER SPECIFICATION

Einbaulaenge (EBL)
INSERTION LENGTH (EBL)

Nannlaenge (NL)
NOMINAL LENGTH (NL)

Kabeleingang lt. Spezifikation
CABLE ENTRY AS PER SPECIFICATION



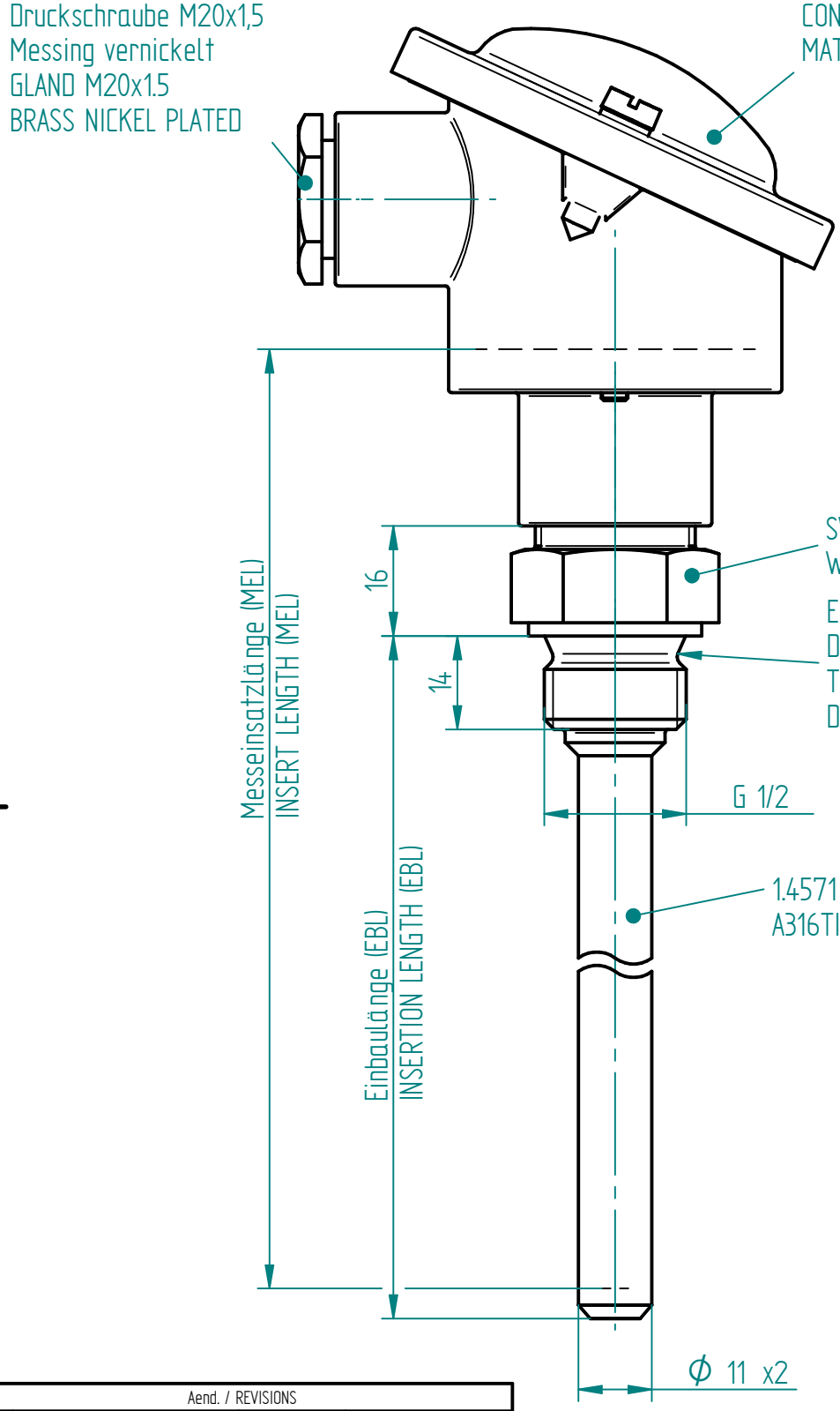
Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert
REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert

Boehme + Ewert

Maßstab: 1:1	Werkstoff:		Allgemeintoleranz / GENERAL TOLERANCE: DIN ISO 2768-m
Erstellt durch: Michael Boehme	Genehmigt von: MichaelBoehme		Dokumentenart:
Titel, Zusätzlicher Titel: El. Thermometer, Type TEM110 EL. THERMOMETER ASS., TYPE TEM110			Sachnummer: 1111111-0017
Änd.: 0	Ausgabedatum: 03.04.2024	Spr.:	Blatt: 1/1

A3



Messeinsatz, Du. 6 mm
lt. Spezifikation
INSERT, DIA. 6 MM
AS PER SPECIFICATION

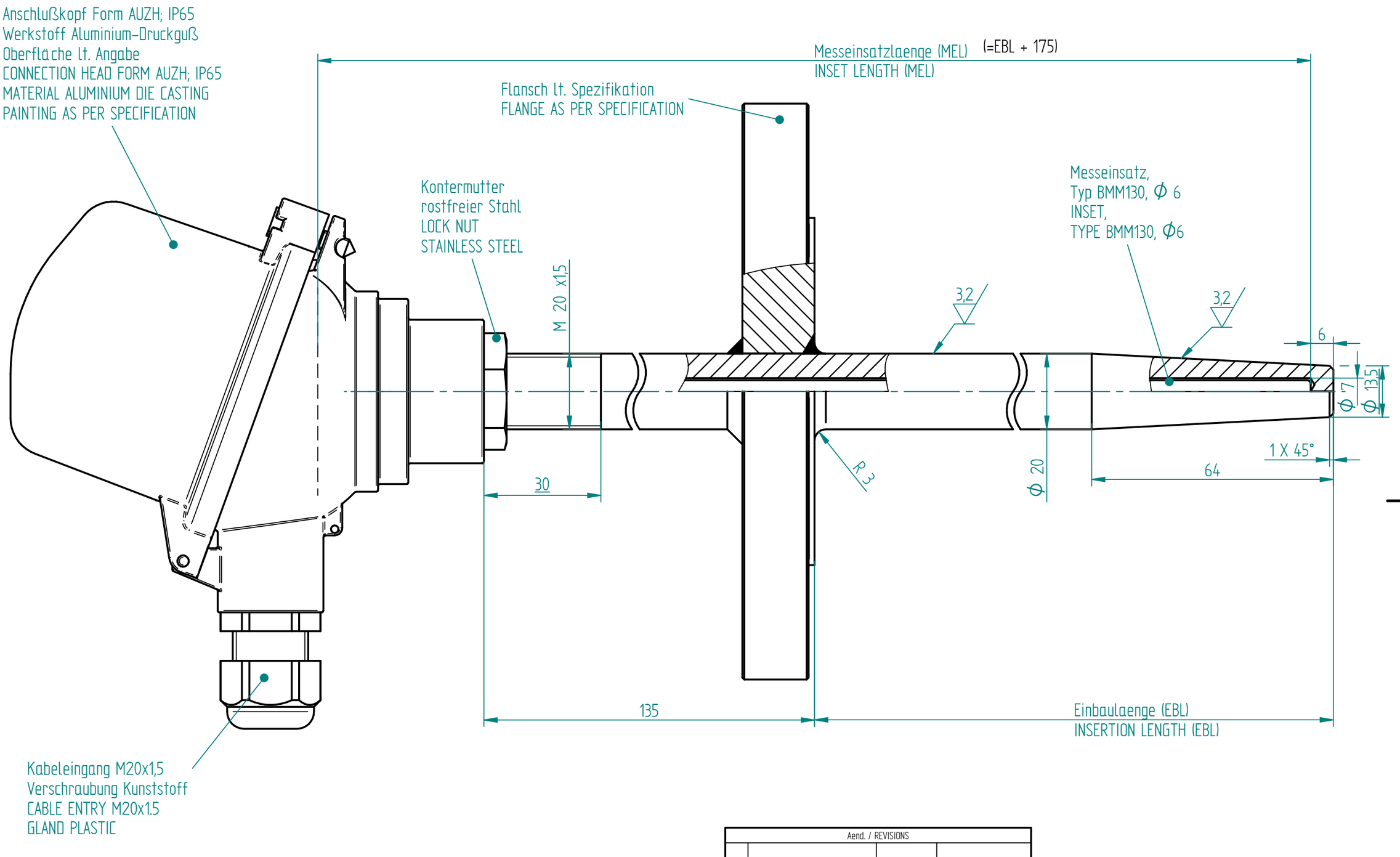
Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert	ISO 128	Maßstab 1:1	Werkstoff	Allgemeintoleranz / GENERAL TOLERANCE DIN ISO 2768-m

Boehme + Ewert

Erstellt durch Michael Boehme	Genehmigt von Michael Boehme	Dokumentart
Titel, Zusätzlicher Titel Thermometer, Typ TEM111 THERMOMETER ASS., TYPE TEM111	Sachnummer 1111112-0003	

Änd.		Spr.	Blatt
0	22.11.2023		1



Aend. / REVISIONS			
R	Aend. / CHANGE	Dat. / DATE	Name/NAME

Schutzvermerk nach DIN ISO 16016 @ Böhme + Ewert
REFER TO PROTECTION NOTICE ISO 16016 @ Boehme + Ewert

Maßstab: 1:1

Werkstoff:

Allgemeintoleranz / GENERAL TOLERANCE: DIN ISO 2768-m

Boehme + Ewert

Erstellt durch: Michael Boehme

Genehmigt von: MichaelBoehme

Dokumentenart:

Titel, Zusatzlicher Titel: Thermometerarmatur, Typ TEM120
THERMOMETER ASS., TYPE TEM120

Sachnummer: 1111121-0006

Änd.	Ausgabedatum	Spr.	Blatt
0	28.04.2023		1/1

A3