

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 con- nector (optional extra)	M12 connector		

Certificates

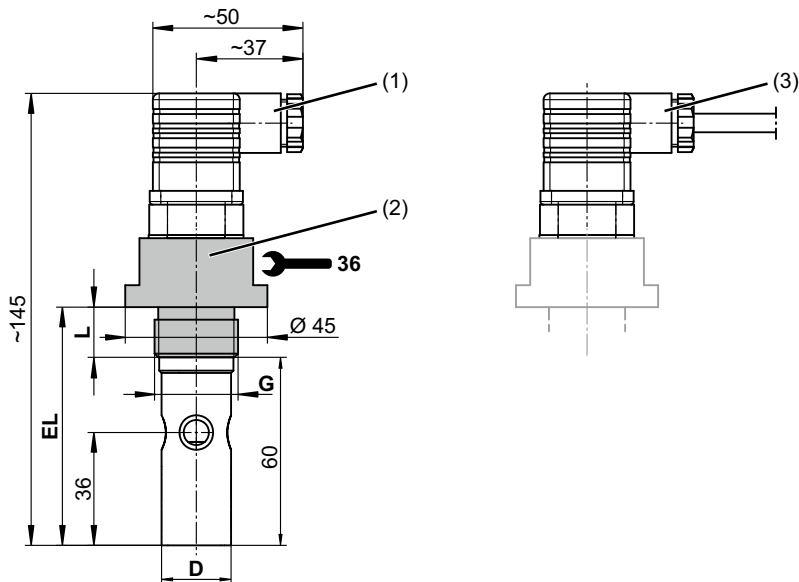
ASTM test certificate	Determination of the exactly measured cell constant according to ASTM D1125-95 and ASTM D5391-99 (one-point calibration)
FDA approval	The plastics used (insulators and O-rings) are FDA-listed
Optional certificates	Certificate of compliance according to EN 10204 2.1, EN 10204 2.2,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

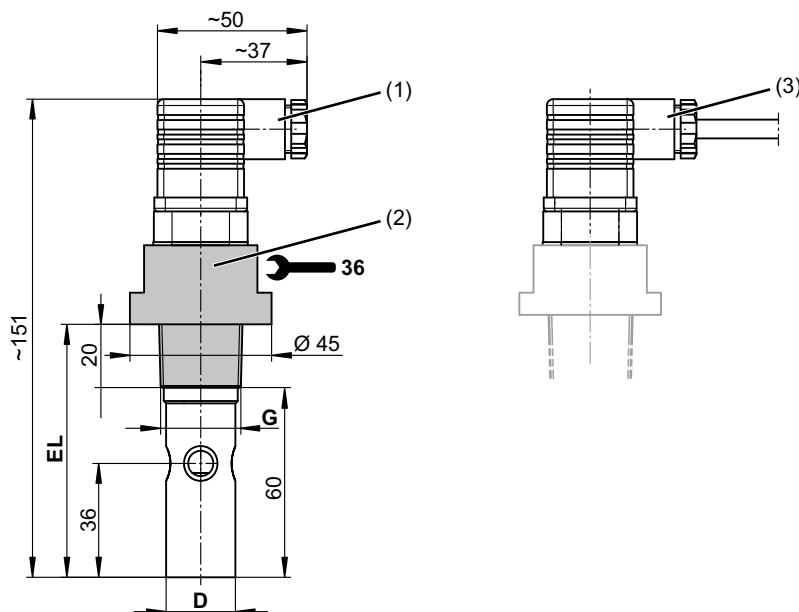
Process connections -104, -105 und -106 (G thread)



Thread	Shaft Ø		Insertion length
	L	D	
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

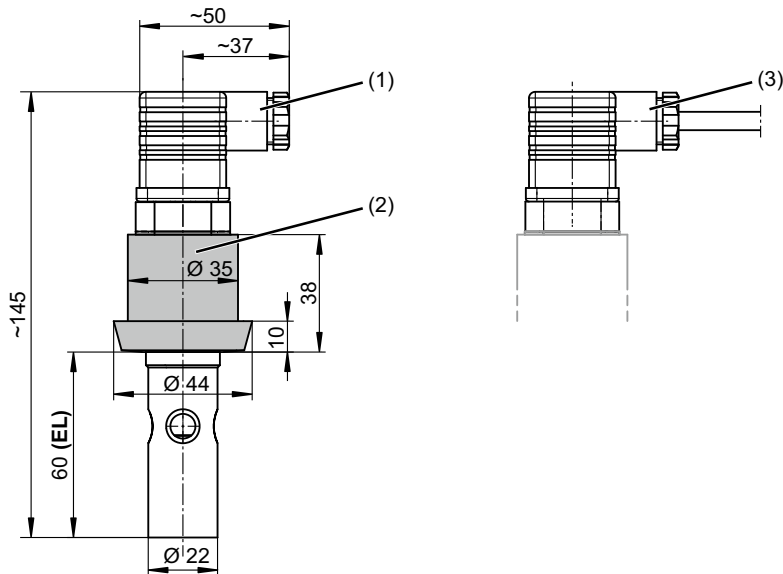
Process connections -144 and -145 (NPT thread)



Thread	Shaft Ø		Insertion length
	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

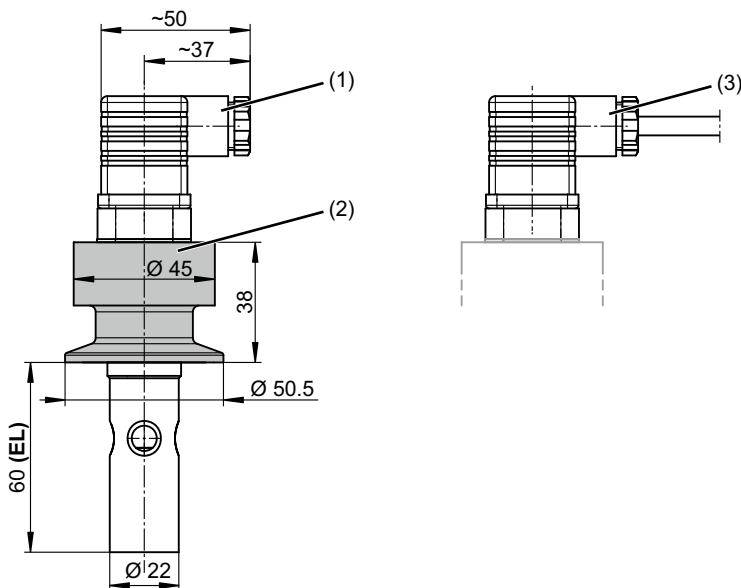
Process connection -604 "milk cone" (taper socket DN 25 according to DIN 11851)



- (1) Right-angle connector (default)
 (2) Process connection

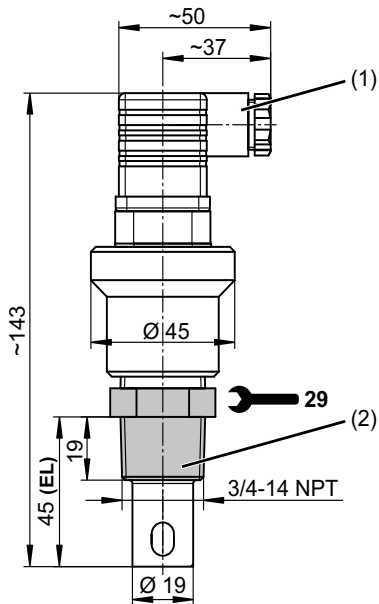
- (3) Fixed cable (optional extra)

Process connection -613 (clamp DN 25)



- (1) Right-angle connector (default)
 (2) Process connection

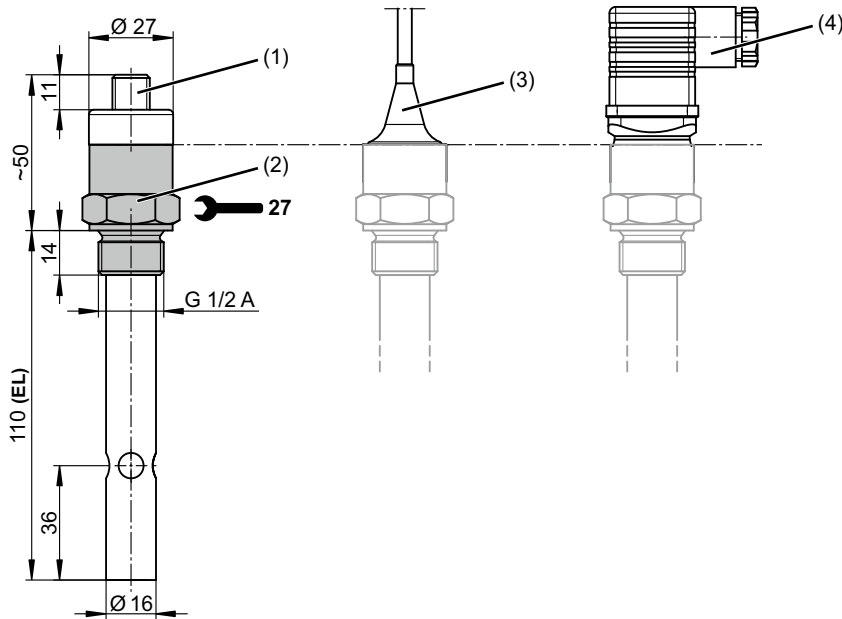
- (3) Fixed cable (optional extra)

High temperature version (extra code -765)

- (1) Right-angle connector
- (2) Process connection

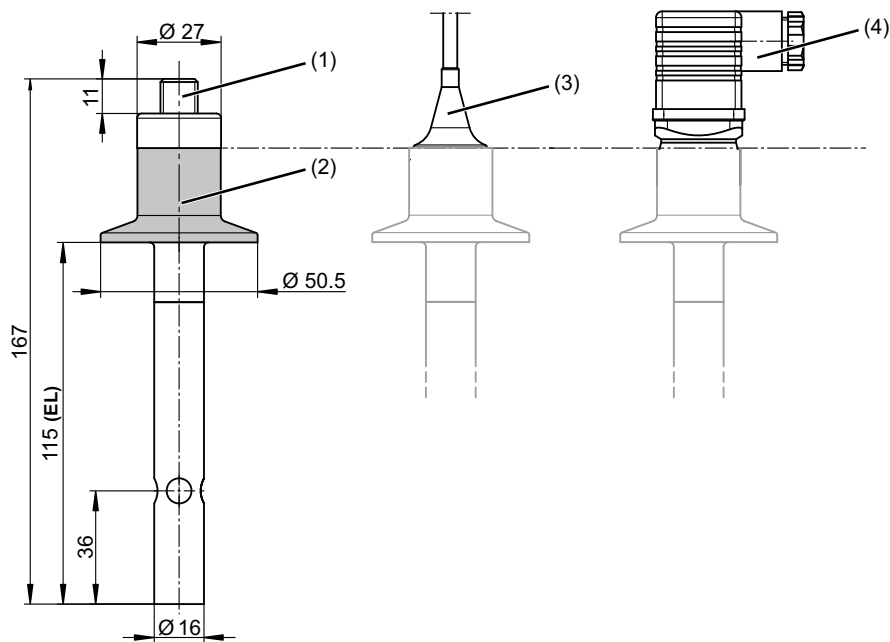
Type 202924/20 dimensions...

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



- | | |
|-----------------------------|--|
| (1) M12 connector (default) | (3) Fixed cable (optional extra) |
| (2) Process connection | (4) Right-angle connector (optional extra) |

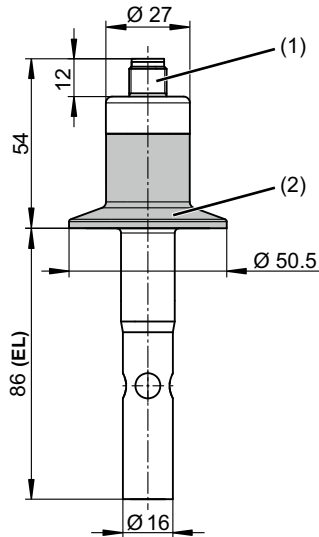
Process connection -613 (clamp DN 25)



- | | |
|-----------------------------|--|
| (1) M12 connector (default) | (3) Fixed cable (optional extra) |
| (2) Process connection | (4) Right-angle connector (optional extra) |

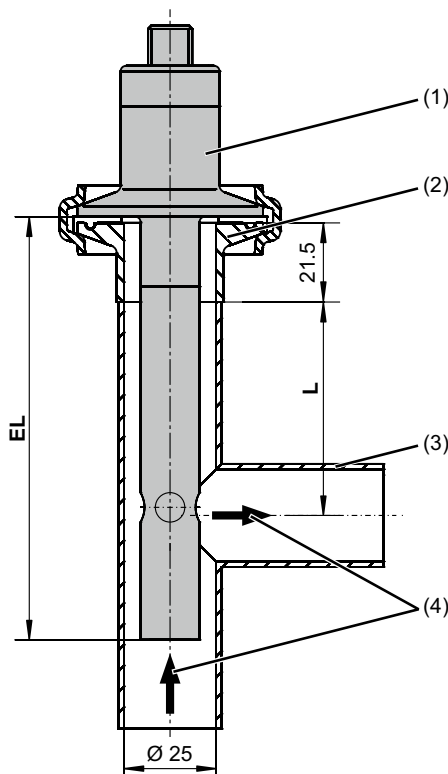
Type 202924/21 dimensions...

Process connection -613 (clamp DN 25)



- (1) M12 connector
- (2) Process connection

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



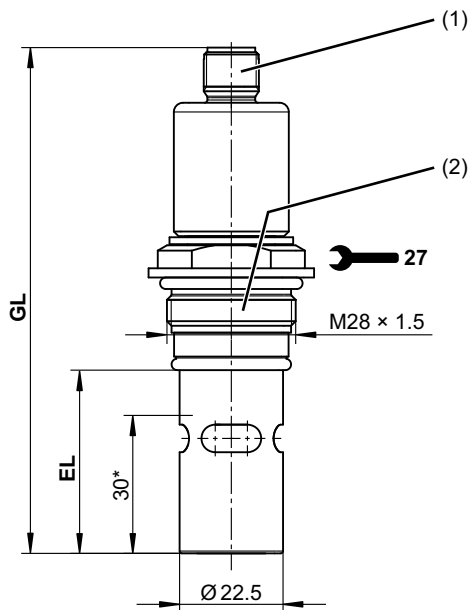
- (1) Sensor with process connection clamp DN 25
- (2) Clamp socket DIN DN 25, 1", ISO DN 20
- (3) T-piece (**not included in the scope of delivery!**)
- (4) Flow direction

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...

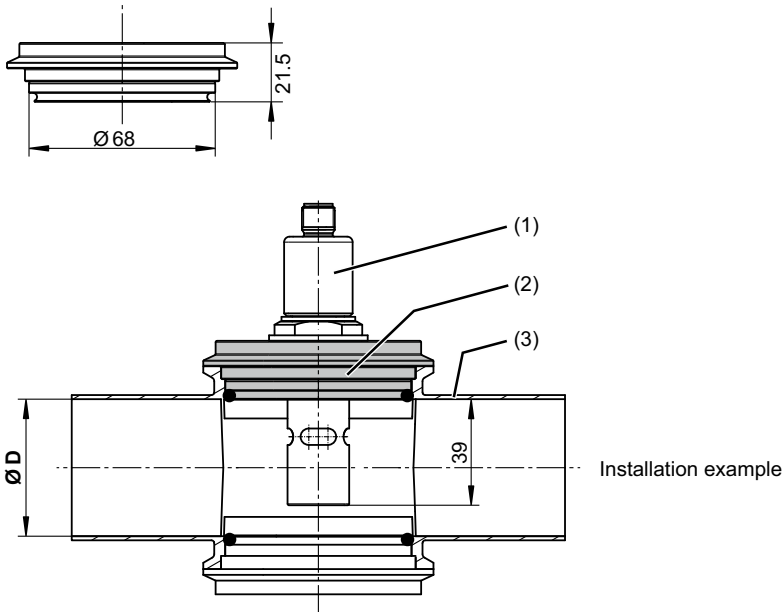
- (1) M12 connector
(2) Process connection 997 (PEKA),
Stainless steel 1.4435

* Minimum immersion depth

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

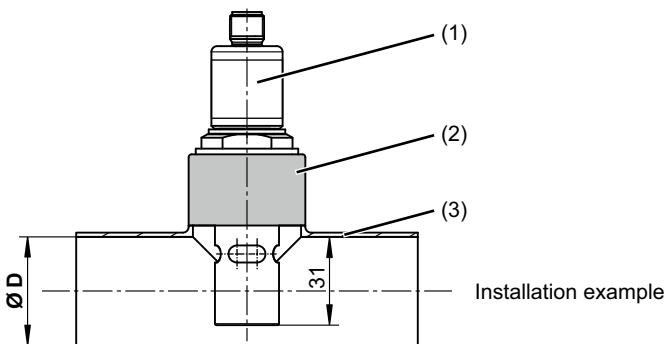
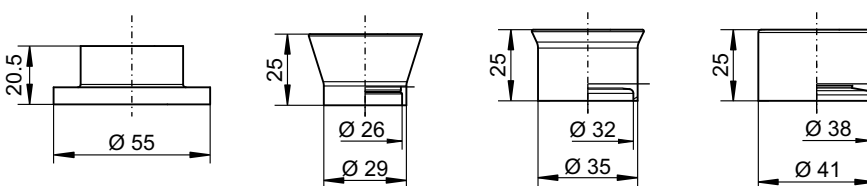
Part no.: 00530211

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

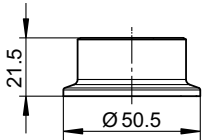
Orbital welding socket DN	T-piece DN ^a	Ø D	Sensor type ^e
25/32/40	40-25/32/40	38	202924/30
	50-25/32/40	50	
	65-25/32/40	70	
	80-25/32/40	81	202924/30 ^b 202924/31
	100-25/32/40	100	202924/30 ^b 202924/31
	125-25/32/40	125	202924/30 ^b 202924/31
150-25/32/40	150	202924/30 ^b 202924/31	

^a To be provided by the customer.

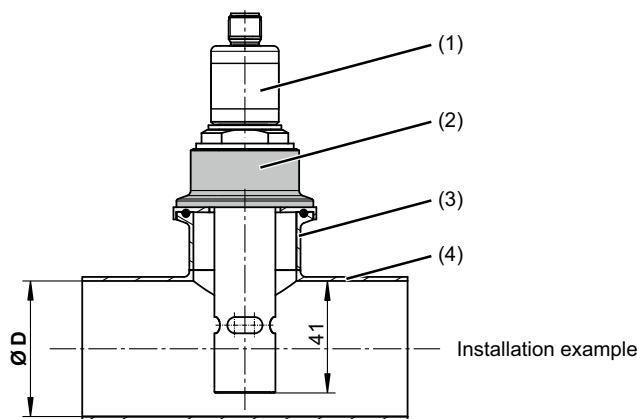
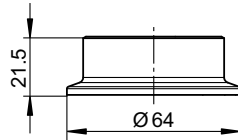
^b Preferred sensor type.

Process connection adapter for type 202924/31...

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



Clamp DN 50
Part no.: 00577997



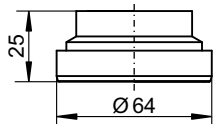
- (1) JUMO tecLine CR-PEKA sensor
- (2) Clamp process adapter
- (3) Clamp socket DIN 32676
- (4) Short T-piece, similar to DIN 11852

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

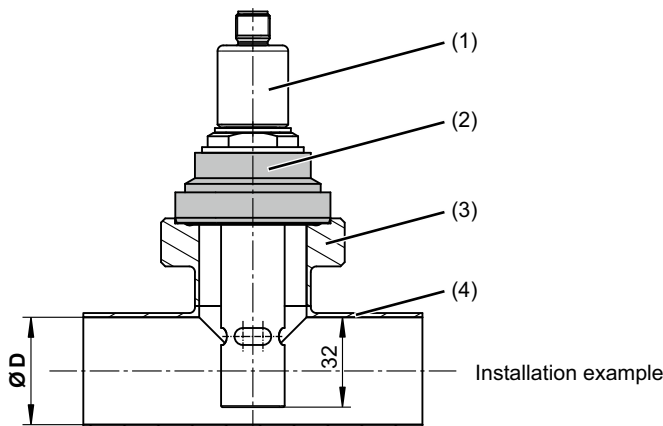
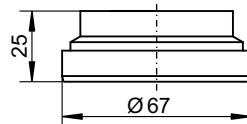
^a To be provided by the customer.

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

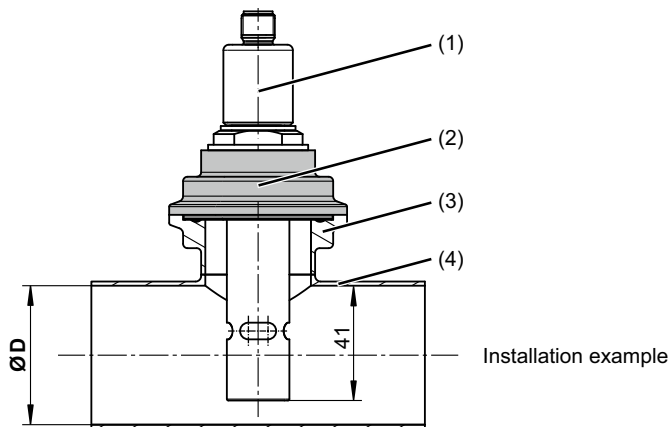
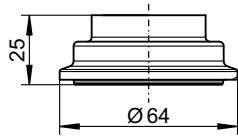
Threaded connection DN ^a	T-piece DN ^a	Ø D
40	40 - 40	38
	50 - 40	50
	65 - 40	70
	80 - 40	81
	100 - 40	100
	125 - 40	125
	150 - 40	150
50	50 - 50	50
	65 - 50	70
	80 - 50	81
	100 - 50	100
	125 - 50	125
	150 - 50	150

^a To be provided by the customer.

O-ring not included in the scope of delivery!

Aseptik NKS DN 40

Part no.: 00577999




- | | |
|---------------------------------------|---|
| (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 |

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!

Electrical connection

Connection for	right-angle connector	M12 connector	Fixed cable
Outer electrode		1	White
Inner electrode	2	2	Brown
Temperature compensation (optional extra)	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, $R_a < 0.8 \mu\text{m}$	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