

JUMO tecLine CR

Stainless steel and titanium conductive conductivity sensors

Type series 202924 (previous type series 2 EL6...)

Typical areas of application

- Pure and highly-purified water
- Pharmaceutical industry
- Chemicals
- Food technology
- Chip manufacturing
- Ion exchangers
- Reverse osmosis plants

Features

- 2-electrodes principle
- For measuring ranges from 0.05 $\mu\text{S}/\text{cm}$ to 1 mS/cm
- Sturdy design type
- Wide variety of process connections
- Various insertion lengths
- Pharmaceutical version available
- Made up of physiologically safe, FDA-compliant materials

Brief description

JUMO conductivity sensors are used in conjunction with suitable transducers to define the electrolytic conductivity in liquids. The type series 202924 sensors work according to the 2-electrodes principle. The transducer supplies them with alternating voltage. The current that is carried through the liquid and the electrodes is defined by the medium's conductivity.

Special versions

Pharmaceutically-compliant conductivity sensors with a surface roughness $< 0.8 \mu\text{m}$ are supplied as "pharmaceutical packages" with certificates (ASTM test certificate, FDA approval for insulators and O-rings, inspection certificate 3.1). The sensors are packed air tight in foil.

A special conductivity sensor is available for **high temperature applications**. This sensor can be used for medium temperatures of up to 200 °C and a maximum pressure of 17 bar.

Furthermore, we also offer conductivity sensors as **thin versions** that have a shaft diameter of only 16 mm.



Type 202924/10... (Example)



Type 202924/20... (Example)



Type 202924/30... (Example)

Technical data

Type	202924/10...	202924/20...	202924/21...	202924/30...	202924/31...
Cell constants ^a	K = 0.01 cm ⁻¹ K = 0.1 cm ⁻¹				
Typical measuring ranges ^b	0.05 to 10 µS/cm (when K = 0.01) 1 µS to 1 mS/cm (when K = 0.1)				
Temperature compensation	With Pt100 or Pt1000, both at least class A				
Process connections	Thread G 1/2 A, Thread G 3/4 A, Thread G 1 A, Thread 1/2"-14 NPT, Thread 3/4"-14 NPT, Taper socket DN 25 (milk cone), Clamp DN 25	Thread G 1/2 A Clamp DN 25	Clamp DN 25	JUMO PEKA Adapter: Orbital welding socket DN 25-40, VARIVENT® DN 50-150	JUMO PEKA Adapter: Orbital welding socket DN 25-40, VARIVENT® DN 50-150, Clamp DN 25-50, Aseptic DN 40/50, Aseptic NKS DN 40
Body materials	PVDF (default), Stainless steel 1.4571 (optional extra), High temperature version: Stainless steel 1.4404 (optional extra)	Stainless steel 1.4435, similar to 316L, version for pharmaceutical industry			
Cell materials	Stainless steel 1.4571 (default), Titanium (optional extra) High temperature version: Stainless steel 1.4404 (default)	Stainless steel 1.4435, similar to 316L, version for pharmaceutical industry			
Operating temperature	Up to 135 °C; High temperature version: Up to 200 °C	Up to 135 °C		Up to 135 °C (standard operation); Up to 150 °C (sterilization, max. 45 min.)	
Maximum pressure	16 bar at 25 °C or 9 bar at 60 °C; High temperature version: 40 bar at 25 °C or 17 bar at 200 °C;	16 bar at 25 °C or 1 bar at 135 °C		9 bar at 25 °C or 5 bar at 150 °C, max. 45 min.	
Electrical connections	Right-angle connector (default) Fixed cable (optional extra) High temperature version: Right-angle connector	M12 connector (default) Fixed cable (optional extra) Right-angle connector (optional extra)	M12 connector		

Certificates

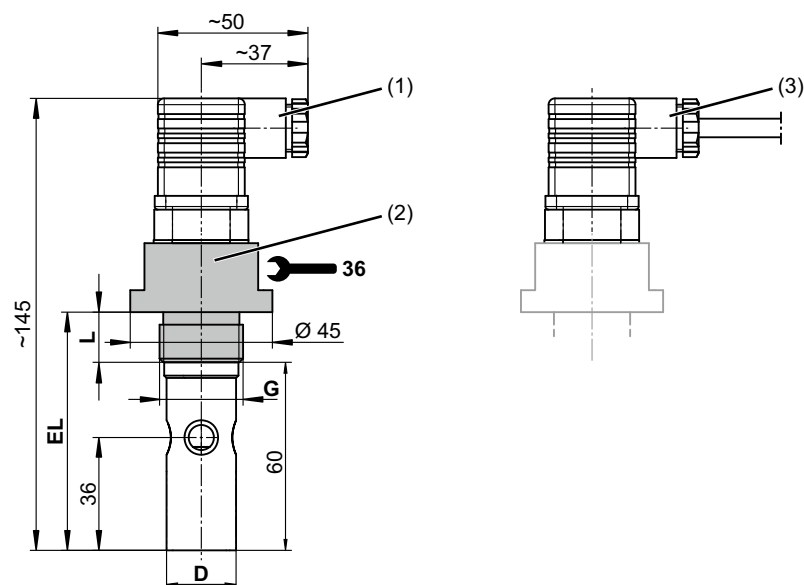
ASTM test certificate	Determination of the exactly measured cell constant according to ASTM D1125-95 and ASTM D5391-99 (one-point calibration)
FDA approval	The plastics used (insulators and O-rings) are FDA-listed
Optional certificates	Certificate of compliance according to EN 10204 2.1, EN 10204 2.2, EN 10204 3.1 (material, roughness)

^a The cell constant can differ by ±10 % of the nominal value depending on manufacturing. This deviation can be equalized on the transducer.

^b The measuring ranges depend on the transducer being used. When used in measuring ranges larger than the "typical" one, incorrect measured values may occur due to polarization.

Type 202924/10 dimensions...

Process connections -104, -105 und -106 (G thread)



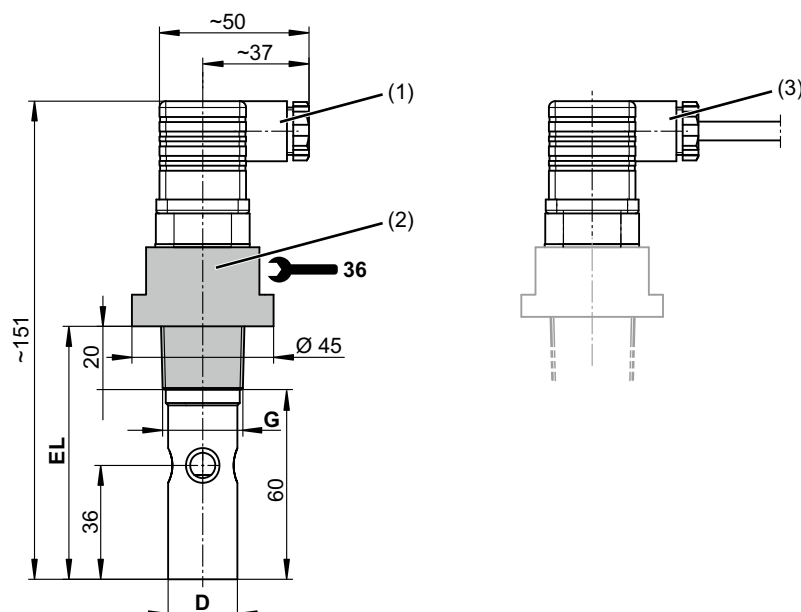
Thread		Shaft Ø	Insertion length
G	L	D	EL
G 1/2 A	14	16	74
G 3/4 A	16	22	76
G 1 A	18	22	78

(1) Right-angle connector (default)

(3) Fixed cable (optional extra)

(2) Process connection

Process connections -144 and -145 (NPT thread)



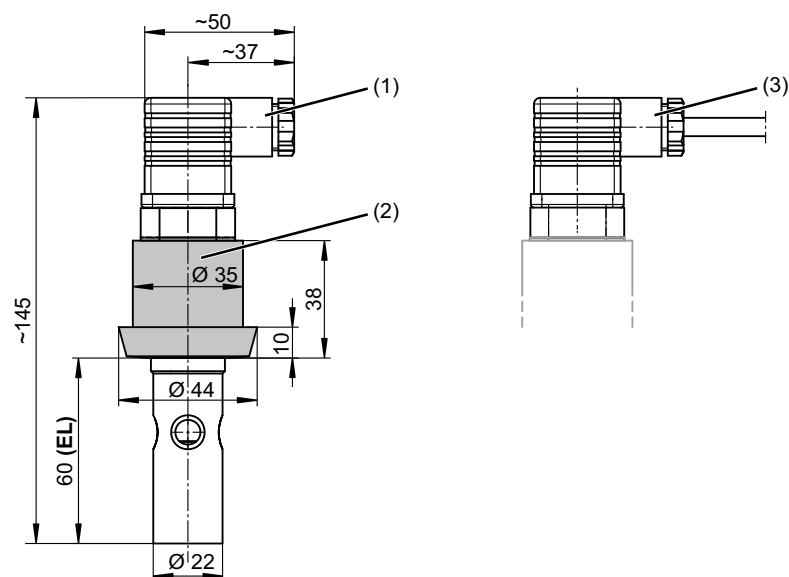
Thread	Shaft Ø	Insertion length
G	D	EL
1/2-14 NPT	16	80
3/4-14 NPT	22	80

(1) Right-angle connector (default)

(3) Fixed cable (optional extra)

(2) Process connection

Process connection -604 "milk cone" (taper socket DN 25 according to DIN 11851)

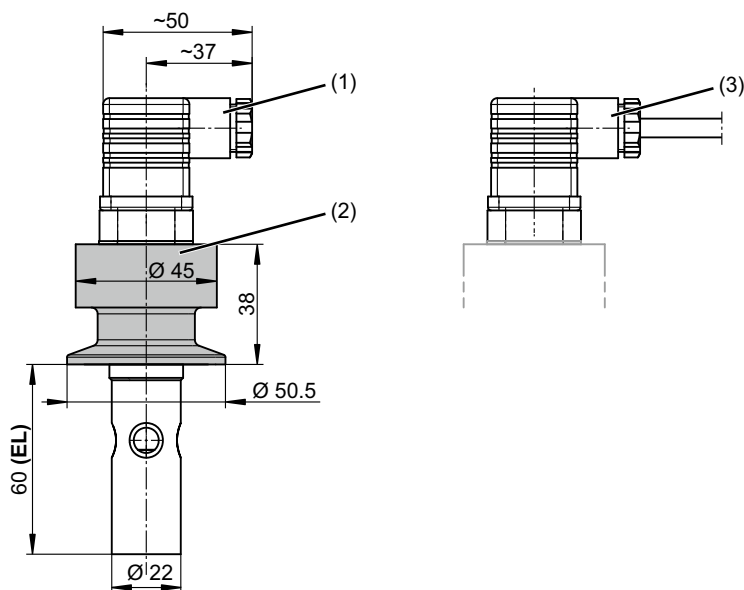


(1) Right-angle connector (default)

(3) Fixed cable (optional extra)

(2) Process connection

Process connection -613 (clamp DN 25)

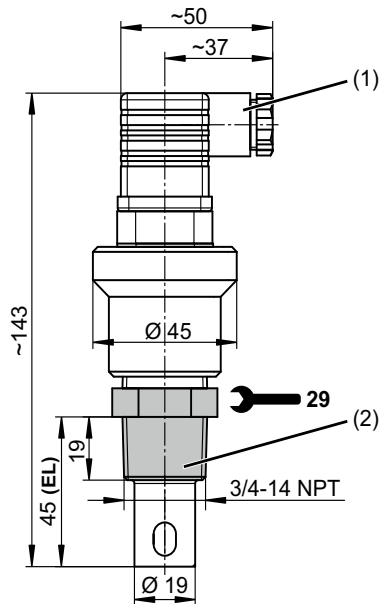


(1) Right-angle connector (default)

(3) Fixed cable (optional extra)

(2) Process connection

High temperature version (extra code -765)

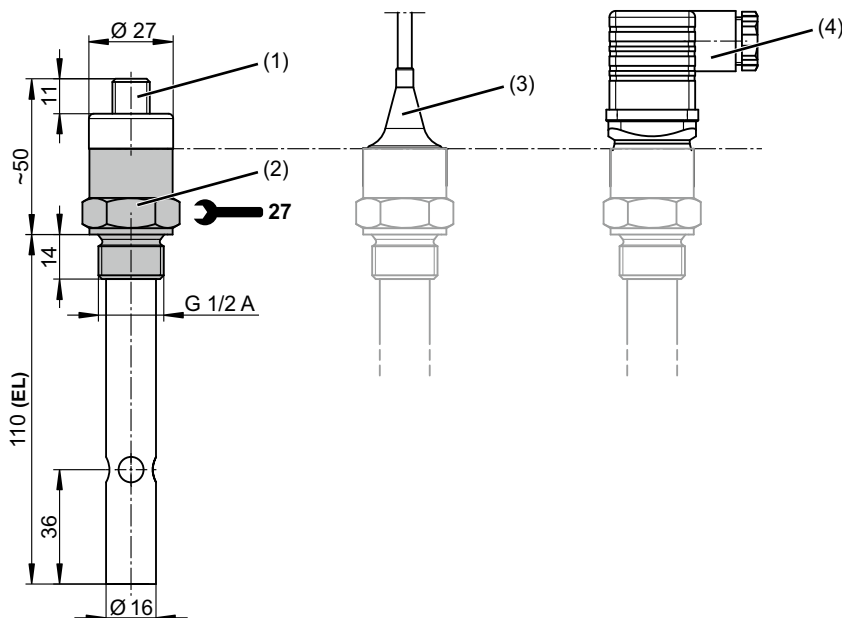


(1) Right-angle connector

(2) Process connection

Type 202924/20 dimensions...

Process connection -104 (thread G 1/2 A)



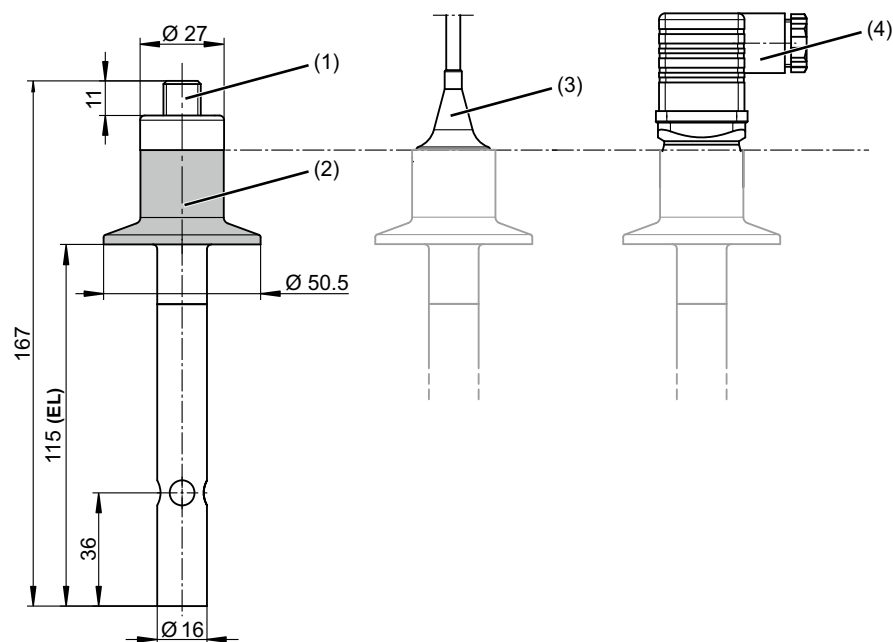
(1) M12 connector (default)

(2) Process connection

(3) Fixed cable (optional extra)

(4) Right-angle connector (optional extra)

Process connection -613 (clamp DN 25)



(1) M12 connector (default)

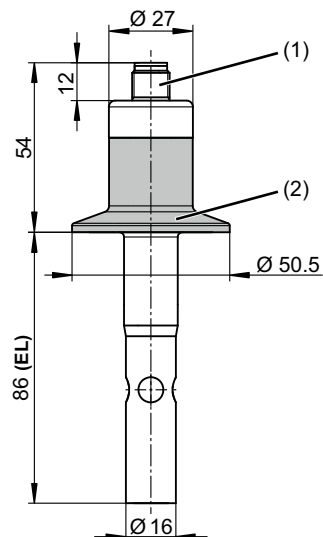
(2) Process connection

(3) Fixed cable (optional extra)

(4) Right-angle connector (optional extra)

Type 202924/21 dimensions...

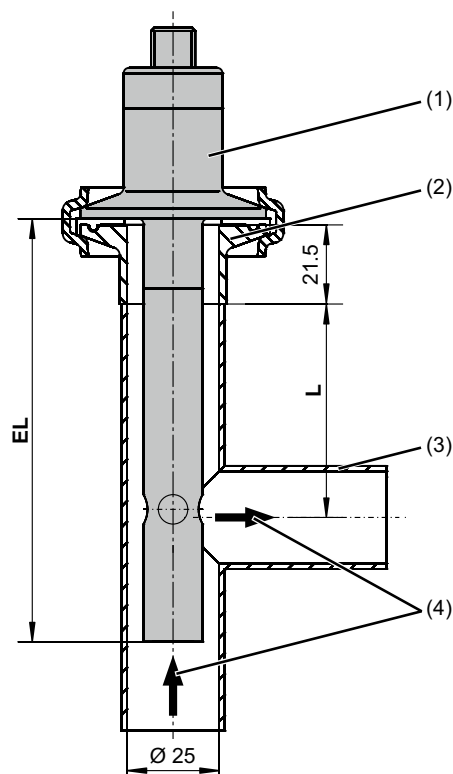
Process connection -613 (clamp DN 25)



(1) M12 connector

(2) Process connection

Type 202924/20... and /21... installation example



- (1) Sensor with process connection clamp DN 25
- (2) Clamp socket DIN DN 25, 1", ISO DN 20
- (3) T-piece (**not included in the scope of delivery!**)
- (4) Flow direction

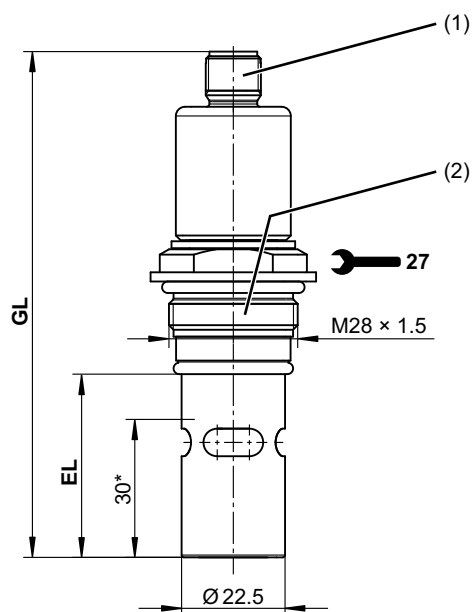
Recommended T-piece for installing the sensors

Sensor	T-piece	Length L
202924/20... EL = 115 mm	DIN 11852, DN 25	50 mm
202924/21... EL = 86 mm	Similar DIN 11852, DN 25	27 mm

Type 202924/30... and /31... dimensions

Process connection -997
(JUMO PEKA with EHEDG certificate)

Installation length EL	Total length GL	Sensor type
40	110	202924/30...
70	140	202924/31...



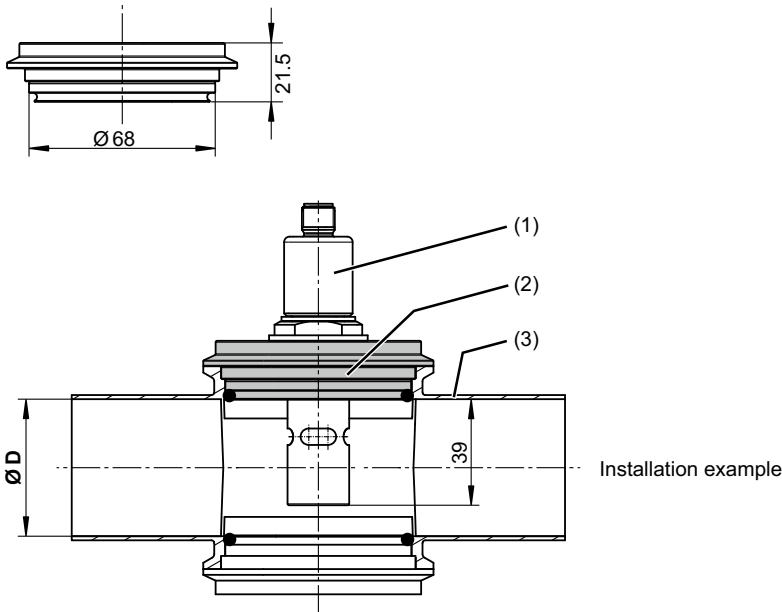
(1) M12 connector

* Minimum immersion depth

(2) Process connection 997 (PEKA),
Stainless steel 1.4435

Process connection adapter for type 202924/30... and /31...

Varivent DN 40 - 150
Part no.: 00577961



- (1) JUMO tecLine CR-PEKA sensor (3) VARIVENT® housing
(2) VARIVENT® DN 40 - 150 process adapter

VARIVENT® housing DN ^a	Ø D	Sensor type
40	40	--
50	50	202924/30
65	70	202924/30
80	81	202924/30 ^b 202924/31
100	100	202924/30 ^b 202924/31
125	125	202924/30 ^b 202924/31
150	150	202924/30 ^b 202924/31

^a To be provided by the customer.

^b Preferred sensor type.

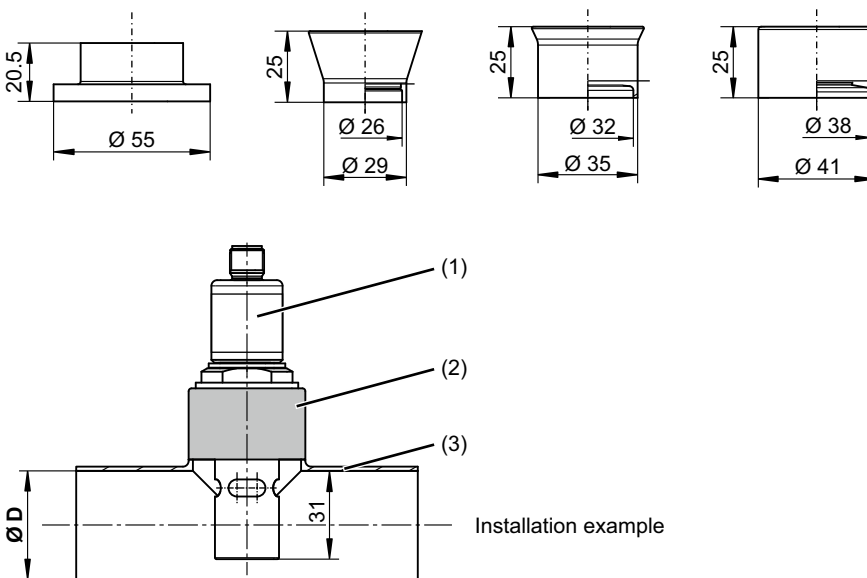
O-ring not included in the scope of delivery!

Welding socket
Ø 55
Part no.: 00447190

Orbital welding socket DN 25
Part no.: 00530211

Orbital welding socket DN 32
Part no.: 00530212

Orbital welding socket DN 40
Part no.: 00531973



- (1) JUMO tecLine CR-PEKA sensor (3) Short T-piece, similar to DIN 11852
(2) Welding socket

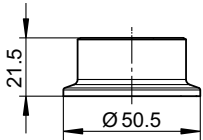
Orbital welding socket DN	T-piece DN ^a	Ø D	Sensor type
25/32/40	40-25/32/40	38	202924/30
	50-25/32/40	50	
	65-25/32/40	70	
	80-25/32/40	81	202924/30 ^b 202924/31
	100-25/32/40	100	202924/30 ^b 202924/31
	125-25/32/40	125	202924/30 ^b 202924/31
	150-25/32/40	150	202924/30 ^b 202924/31

^a To be provided by the customer.

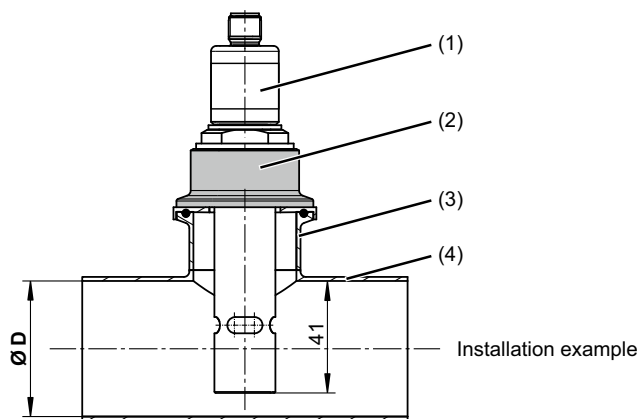
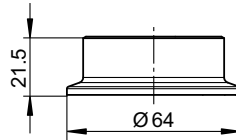
^b Preferred sensor type.

Process connection adapter for type 202924/31...

Clamp DN 25/32/40
Part no.: 00577998



Clamp DN 50
Part no.: 00577997



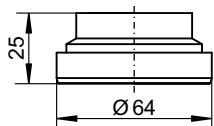
- (1) JUMO tecLine CR-PEKA sensor
- (2) Clamp process adapter
- (3) Clamp socket DIN 32676
- (4) Short T-piece, similar to DIN 11852

Clamp socket DN ^a	T-piece DN ^a	Ø D
25/32/40	50 - 25/32/40	50
	65 - 25/32/40	70
	80 - 25/32/40	81
	100 - 25/32/40	100
	125 - 25/32/40	125
	150 - 25/32/40	150
50	50 - 50	50
	65 - 50	70
	80 - 50	81
	100 - 50	100
	125 - 50	125
	150 - 50	150

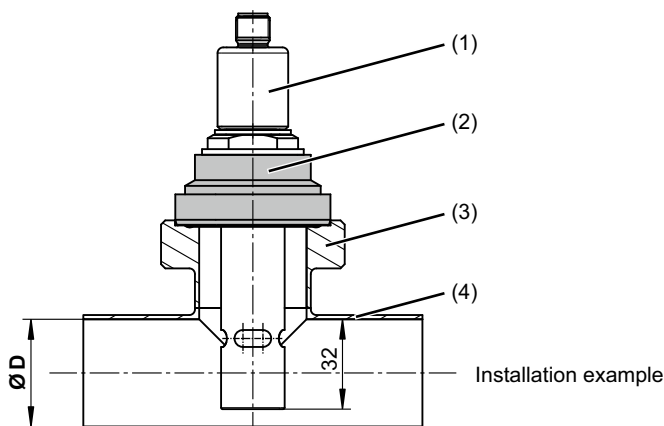
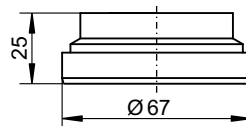
^a To be provided by the customer.

O-ring not included in the scope of delivery!

Aseptik DN 40
Part no.: 00577995



Aseptik DN 50
Part no.: 00577979



- (1) JUMO tecLine CR-PEKA sensor
- (2) Aseptic process adapter
- (3) Threaded connection DIN 11864-1
- (4) Short T-piece, similar to DIN 11852

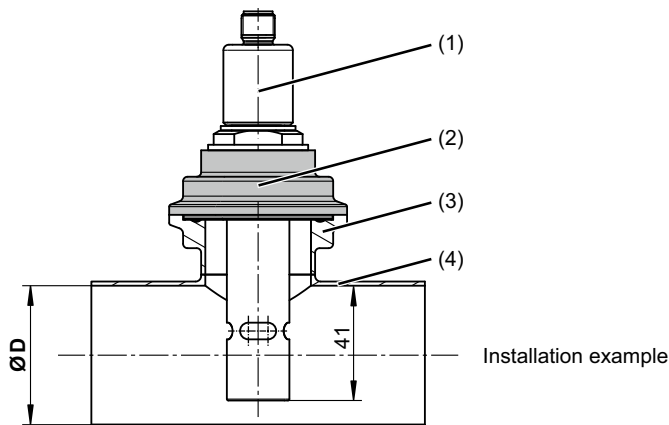
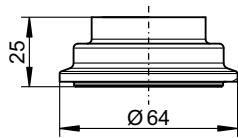
Threaded connection DN ^a	T-piece DN ^a	Ø D
40	40 - 40	38
	50 - 40	50
	65 - 40	70
	80 - 40	81
	100 - 40	100
	125 - 40	125
	150 - 40	150
50	50 - 50	50
	65 - 50	70
	80 - 50	81
	100 - 50	100
	125 - 50	125
	150 - 50	150

^a To be provided by the customer.

O-ring not included in the scope of delivery!

Aseptik NKS DN 40

Part no.: 00577999



Collar clamp socket ^a	T-piece DN ^a	Ø D
NKS DN 40 form A	50 - 40	50
	65 - 40	70
	80 - 40	81
	100 - 40	100
	125 - 40	125
	150 - 40	150

^a To be provided by the customer.

O-ring not included in the scope of delivery!

- | | |
|---------------------------------------|---|
| (1) JUMO tecLine CR-PEKA sensor | (3) Collar clamp socket DIN 11864-3 |
| (2) Aseptic process adapter NKS DN 40 | (4) Short T-piece, similar to DIN 11852 |

Electrical connection

Connection for	right-angle connector	M12 connector	Fixed cable
Outer electrode		1	White
Inner electrode	2	2	Brown
Temperature compensation (optional extra)	1 3	3 4	Yellow Green
3-wire circuit		5	

Order details

(1) Basic type					
202924 Conductivity sensors					
(2) Basic type extension					
10 JUMO tecLine CR-VA (Ø 22 mm and others)					
20 JUMO tecLine CR-VA SL (Ø 16 mm, insertion length 115 mm)					
21 JUMO tecLine CR-VA SL-S (Ø 16 mm, insertion length 86 mm)					
30 JUMO tecLine CR-PEKA S (Ø 22.5 mm, insertion length 40 mm)					
31 JUMO tecLine CR-PEKA L (Ø 22.5 mm, insertion length 70 mm)					
(3) Cell constant					
X	X	X	X	X	0001 K = 0.01 (measuring range 0.1 to 20 MΩcm or 0.05 to 10 µS/cm) ^a
X	X	X	X	X	0010 K = 0.1 (measuring range 1 µS to 1 mS/cm) ^a
(4) Measuring insert					
X	X	X			0000 None
X	X	X			1003 Pt100
X	X	X	X	X	1005 Pt1000
(5) Process connection					
X	X				104 Thread G 1/2 A
X					105 Thread G 3/4 A
X					106 Thread G 1 A
X					144 Thread 1/2"-14 NPT
X					145 Thread 3/4"-14 NPT
X					604 Taper socket DIN 11851 DN 25 (milk cone)
X	X	X			613 Clamp DN 25
			X	X	997 JUMO PEKA ^b With EHEDG certification
(6) Electrical connection					
X	X				17 Permanent cable connection, line length 5 m
X	X				37 Right-angle connector according to DIN 43650
	X	X	X	X	83 M12 connector
(7) Process connection material					
X					24 Stainless steel 1.4404 (only in HT version (extra code 765))
X					26 Stainless steel 1.4571
X	X	X	X	X	31 Stainless steel 1.4435 (similar to 316L, version for pharmaceutical industry)
X					88 PVDF (default)
(8) Electrode material					
X	X	X			24 Stainless steel 1.4404 (only in HT version (extra code 765))
X					26 Stainless steel 1.4571
X	X	X	X	X	31 Stainless steel 1.4435 (similar to 316L, version for pharmaceutical industry)
X	X				60 Titanium ^c
(9) Extra code					
X	X	X	X	X	000 None
X					765 High temperature (HT) version ^d (Cell constant K = 0.1)

^a The measuring ranges depend on the transducer being used. When used in measuring ranges larger than the "typical" one, incorrect measured values may occur due to polarization.

^b Please order PEKA adapters separately, see accessories.

^c Only available in connection with process connection material 88 (PVDF).

^d Only available with process connection 145 (thread 3/4"-14 NPT).

Order code (1) (2) (3) (4) (5) (6) (7) (8) (9)
 Order example 202924 / 10 - 0010 - 1003 - 105 - 37 - 88 - 26 / 000

Important information:

The order code is not modular. When placing orders, if possible please select the items listed under "Stock versions" or "Production versions". We must check the technical feasibility of and approve freely chosen combinations of individual code parts.

Stock versions

Standard

Delivery within 3 working days after receipt of order

Order code	Brief description	Part no.
202924/10-0010-0000-105-37-88-26/000	K = 0.1/G 3/4A	00300203
202924/10-0010-1003-105-37-88-26/000	K = 0.1/Pt100/G 3/4A	00300202
202924/10-0010-1003-104-37-88-26/000	K = 0.1/Pt100/G 1/2A	00338487
202924/10-0001-0000-105-37-88-26/000	K = 0.01/G 3/4A	00300204
202924/10-0001-1003-105-37-88-26/000	K = 0.01/Pt100/G 3/4A	00300079
202924/10-0001-1003-106-37-88-26/000	K = 0.01/Pt100/G 1A	00089393
202924/20-0010-1003-104-83-31-31/000	K = 0.1/Pt100/G 1/2A/Ø 16 mm	00456809
202924/20-0001-1003-104-83-31-31/000	K = 0.01/Pt100/G 1/2A/Ø 16 mm	00452527

Pharmaceutical packages with certificates

Order code	Cell constant	Measuring insert	Brief description	Part no.
202924/10-0001-1003-613-37-31-31/000	K = 0.01	Pt100 class A	Clamp DN 25 and object in stainless steel 1.4435, packed air tight in foil, incl. ASTM test certificate, FDA approval for insulators and O-rings, inspection certificate 3.1, R _a < 0.8 μm	00420617
202924/10-0010-1003-613-37-31-31/000	K = 0.1			00405886
202924/20-0001-1003-613-83-31-31/000	K = 0.01			00456810
202924/20-0010-1003-613-83-31-31/000	K = 0.1			00456812
202924/21-0001-1005-613-83-31-31/000	K = 0.01	Pt1000 class A		00620488
202924/21-0010-1005-613-83-31-31/000	K = 0.1			00620490
202924/30-0001-1005-997-83-31-31/000 ^a	K = 0.01			00562982
202924/30-0010-1005-997-83-31-31/000 ^a	K = 0.1			00562983
202924/31-0001-1005-997-83-31-31/000 ^a	K = 0.01			00562984
202924/31-0010-1005-997-83-31-31/000 ^a	K = 0.1			00562986

^a Please order PEKA adapters separately, see accessories.

Manufacturing versions

Standard

Delivery within 10 working days after receipt of order

Order code	Brief description	Part no.
202924/10-0001-0000-105-37-26-26/000	K = 0.01/G 3/4 A/process connection 1.4571	00353041
202924/10-0001-1003-604-37-88-26/000	K = 0.01/Pt100/milk cone	00089395
202924/10-0010-1003-106-37-88-26/000	K = 0.1/Pt100/G 1A	00089389
202924/10-0010-0000-105-37-26-26/000	K = 0.1/G 3/4 A/process connection 1.4571	00350627
202924/10-0010-1003-613-37-26-26/000	K = 0.1/Pt100/clamp DN 25/process connection 1.4571	00322533

High temperature version

Order code	Brief description	Part no.
202924/10-0010-1003-145-37-24-24/765	K = 0.1/Pt100/NPT3/4-14	00397615

Versions prepared for certificates

Order code	Brief description	Part no.
202924/10-0001-1003-105-37-88-26/000	K = 0.01/Pt100/G 3/4 A Version able to receive certificate – certificates must be ordered separately	00392030
202924/10-0010-1003-105-37-88-26/000	K = 0.1/Pt100/G 3/4 A Version able to receive certificate – certificates must be ordered separately	00392031

Optional certificates

Item	Part no.
Inspection certificate according to EN 10204 3.1 (please clearly specify when ordering: "material" and/or "roughness")	00365727
ASTM test certificate for exactly measured cell constant (one-point calibration)	00359893
FDA approval for insulators and O-rings	00423913

Accessories

Cable

Item	Part no.
Connecting cable, length 25 m, assembly by user, 4-pin + screen	00303681
Connecting cable, length 50 m, assembly by user, 4-pin + screen	00304181
Connecting cable including M12 cable socket (straight), length 10 m, 4-pin + screen	00458513
Connecting cable including M12 cable socket (straight), length 25 m, 4-pin + screen	00458514
Cable box M12 × 1, 4-pin, 713 series, angled form (cable not included in scope of delivery), gold-plated contacts	00318906

JUMO PEKA process connection adapter

Item	Part no.
... for VARIVENT® DN 40 - 125, stainless steel 1.4435/316 L ^a	00577961
... for clamp DN 25/32/40, stainless steel 1.4435/316 L ^a	00577998
... for clamp DN 50, stainless steel 1.4435/316 L ^a	00577997
... for aseptic DN 40, stainless steel 1.4435/316 L ^a	00577995
... for aseptic DN 50, stainless steel 1.4435/316 L ^a	00577979
... for aseptic NKS DN 40, stainless steel 1.4435/316 L ^a	00577999
Welding socket M 28, Ø 55 mm, stainless steel 1.4435/316L	00447190
Orbital welding socket DN 25, stainless steel 1.4435/316L	00530211
Orbital welding socket DN 32, stainless steel 1.4435/316L	00530212
Orbital welding socket DN 40, stainless steel 1.4435/316L	00531973

^a Including inspection certificate 3.1, R_a < 0.8 µm