

# Electrodes 1004

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## Table of contents

### Index

Table of contents	102
Description and function	103
Certificates / Approvals	104
<b>Electrodes 1004</b>	
Stainless steel and Brass electrode	105
Stainless steel/Brass	106
High pressure electrodes	107
<b>Type key</b>	<b>108-109</b>

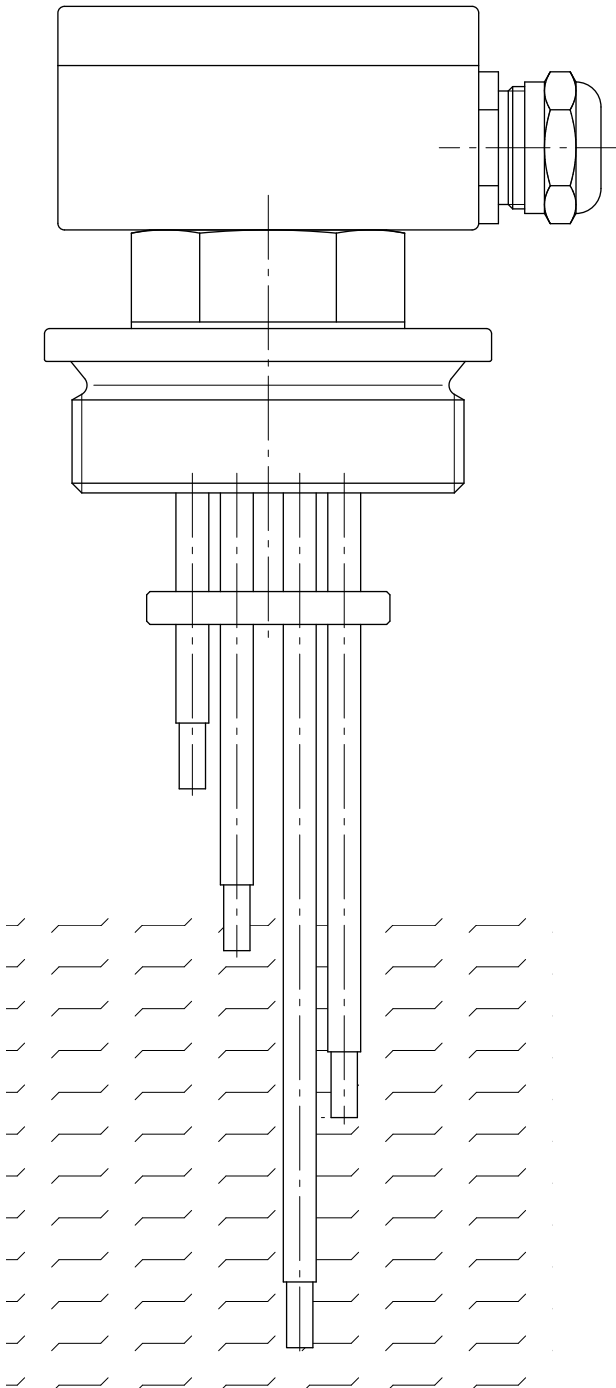
### Instructions for instrument selection in the catalogue

So that the customer gets the best equipment solution according to his requirements, we recommend this simple procedure using the following pages:

- Define the dimension of the fitting or interface (e.g. thread G2", DIN-flange DN25/PN16, etc.)
- Determine the electrical connection (e.g. terminal box, cable entry, plug, etc.)
- Find out the operating conditions, min. and max. operating pressure, temperature and specific gravity of the media at the max. operating temperature.
- With the size of the fitting and material of the instrument, a guide specification can be selected on pages 105 to 107.
- The full and final specification can now be generated by reference to the „type key“ on pages 108 to 109.
- With the type description and the technical operating conditions a price quotation can be made or the instrument can be ordered.
- Specification of the requested approval.

# Electrodes 1004

## Description and function



Electrodes are electrically conducting rods that can be used to monitor and control filling levels. They work on the principle of conduction in association with level controllers (see chapter 1011). If the electrodes are immersed in an electrically conducting liquid, the resulting current activates high-voltage, potential-free, relay contacts via a signal amplifier.

The signal-current circuit is isolated from the main power supply and is operated using protective low voltage. In order to prevent electrolytic action at the electrodes, the latter are operated with alternating voltage. Depending on the type of electrode and level controller used, these controllers are suitable for:

- high alarm
- low alarm
- full and empty pumping
- control with latching (self-locking)
- opening / closing valves with latching and dry-run protection

### Use

Electrode controllers can be used in electrically conducting liquids such as, for example, milk, fruit juice, beer, water, waste water, acids, alkalis, etc.

### Application

- food industry
- engineering industry
- construction of air conditioning systems
- heating systems
- household appliances
- water treatment
- construction of vehicles
- etc.

### Advantages

- no mechanical moving components
- compact construction
- independent of specific gravity
- suitable for different pressures and temperatures, depending on design
- very efficient price-performance ratio

# Electrodes 1004

## Certificates / Approvals

### Certificates



#### **SCHWEIZERISCHER VEREIN FÜR QUALITÄTS- UND MANAGEMENTSYSTEME**

Certified according to ISO 9000 rev. 2000



#### **SWISS TECHNICAL SERVICES AG**

Approval as production factory, welding examination and procedure qualification incl. restamping certificate for the production of pressure tanks according to SVTI-regulation 501, 201

### Approvals



The company Heinrich Kübler AG can manufacture electrodes to most approvals. Therefore a wide range of instruments with approvals requirements can be produced acc. to customer's requests.

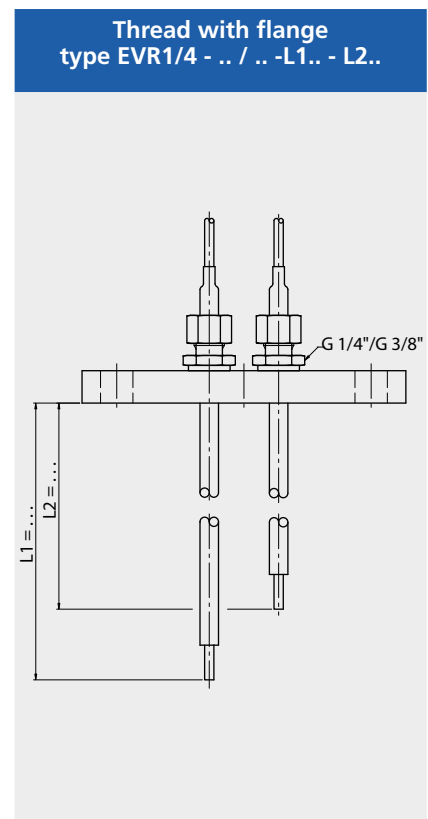
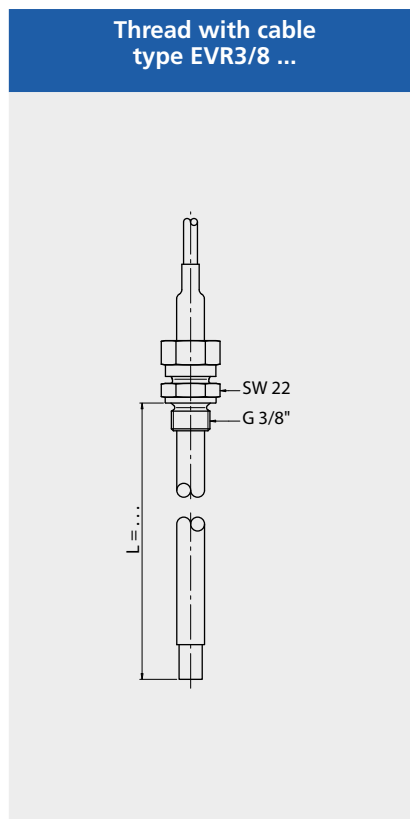
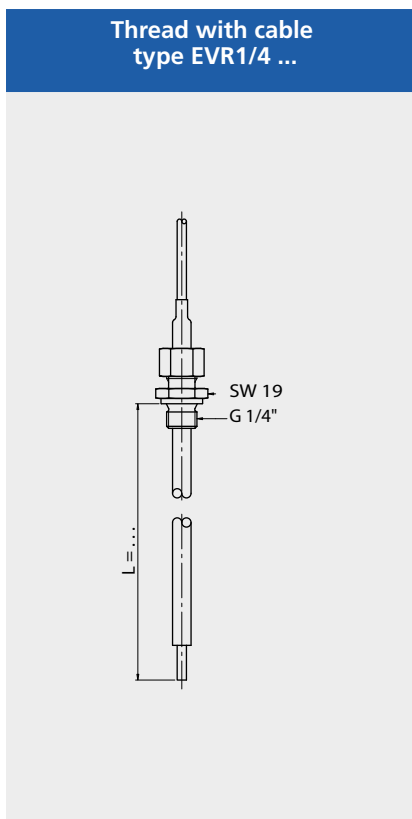
#### **TECHNISCHER ÜBERWACHUNGSVEREIN DEUTSCHLAND (PED)**

Approval as production factory for manufacture of pressure tanks acc. to AD HP 0 and acc. to PED Pressure Equipment Directive 97/23/EG

# Electrodes 1004

## Stainless steel and Brass electrode

Technical data	Stainless steel	Brass
Connection sizes:	Thread BSP ¼" ... Thread NPT ¼" ... Flange DIN DN15 .. Flange Ansi ½" ...	Thread BSP ¼" ... Thread NPT ¼" ...
Electrode material:	Stainless steel Titanium (oper.temp. -10 °C)	Stainless steel
Diameter of electrode:	4 mm length to 3000 mm 10 mm length to 3000 mm	4 mm length to 3000 mm 10 mm length to 3000 mm
Quantity of electrode:	1 piece	1 piece
Isolation:	PTFE	PTFE
Thickness of isolation:	2 mm	2 mm
Approvals:	See approvals page 104	See approvals page 104
Operating parameters:	Oper.temp.: -160 °C ... +250 °C Pressure: -1 ... 2 bar PVC cable temp.: -15 °C ... +80 °C Sil cable temp.: -30 °C ... +180 °C (Ambient temp. cable)	Oper.temp.: -30 °C ... +150 °C Pressure: -1 ... 2 bar PVC cable temp.: -15 °C ... +100 °C Sil cable temp.: -30 °C ... +180 °C (Ambient temp. cable)

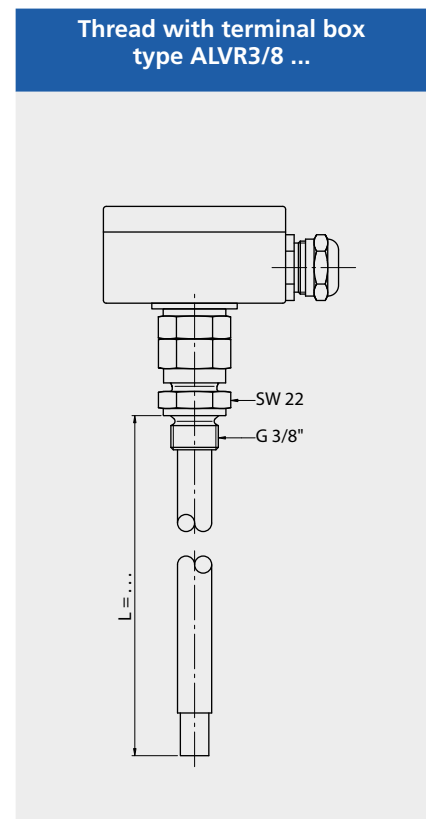
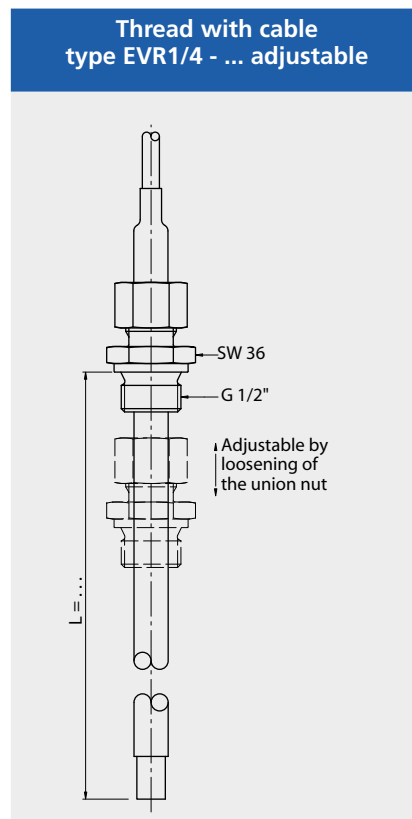
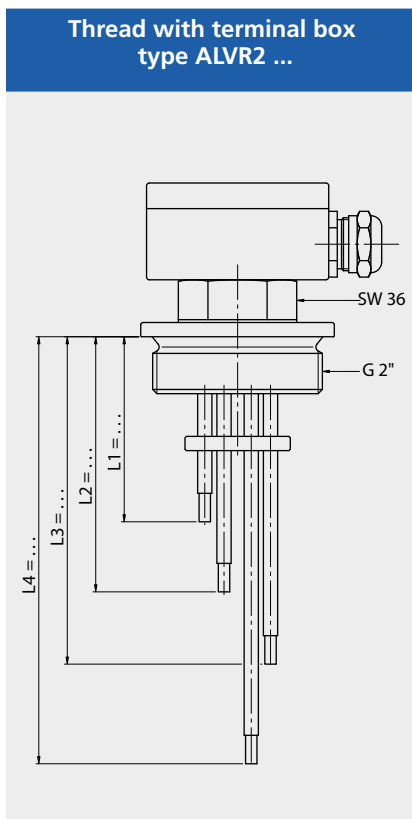


Type combination see type key Electrodes

# Electrodes 1004

## Stainless steel / Brass

Technical data	Stainless steel	Brass
Connection sizes:	Thread BSP ¼" ... Thread NPT ¼" ... Flange DIN DN15 ... Flange Ansi ½" ...	Thread BSP ¼" ... Thread NPT ¼" ...
Electrode material:	Stainless steel Titanium (oper.temp. -10 °C)	Stainless steel
Diameter of electrode:	4 mm length to 3000 mm 10 mm length to 3000 mm	4 mm length to 3000 mm 10 mm length to 3000 mm
Quantity of electrode:	1 piece	1 piece
Isolation:	PTFE	PTFE
Thickness of isolation:	2 mm	2 mm
Approvals:	See approvals page 104	See approvals page 104
Operating parameters:	Oper.temp.: -160 °C ... +250 °C Pressure: -1 ... 2 bar PVC cable temp.: -15 °C ... +80 °C Sil cable temp.: -30 °C ... +180 °C (Ambient temp. cable)	Oper.temp.: -30 °C ... +150 °C Pressure: -1 ... 2 bar PVC cable temp.: -15 °C ... +80 °C Sil cable temp.: -30 °C ... +150 °C (Ambient temp. cable)



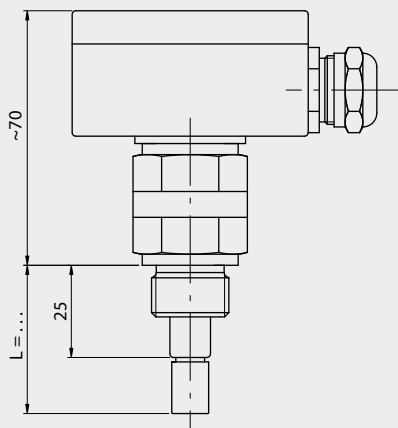
Type combination see type key Electrodes

# Electrodes 1004

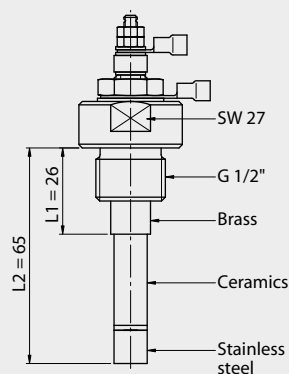
## High pressure electrodes

Technical data	BERU - ALVR1/2 - L ...	EPFR1/2 - V2 - EPFR1/2 - M2
Connection sizes:	Thread BSP 1/2"	Thread BSP 1/2"
Connection material:	Stainless steel	Polyvinylidenfluoride
Electrode material:	Stainless steel	Stainless steel Brass
Diameter of electrode:	10 mm length to 1000 mm	10 mm length L1 = 26 mm L2 = 65 mm
Quantity of electrode:	1 piece	2 pieces
Isolation:	Ceramics	Ceramics
Pressure:	0 ... 100 bar	0 ... 10 bar
Temperature:	0 ... +80 °C	0 ... +135 °C
Thickness of isolation:	3 mm	2 mm
Approvals:	-	-
Media:	Conductive	Conductive

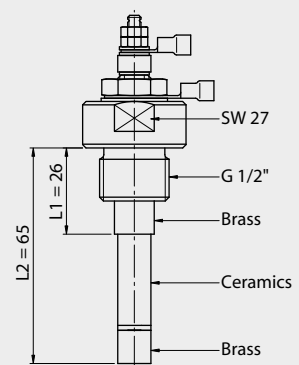
Terminal box with thread type BERU - ALVR1/2 - L ...



Thread with ring terminal type EPFR1/2 - V2



Thread with ring terminal type EPFR1/2 - M2



Type combination see type key Electrodes

# Electrodes 1004

## Type key

Code 1	Key 1	Electrical connection	ATEX
	AL ... -	Aluminium terminal box	
	AV ... -	Stainless steel terminal box	
	ALDC ... -	Aluminium terminal box EExd explosion proof	
	ALD ... -	Aluminium terminal box EExd explosion proof	
	AVD ... -	Stainless steel terminal box EExd explosion proof	
	AP ... -	Terminal box Polyester	
	AB ... -	Terminal box ABS	
	AS ... -	Connection plug	
	AF -	Connection plug with PA-flange	
	E -	Connection cable	
	... -	Various	
	Key 2	Material of process connection	ATEX
	.. V .. -	Stainless steel	
	.. Ti .. -	Titanium	
	.. H .. -	Alloy	
	.. S .. -	Steel	
	.. M .. -	Brass	
	.. A .. -	Aluminium	
	.. P .. -	Polyvinylchloride PVC	
	.. PP .. -	Polypropylene PP	
	.. PF .. -	Polyvinylidenfluoride PVDF	
	... -	Various	
	Key 3	Design process connection	ATEX
	... E -	Thread to the top DIN G ¼" ...	
	... E NPT ... -	Thread to the top NPT ¼" ...	
	... R ... -	Thread to the bottom DIN G ¼" ...	
	... NPT ... -	Thread to the bottom NPT ¼" ...	
	... BKNW ... -	Screwed connection according to DIN 11851, NW25 ...	
	... TC ... -	Tri-Clamp flange DN 25 ...	
	... F -	Flange according to different standards	
	... VE -	Various	

### Type combination

Code	1	2	3	4	5
Key	1/2/3	1/1/1	1	1	1
Example	EPPF -	25/10/C	V -	L1 ... -	SIL



# Electrodes 1004

## Type key

<b>Code 2</b>	<b>Key 1</b>	<b>Flange dimensions and designs</b>	<b>ATEX</b>
	.. / .. / .. -	Standard 1. nom.width 2. nom.pressure 3. form DIN DN 15 ... 500 PN 6 .. 400 C, F, N, B.. ANSI 1/2" .. 20" 150 ... 2500lbs SF, RTJ, RF.. JIS B 2010 1/2" ... 20" 5K ... 63K A .. T BSI BS 4504 DN 15 ... 500 PN 6 ... 400 6/x ... 400/x S Special flange with outside diameter mm	
<b>Code 3</b>	<b>Key 1</b>	<b>Electrode material</b>	<b>ATEX</b>
	V - Ti - H - M - .. -	Stainless steel (also flexible) Titanium Alloy Brass Various	
<b>Code 4</b>	<b>Key 1</b>	<b>Length of rod in mm</b>	<b>ATEX</b>
	L1 .. - L1 .. - L2 .. - L1 .. - L2 .. - L3 .. - .. -	for 1 - rod electrode for 2 - rods electrode for 3 - rods electrode etc.	
<b>Code 5</b>	<b>Key 1</b>	<b>Cable / length of cable in m</b>	<b>ATEX</b>
	.. PVC - .. PVC-blau - .. Sil - .. PUR - .. FEP - .. Lit - .. NiLit - .. Radox - .. - Options .. / CY .. / ÖL	.. Polyvinylchloride PVC (PVC-grey) .. Polyvinylchloride PVC (PVC-blue) .. Silicone .. Pur .. Teflon .. Insulated stranded wire .. Insulated nickel stranded wire .. Radox .. Various Shielded cable Oil resisting cable	

### Type combination

Code	1	2	3	4	5
Key	1/2/3	1/1/1	1	1	1
Example	EPPF -	25/10/C	V -	L1 ... -	SIL