

User's Manual

Model PF20, PS20 and PD20 Compact pH probe



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1. Preface

1.1 Introduction EXA Compact probe

EXA Compact is a versatile series of probes suitable for pH measurements in all common applications in industrial processes and (waste) water treatment installations.

EXA Compact is available as a flow type, an insertion type and an immersion type of fitting. A wide choice of process connections is available to make installation in a tank, open basin or pipe/bypass very simple. The careful choice of chemically resistant materials makes it suitable for most processes.

The EXA Compact probe is flexible in use and its small size and light weight makes it easy to handle.

EXA Compact comes as a complete system including a basic holder with temperature sensor, a spray unit for chemical cleaning and one combination cable.

The EXA Compact System is perfectly suited for the advanced capabilities of the FLXA402 analyser, e.g.: sensor diagnostics and automatic chemical cleaning, resulting in a reliable pH-loop with outstanding performance.

1.2. Features

- Available for flow, insertion and immersion mounting
- Integrated liquid earth suited for sensor diagnostics with the FLXA402 series analyzer.
- Suitable for measurement with double sided high impedance input circuits.
- Integrated spray unit for chemical cleaning.
- Integrated temperature sensor (Pt100 or Pt1000) supporting automatic temperature compensation.
- Electrode removal without twisting the cable.
- One combination cable incorporating all leads and shields.
- Easy installation by modular design and many process connections.
- All-in-one system eases stock and order processing.
- Non-flow combination electrode with PTFE-diaphragm.
- Wetted parts from PPS and stainless steel (or hastelloy) for excellent chemical resistance.

- Flow electrode for severe fouling and poisoning applications

1.3. Unpacking and inspection

The EXA Compact probe is supplied in separate parts, packed in a box. When ordered, an optional electrode will be also enclosed in its own electrode box. The 1 m or 2 m insertion tube of an EXA Compact Immersion probe will be supplied separately.

Open the box and check that the model code is the same as on the packing list (see chapter 2.4, 3.4 and 4.4 for the model code). Also check that it is supplied with the options you ordered. These options are delivered in separate bags.

If you have any problems or questions, please contact the nearest Yokogawa service center or sales organisation for assistance.

1.4. Warranty and Service

Yokogawa products are guaranteed free from defects in workmanship and materials under normal use and service for a period of (typically) 12 months from the date of shipment from the manufacturer. Individual Sales organizations can deviate from the typical warranty period, and the conditions of sale relating to the original purchase order should be consulted.

Damage caused by wear and tear, inadequate maintenance, corrosion, or by the effects of chemical processes is excluded from this warranty coverage. In the event of a warranty claim, the defective goods should be sent (freight paid) to the Service Department of the relevant Yokogawa Sales office for repair or replacement (at Yokogawa's discretion).

The following information must be included in the letter accompanying the returned goods:

- Model Code and Serial Number.
- Original Purchase Order and Date.
- Length of time in service and description of the process.
- Description of the fault and circumstances of the failure.
- Process/environmental conditions that may be related to the failure of the

- sensor.
- Statement as to whether warranty or nonwarranty service is requested.
- Complete shipping and billing instructions for return of material, plus the name and phone number of a contact person that can be reached for further information.
- Clean Statement

Returned goods that have been in contact with process fluids must be decontaminated and disinfected prior to shipment. Goods should carry a certificate to this effect, for the health and safety of our employees.

1.5. Serial number

The Serial number is defined by nine (9) alphanumeric characters:

$X_1 X_2$ Production location
 $X_3 X_4$ Year/Month code
 $X_5 X_6 X_7 X_8 X_9$ Tracking number

Example: N3P600028

Table 1: Production Year code

Year	Year code	Year	Year code
2014	P	2026	3
2015	R	2027	4
2016	S	2028	5
2017	T	2029	6
2018	U	2030	7
2019	V	2031	8
2020	W	2032	9
2021	X	2033	A
2022	Y	2034	B
2023	Z	2035	C
2024	1	2036	D
2025	2	2037	E

Material Safety Data sheets must be included for all components of the process to which the sensor(options) have been exposed.

Table 2: Production Month code

Month	Month code
January	1
February	2
March	3
April	4
May	5
June	6
July	7
August	8
September	9
October	A
November	B
December	C

2. EXA Compact probe Model PF20

2.1. General specifications PF20

2.1.1. Materials

Wetted parts

Holder:	Glass-filled PPS
Earth pin:	Stainless steel 316L or Hastelloy 276C
O-ring:	Viton/NBR
Spray unit:	Stainless steel 316L or Hastelloy 276C
Flow vessel:	Glass-filled PPS
Flanges:	Reinforced polyester
Flange adapters:	Glass-filled PPS (optional)

Non-wetted parts

Cap:	EPDM rubber
Protection hood:	Polypropylene

2.1.2. Operating range

Temperature:	0-70°C
Pressure: limits:	0-2 bar (0-200 kPa)
Flow rate:	max. 3 L/min.
Electrodes:	SC21C-AGP64 SC21C-AGP26 SC21C-AGC55 SC29C-PTC55 SC29C-PTP29 12 mm sensors with PG13.5 connector

2.1.3 Shipping details

Package size (LxWxH)	: 325 x 240 x 250 mm (Without options)
Package weight (max)	: ±1 kg (Option specific)

2.1.4 Process connections

DN50-PN10 or ½" 150Lbs ANSI flanges in reinforced polyester

2.2. Installation and mounting of PF20 probe

2.2.1. Selection of installation site

- Install the probe in a place where it can be maintained easily and safely.
Attention: for maintenance or replacing the electrode a space of ± 0.3 m above the top of the probe is required)
- Mount the Compact Flow Probe in a vertical position.
- The Flow Probe is ideal for installation in a bypass (circulation) line or sample loop from a large volume flow line. Preferably the Flow Probe should be mounted between 2 isolation valves and in a position as indicated in figure 1. Mounted in this way maintenance is easy and in flow conditions the tip of the electrode will always stay wetted.

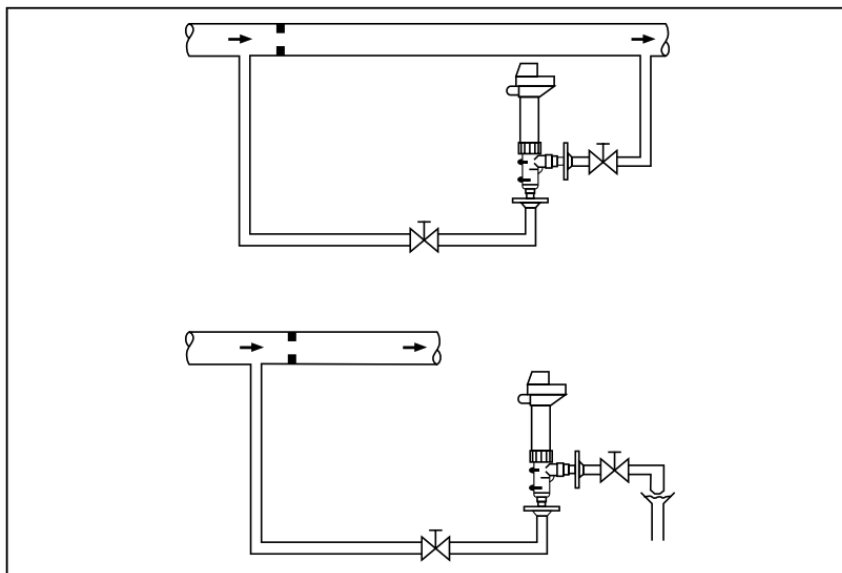


Figure 1: On-line measurement examples

2.2.2. Mounting PF20 probe

(see figure 2 and table 3)

1. Push the rubber cap (1) on to the protection hood (2)
2. Mount the flow vessel (4) in the process, preferably as shown in figure 16. An optional wall mounting plate (13) with 3 bolts (14) and/or flanges with adapters (15) can also be used as shown in figure 2.
Attention: the screw thread of the flange adapters has to be taped before screwing into the flow vessel.
3. Open the rubber cap and guide the combination cable (5) through the protection hood.
4. Screw the electrode (6) with "O"-ring (7) into the basic holder (3).
5.
 - a. Connect the combination cable (5) onto the electrode and liquid earth connector of the basic holder (see figure 2).
 - b. Connect the clip of the chain at the hole of the basic holder.
 This has a cable release function.
6. When using an EXA Compact Probe with chemical cleaning or with a flow electrode: see 6.2 and 6.3 respectively.
7. Push the protection hood onto the rubber clamping ring to fix it at the basic holder.
8. Pull at the cable and clamp it into the middle 'hole' (cut out) of the rubber cap (see figure 12). Close the rubber cap.
9.
 - a. **Attention:** check if the "O"-ring (11) is still in place in the basic holder.
 - b. Fix the basic holder at the flow vessel by screwing the fixing nut (10) **handtight** on the flow vessel.
Attention: do not tape the screw thread of the flow vessel!.
10. Connect the seven leads of the cable to the pH-analyser (see wiring section 5) .

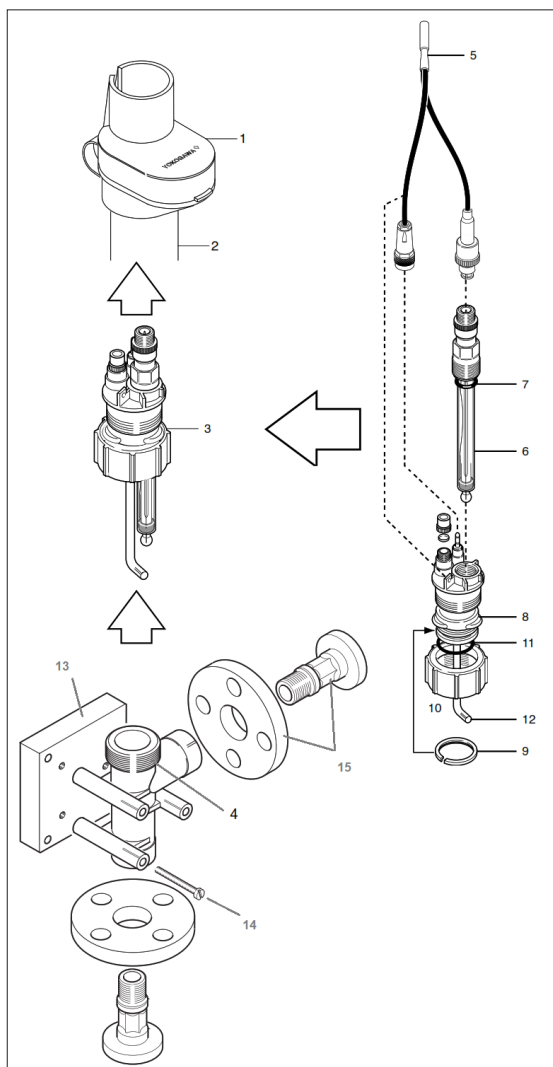
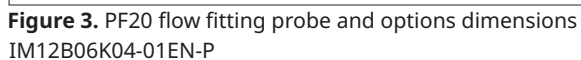


Figure 2: Exploded view PF20

Table 3, PF20: Parts and Options (see fig.2)

No.	Description	No.	Description
1	Rubber cap	4	Flowvessel
2	Protection hood	5	Combination cable
3	Basic holder, incl.:	6	Non-flow electrode (option/EN)
8	Rubber clamping ring	7	O-ring (11x3)
9	Locking ring (*)	13	Wall Mounting plate, incl.:
10	Fixing nut	14	3 bolts (M5x80) (option/WM)
11	O-ring (26.65x2.62)	15	2 Flanges and adapters (option /FC of /FD
12	Liq. earth pin and temp. sensor Spray unit		

(*): flat side of the ring upwards



2.4. Model and Suffix code

Model	Suffix Code		Option code	Description
PF20				Flow pH probe.
Liquid earth	-00			No liquid earth.
	-RH			Liquid earth in Hastelloy 276C.
	-RS			Liquid earth in Stainless steel 316L.
Chemical cleaning	-CH			Chemical cleaning in Hastelloy 276C. (Only available with -00 and -RH.)
	-CS			Chemical cleaning in Stainless steel 316L. (Only available with -00 and -RS.)
Cable length (and tubing length)	-00			No cable (tubing length 10m). (Only available with -00)
	-05			Cable length 5m (tubing length 10m). (Only available with -RH and -RS)
	-10			Cable length 10m (tubing length 10m) (Only available with -RH and -RS)
Temperature compensation	-00			No temperature sensor. (Only available with -00)
	-T1			Temperature sensor Pt1000. (Only available with -RH and -RS)
	-T2			Temperature sensor Pt100. (Only available with -RH and -RS)
Style code		*A		Style A.
Options			/FC	2x DN50-PN10 flanges in reinforced polyester.
			/FD	2x ½" 150Lbs ANSI flanges in reinforced polyester.
			/KR	KCL-reservoir.
			/WM	Wall mounting plate (Use recommended with options /FC and /FD).
			/M	Material certificate 3.1 according to EN 10204 (wetted METAL parts only).

Note: - RS combines with - CS
- RH combines with - CH

3. EXA Compact Direct Insertion probe Model PS20

3.1. General specifications PS20

3.1.1. Materials

Wetted parts

Holder:	Glass-filled PPS
Earth pin:	Stainless steel 316L or Hastelloy 276C
O-ring:	Viton
Weld in adapters:	Stainless steel 316
T-piece with adapter:	Stainless steel 316 or Polypropylene

Non-wetted parts

Cap:	EPDM rubber
Protection hood:	Polypropylene

3.1.2. Operating range

Temperature:	0-70°C
Pressure: limits:	0-2 bar (0-200 kPa)
Flow rate:	max. 20 L/min.
Electrodes:	SC21C-AGP64 SC21C-AGP26 SC21C-AGC55 SC29C-PTC55 SC29C-PTP29 12 mm sensors with PG13.5 connector

3.1.3 Shipping details

Package size (LxWxH):	325 x 240 x 250 mm (Without options)
Package weight (max):	±0.50 kg (with electrode) ±0.75 kg (with T-piece) ±1.00 kg (with T-piece in SS316) ±0.65 kg (with welding socket)

3.1.4 Process connections

ISO 228/1-G1 female, ISO 7/1-R 1¼, ANSI B 1.20.6M 1"NPT, Welding socket angled / straight

3.2. Installation and mounting of PS20 probe

3.2.1. Selection of installation site

- Install the probe in a place where it can be maintained easily and safely.
(Attention: for maintenance or replacing the electrode a space of $\pm 0.3\text{m}$ above the top of the probe is required)
- Mount the Compact Direct Insertion Probe into the process so that the electrode is in a position shown in fig.4
- The Direct Insertion Probe is ideal for installation directly in a flow line or tank. Preferably the Direct Insertion Probe should be mounted between 2 isolation valves in a position as indicated in fig. 5 Mounted in this way maintenance is easy and in flow conditions the tip of the electrode will always stay wetted

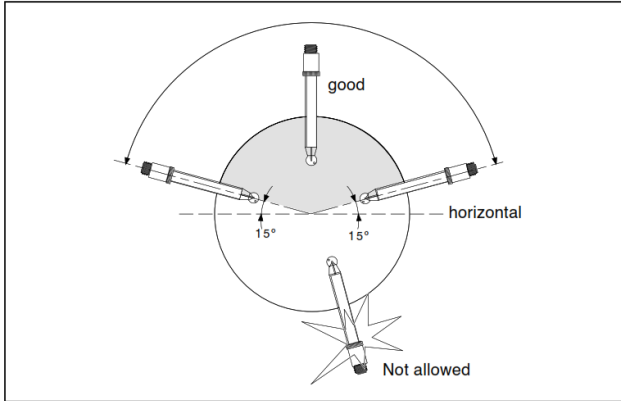


Figure 4. Electrode minimum angle

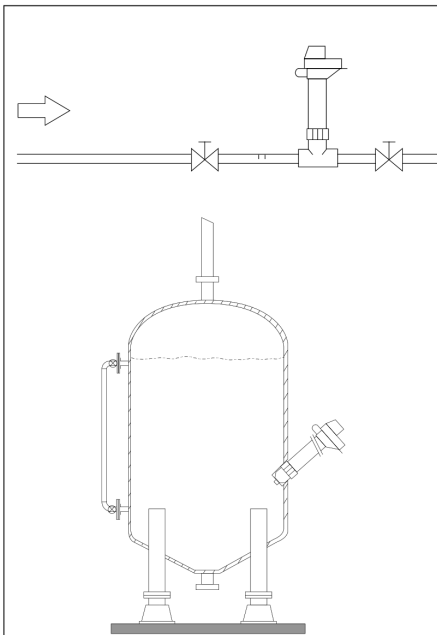


Figure 5. Mounting examples

3.2.2. Mounting PS20 probe

(see fig. 6 and table 4)

1. Push the rubber cap (1) onto the protection hood (2)
2. Open the rubber cap and guide the combination cable (5) through the protection hood.
3. Screw the electrode (5) with "O"-ring (6) into the basic holder (3)
4.
 - a. Connect the combination cable (5) onto the electrode and liquid earth connector of the basic holder (see fig. 6).
 - b. Connect the clip of the chain at the hole of the basic holder. This has a cable release function.
5. When using an EXA Compact Probe with chemical cleaning or flow electrode: see 6.2 and 6.3 respectively.
6. Push the protection hood onto the rubber-clamping ring to fix it at the basic holder.
7. Pull at the cable and clamp it into the middle 'hole' (cut out) of the rubber cap (fig 12). Close the rubber cap.
8. **Attention:** check if the "O"-ring (11) is still in place in the basic holder. Now the Direct Insertion Probe can be easily screwed onto a 1 1/4" BSP male process connection (like all options have) by screwing the fixing nut (9) handtight.
Attention: do not tape the screw thread of the process connection!
9.
 - a. Optional adapters with process connections 1 1/4" BSPT male (12) or 1" NPT male (14) have to be taped only at the process side!. They are also used in combination with the optional T-pieces (13 and 15).
 - b. Optional welding sockets for direct mounting into a pipeline or tank can be welded straight (17) or angled (16), but the electrode must be in a position as shown in fig. 4.
10. Connect the seven leads of the cable on the pH-analyser (see wiring section 5).

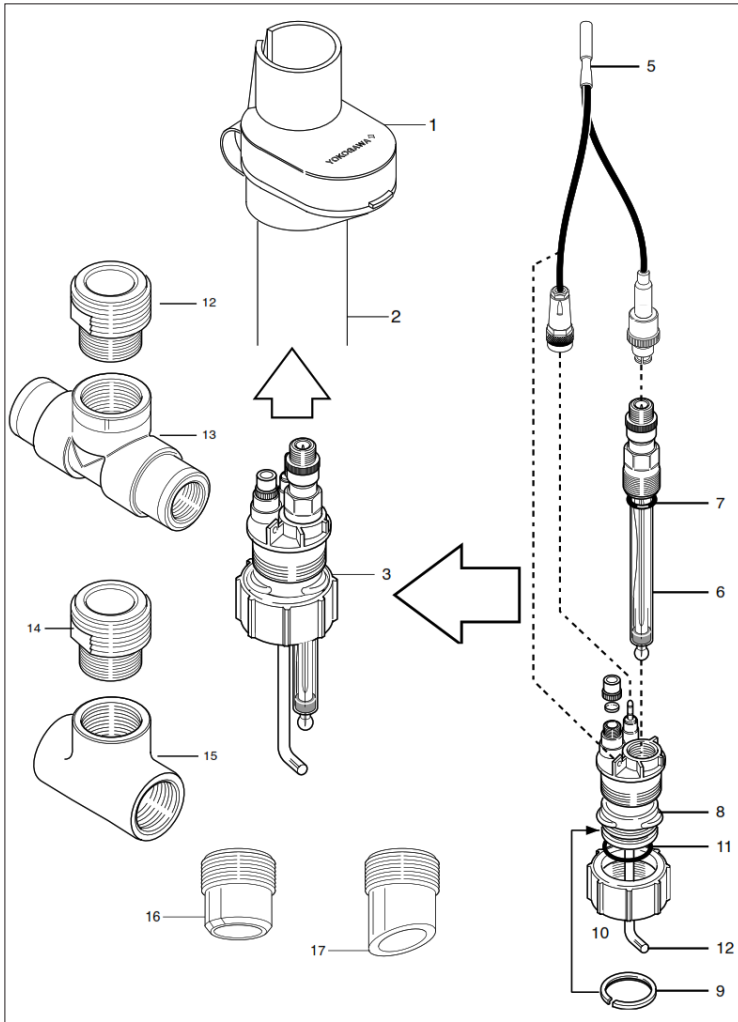


Figure 6. Exploded view PS20

Table 4, PS20: Parts and Options

No.	Description	No.	Description
1	Rubber cap	4	Combination cable
2	Protection hood	5	Non-flow electrode (option/EN)
3	Basic holder, incl.:	6	O-ring (11x3)
8	Rubber clamping ring	12	Adapter in PP (option /NP)
9	Locking ring (*)	13	T-piece in PP (option /TP)
10	Fixing nut	14	Adapter in SS316 (option /NS)
11	O-ring (26.65x2.62)	15	T-piece in SS316 (option /TS))
12	Liquid earth pin and temp. sensor	16	Angle welding socket (option /WA)
	Spray unit	17	Straight welding socket (option /WS)

(*): flat side of the ring upwards

3.3. Dimensions

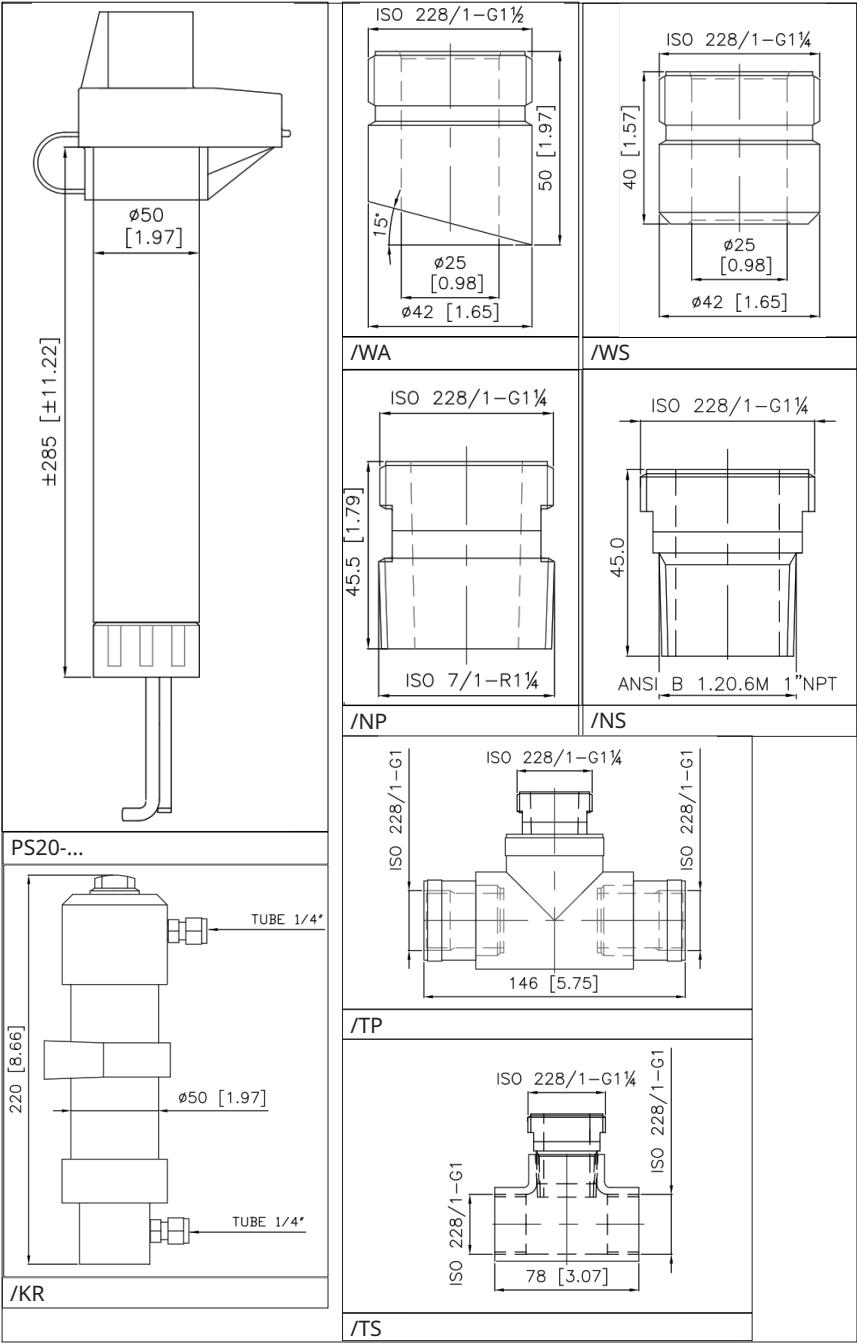


Figure 7. PS20 subassembly probe and options dimensions

IM12B06K04-01EN-P

3.4. Model and Suffix code

Model	Suffix Code		Option code	Description
PS20				Direct insertion pH probe.
Liquid earth	-00			No liquid earth.
	-RH			Liquid earth in Hastelloy 276C.
	-RS			Liquid earth in Stainless steel AISI 316L.
Chemical cleaning	-CH			Chemical cleaning in Hastelloy 276C. (Only available with -00 and -RH)
	-CS			Chemical cleaning in Stainless steel
				AISI 316L. (Only available with -00 and -RS)
Cable length (and tubing length)	-00			No cable (tubing length 10m). (Only available with -00)
	-05			Cable length 5m (tubing length 10m). (Only available with -RH and -RS)
	-10			Cable length 10m (tubing length 10m). (Only available with -RH and -RS)
Insertion length		0		Always 0
Temperature compensation	-00			No temperature sensor. (Only available with -00)
	-T1			Temperature sensor Pt1000. (Only available with -RH and -RS)
	-T2			Temperature sensor Pt100. (Only available with -RH and -RS)
Style code			*A	Style A.
Options			/KR	KCL-reservoir.
			/NP	ISO 7/1-R1¼ (male PP).
			/NS	ANSI B 1.20.6M 1"NPT (male SS316).
			/TP	T-piece (PP); 2 x ISO 228/1-G1 female (including. option /NP).
			/TS	T-piece (AISI 316); 2 x ISO 228/1-G1 female (including. option /NS).
			/WA	Angle welding (AISI 316).
			/WS	Straight welding (AISI 316).
			/M	Material certificate 3.1according to EN-10204 (wetted metal parts only).

Note:

- RS combines with - CS
- RH combines with - CH

4. EXA Compact Immersion Probe Model PD20

4.1. General specifications PD20

4.1.1. Materials

Wetted parts

Holder:	Glass-filled PPS
Earth pin:	Stainless steel 316L or Hastelloy 276C
O-ring :	Viton
Immersion tube :	High temperature polyvinyl-chloride (PVC-C)
Protection cable :	Reinforced polypropylene
Flange :	Reinforced polypropylene

Non-wetted parts

Cap :	EPDM rubber
Protection hood :	Polypropylene
Wall Mounting :	Polypropylene

4.1.2. Operating range

Temperature :	0-70°C
Pressure :	0-0.5 bar (50kPa)
Flow speed :	0-5 m/s
Electrodes :	SC21C-AGP64 SC21C-AGP26 SC21C-AGC55 SC29C-PTC55 SC29C-PTP29 12 mm sensors with PG13.5 connector

4.1.3 Shipping details

Package size (LxWxH):	325 x 240 x 250 mm (Without insertion tube and options)
Package weight (max):	±1.0 kg (1 mtr. probe) ±1.6 kg (2 mtr. probe) ±0.35 kg (flange)

4.1.4 Process connections

Flange (PP), DN 50 (holes acc. to PN10), 2" (holes acc. to ANSI) or 2 Clamps (PP) for wall mounting

4.2. Installation and mounting of PD20 probe

4.2.1. Selection of installation site

- The immersion probe is ideal for installation in open or closed tanks or channels
- Install the probe in a place where it can be maintained easily and safely.

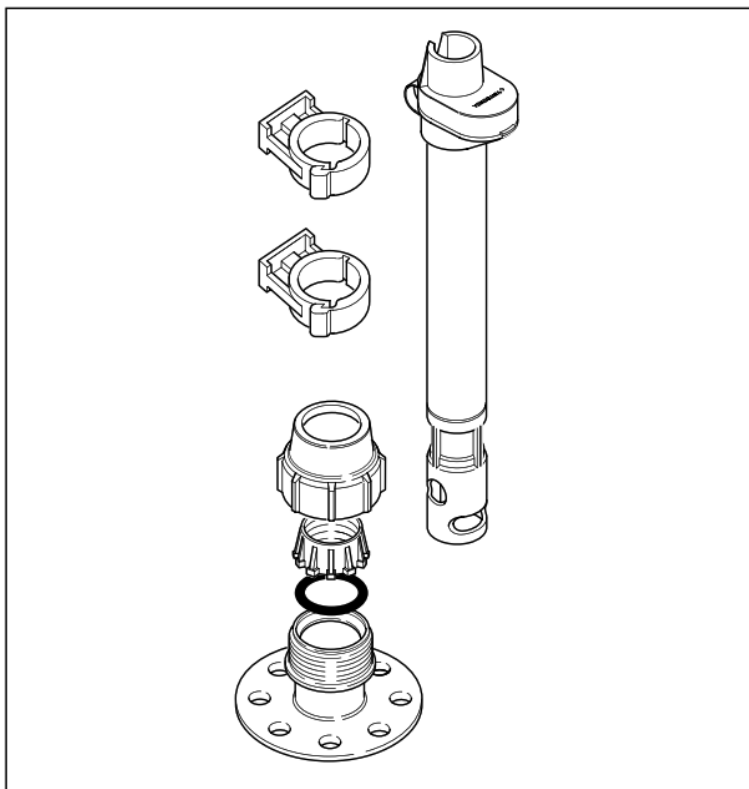


Figure 8. Mounting of the immersion fitting

4.2.2. Mounting PD probe

(see fig.9 and table 5)

1. Push the rubber cap (1) onto the top of the immersion tube (2). The bottom end of the immersion tube -the process side- has a cam inside!
2. An optional adjustable flange (12) must now be pushed onto the immersion tube from the bottom end. By unscrewing the nut and the flange, it can be slid onto the tube and fixed at any desired position.
3. Open the rubber cap and guide the connection cable (5) through the protection hood.
4. Screw the electrode (6) with O-ring (7) into the basic holder (3).
5. a. Connect the combination cable (5) onto the electrode and liquid earth connector of the basic holder (see fig. 9)
b. Connect the clip of the chain at the hole of the basic holder.
This has a cable tension release function.
6. When using an EXA compact probe with chemical cleaning or flow electrode: see chapter 6.2 and 6.3 respectively.
7. a. Slightly unscrew the protection cage (4) from the basic holder (3) in such a way that the 2 O-rings (8) are not in the clamping/sealing position anymore.
b. Push the basic holder with protection cage into the bottom end of the immersion tube, which has a fold inside.
c. Push the basic holder into the bottom into the bottom end of the immersion tube aligning the white spot opposite to the inside cam. Twist it clock-wise until it fits tight.
d. Screw the protection cage tight onto the basic holder (the fold inside will keep the basic holder in place), the 2 O-rings (8) will expand and together with O-ring (10) they form a watertight seal.
8. Pull the cable and clamp it into the middle "hole" (cut out) of the rubber cap (fig. 12). Close the rubber cap.
9. Optional wall mounting clamps (fig.8) can be used to secure the immersion tube in any desired vertical position. It is also possible to use the optional flange for mounting.
10. Connect the seven leads of the cable at the pH analyser (see wiring section 5).

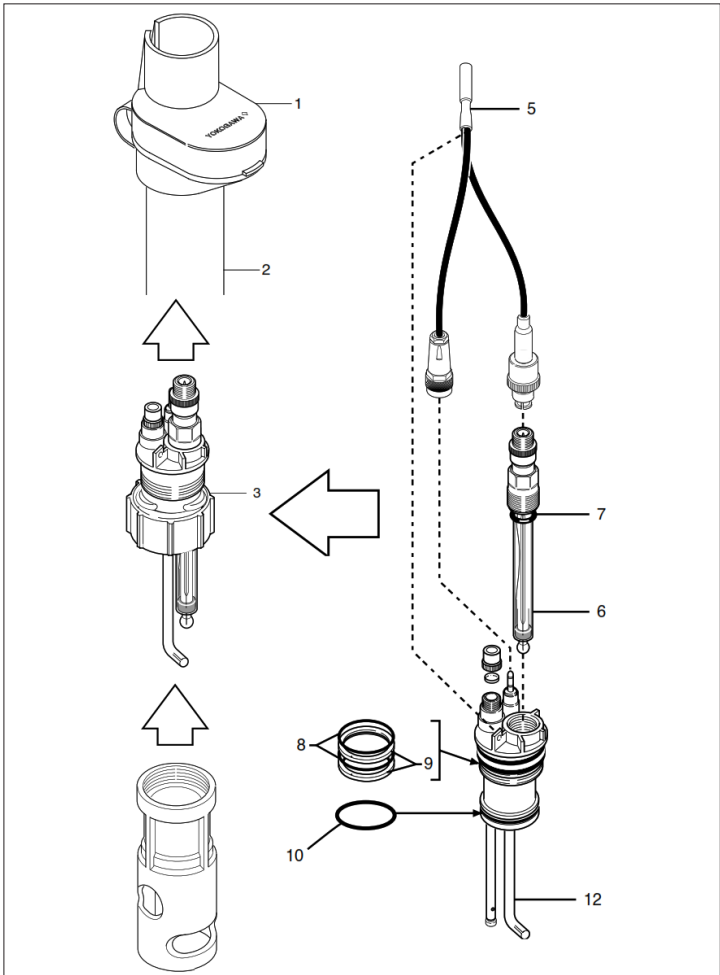


Figure 9. Exploded view PD20 immersion fitting

Table 5. PD20: Parts and Options

No.	Description	No.	Description
1	Rubber cap	4	Protection cage
2	Immersion tube	5	Combination cable
3	Basic holder, incl.:	6	Non-flow electrode (option /EN)
8	2 "O"-ring (37.77x2.62)	7	"O"-ring (11x3)
9	2 PVDF rings	12	Adjustable flange (option /FA)
10	"O"-ring (31.42x2.62)	13	2 Wall mounting clamps (option /CW)
11	Liquid earth pin and temp. sensor		
	Spray unit (Optional)		

4.3. Dimensions

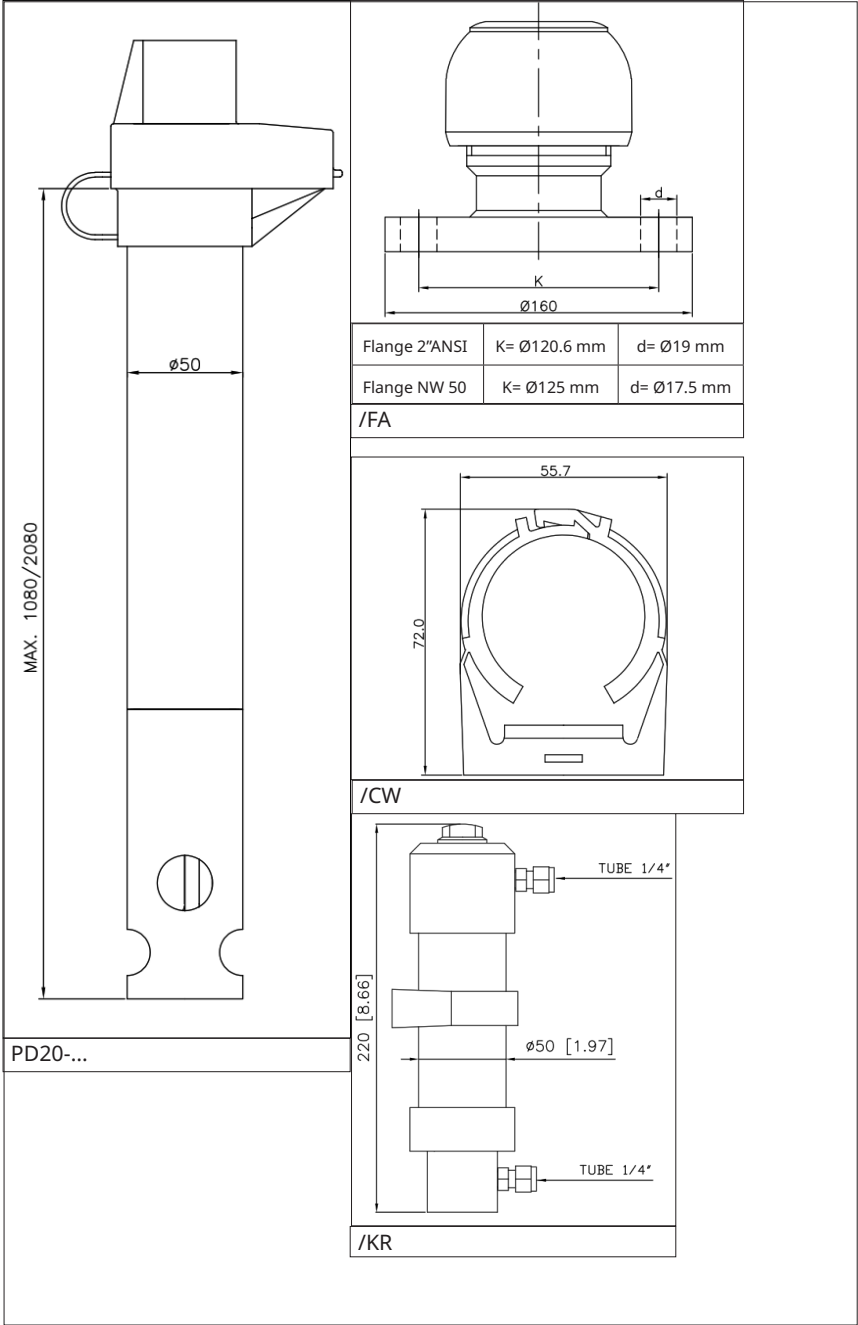


Figure 10. PD20 immersion probe and options dimensions
IM12B06K04-01EN-P

4.4. Model and Suffix code

Model	Suffix Code		Option code	Description
PD20				Immersion pH probe
Liquid earth	-00			No liquid earth.
	-RH			Liquid earth in Hastelloy 276C.
	-RS			Liquid earth in Stainless steel AISI 316L.
Chemical cleaning	-CH			Chemical cleaning in Hastelloy 276C. (Only available with -00 and -RH)
	-CS			Chemical cleaning in Stainless steel AISI 316L. (Only available with -00 and -RS)
Cable length (and tubing length)	-00			No cable for use with VP sensors
	-05			Cable length 5m (tubing length 10m). (Only available with -RH and -RS)
	-10			Cable length 10m (tubing length 10m). (Only available with -RH and -RS)
Lengths of insertion tube	1			1m (adjustable on site)
	2			2m (adjustable on site)
Temperature compensation	-00			No temperature sensor. (Only available with -00)
	-T1			Temperature sensor Pt1000. (Only available with -RH and -RS)
	-T2			Temperature sensor Pt100. (Only available with -RH and -RS)
Style code		*A		Style A.
Options			/KR	KCL-reservoir.
			/FA	Flange (PP), DN 50 (holes acc. to PN10) and 2" (holes acc. to ANSI)
			/CW	2 Clamps (PP) for wall mounting (not available with option /FA.)
			/M	Material certificate 3.1 according to EN-10204 (wetted metal parts only).

5. Wiring EXA Compact Probes - Diagram

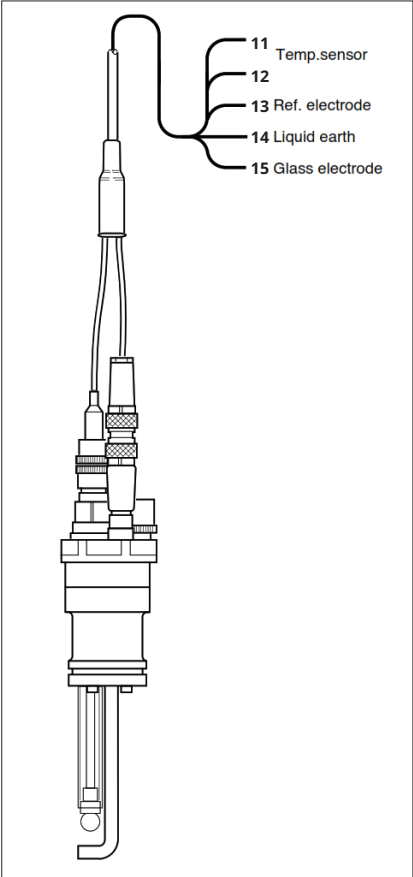


Figure 11: Wiring of immersion fitting

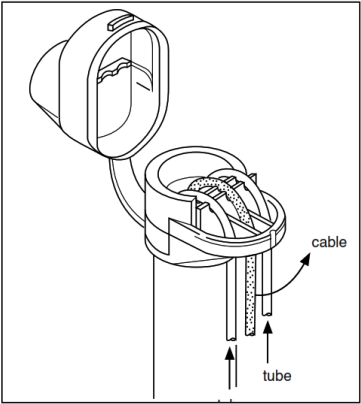


Figure 12. Tubing and cabling leads

Table 6. Terminal numbering and wire color

Number	Color	Function
11.	Red	Temperature compen- sation
12.	Blue	
13.	Braon	Core reference electrode
14.	Yellow	Liquid earth
15.	White	Core pH electrode

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6. EXA compact probe maintenance

6.1. General maintenance procedure

1. By simply unscrewing the fixing nut (10) and lifting up the basic holder from the flow vessel, the electrode is accessible for calibration or inspection.
2. To get access to the connections at the top of the basic holder, first open the rubber cap and pull the cable upward out of the middle 'hole' of the cap (see fig.12). When tubes for KCl or chemical cleaning agent are used they must be pushed upwards through the holes to create space. Then the protection hood-with cap can be easily lifted from the basic holder.
3. Now the electrode can be removed very easily without twisting the cable by unscrewing the PG 13.5 nut at the electrode.
(Attention: the "O"-ring at the electrode should be replaced regularly to prevent leakage).
4. All "O"-rings at the basic holder should be checked frequently to ensure a proper watertight sealing.

6.2. Mounting and maintenance of Automatic Chemical Cleaning

After the combination cable is connected at the basic holder the tube used for chemical cleaning (OD = 1/4", l=5 or 10 mtr.) can be mounted.

1. Guide the tube through one of the outer holes of the rubber cap (see fig. 12) and through the protection hood or immersion tube towards the basic holder. Remove the plug.
2. Mount the connector at the chemical cleaning tube as shown in fig. 14.
3. Push the tube into the spray unit connection at the basic holder and seal it with the nut.
4. Pull the tube through the rubber cap and close the cap.
5. Connect the other end of the tube at a pump or solenoid valve.
6. The connections used for chemical cleaning should be checked frequently to prevent leakage.

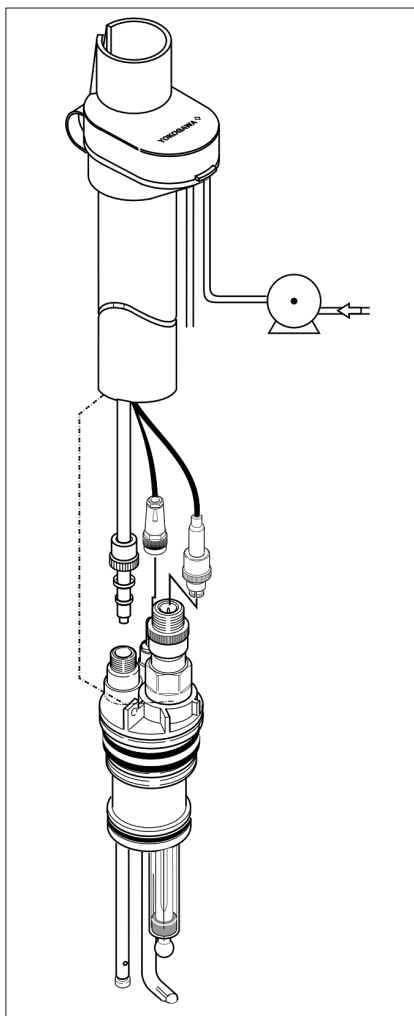


Figure 13: Connection of tubing to the basic holder

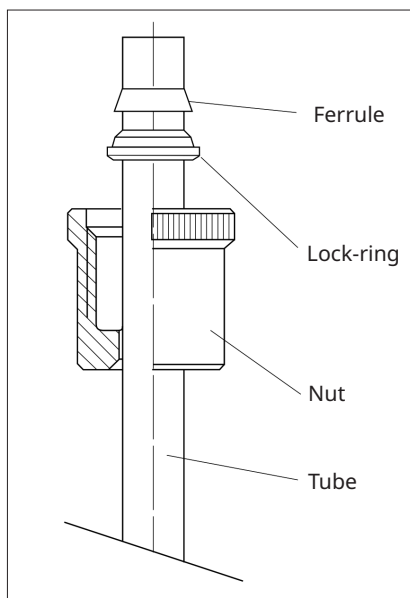


Figure 14: Connection of chemical cleaning/KCI tubing

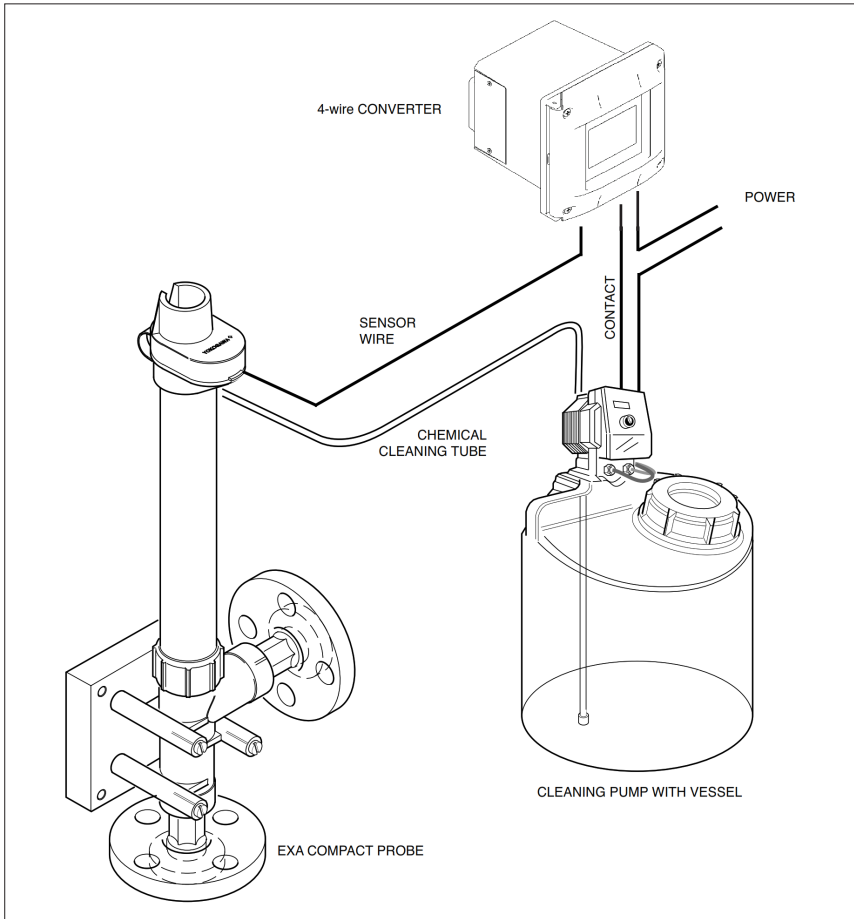


Figure 15: Cleaning setup

6.3. Mounting and maintenance of flow electrode with KCl reservoir

After the combination cable is connected onto the basic holder, the tube used for KCl (OD = 1/4", I=0.55 or 1.55/2.55) can be mounted.

1. Guide the tube through one of the outer holes of the rubber cap (see fig. 12) and the protection hood or immersion tube towards the flow electrode.
2. Mount the connector at the KCl tube as shown in fig. 14.
3. Push the tube into the KCl connection at the flow electrode and seal it with the nut.
4. Pull and stretch the tube at the rubber cap and close the cap.
5. Connect the other end of the tube at the KCl reservoir which should be placed on the top of the rubber cap (see fig. 16). This causes a hydrostatic pressure on the KCl solution and therefore a positive outflow of KCl through the diaphragm of the electrode.
6. Fill the KCl reservoir with 1 mol. KCl solution by unscrewing the cover at the top. Check the KCl level regularly.

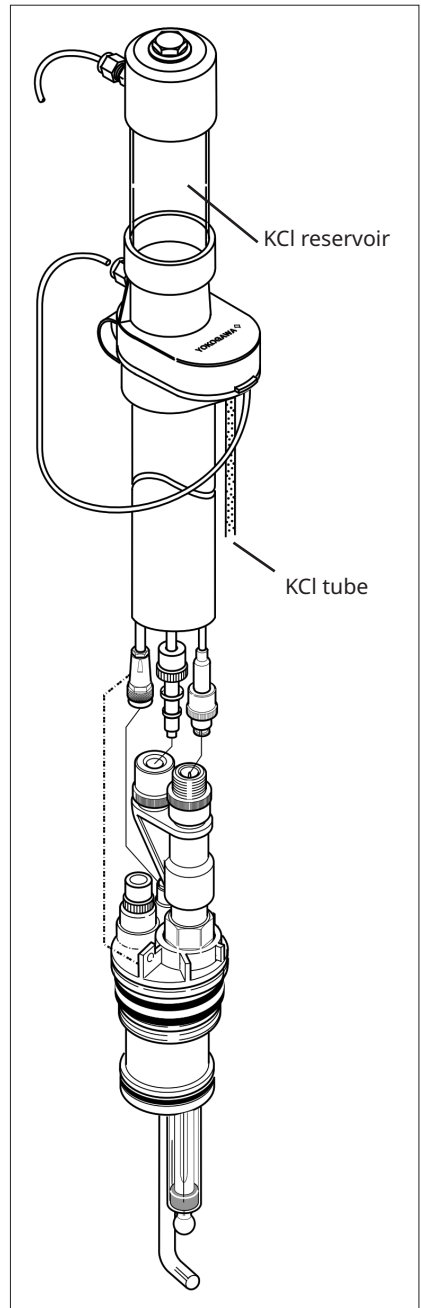


Figure 16: Connection of KCL tubing

7. Spare parts EXA probes

Table 7: Spare parts list

Ms-code	Part group	Description	PD20	PF20	PS20
K1500AE	O-ring	O-ring set viton, PF/PS20 (5)		x	x
K1500AJ		O-rings EPDM for /FA (2pcs)	x		
K1500BZ		O-rings Viton 11x3 (6Pcs)	x	x	x
K1500ES		O-ring set EPDM FF20-P&F33/3B		x	
K1500FK		O-ring set Viton FF20P&F22		x	x
K1520ZB		O-ring set viton, for PD20	x		
K1542DL		O-rings EPDM FDA 20.3x2.62 (3)	x	x	x
K1542DM		O-rings silicone 20.3X2.62 (3)	x	x	x
K1500YA	Options	/CW, clamps (PP), PD20	x		
K1500YC		/FC, flanges DN15 PN10, PF20		x	
K1500YD		/FD, flanges 1/2" NPT		x	
K1520CZ		/NP for PS20 (1 1/4"BSPT),PP			x
K1520EV		/FA for ISC40FD and PD20	x		
K1520GF		/WM for PF20		x	
K1520YA		/KR for PD/PF/PS20 holders	x	x	x
K1520YE		/TP (PP) for PS20			x
K1520YF		/TS (SS) for PS20			x
K1500AD	Holders	Screw set for PF20/WM (3pcs)		x	
K1520BR		Basic holder, PD20-RS-CS-T1	x		
K1520BS		Basic holder, PD20-RS-CS-T2	x		
K1520BT		Basic holder, PD20-RH-CH-T1	x		
K1520BU		Basic holder, PD20-RH-CH-T2	x		
K1520BV		Basic holder, PF20/PS20-RS-CS-T1		x	x
K1520BW		Basic holder, PF20/PS20-RS-CS-T2		x	x
K1520BX		Basic holder, PF20/PS20-RH-CH-T1		x	x
K1520BY		Basic holder, PF20/PS20-RH-CH-T2		x	x
K1520DZ	Adapters	Adapter 1"NPT-male, SS			x
K1520EJ		Straight weld-in adapter, SS			x
K1520EK		Angled weld-in adapter, SS			x
K1520DS	Pipe and protection tubes	Pipe, 2 meter for PD20	x		
K1520DT		Protection tube for PF/PS20		x	x
K1520DU		Pipe, 1 metre for PD20	x		
K1520ZD		PPS MOUNTING NUT FOR PS20/PF20		x	x
K1520DC	Accessories	Flow chamber for PF20		x	
K1520DG		Protection cage for PD20	x		
K1520EA		Rubber cap for P*20	x	x	x
K1520ET		Spraying valve for P*20	x	x	x
K1520FA	Tubing	Ferrule set PEEK/PTFE	x	x	x
K1520FJ		Tubing set, chem. cleaning 5m	x	x	x
K1520FK		Tubing set, chem. cleaning 10m	x	x	x
K1530UL		Tubing for FD30/JC, 10 metre	x	x	x
K1547PH		10 m PVDF Tube and mounting	x	x	x
K1500DW	Cables and nuts	Set of 12 cable nuts for WU20	x	x	x
K1520YN		PD/PF/PS20 cable, 5 meter	x	x	x
K1520YP		PD/PF/PS20 cable, 10 meter	x	x	x


8. Chemical compatibility chart

Table 8: Material compatibility chart

				Wetted Material															
				Viton		EPDM		Silicon		SS 316(l)		Hastelloy C276		PP		PVC		PPS (Ryton)	
				20	60	20	60	20	60	20	60	20	60	20	60	20	60	20	60
Inorganic acid	Sulfuric acid	Conc.%	Temp. °C	o	o	o	o	o	o	x	x	o	o	o	o	o	x	o	o
		10		o	o	o	x	-	-	x	x	o	o	o	o	o	o	x	x
		50		o	o	x	-	-	-	x	x	o	o	o	o	o	o	x	x
		95		o	o	x	-	-	-	x	x	o	x	x	-	x	x	x	x
	Hydrochloric acid	fuming		o	o	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		10		o	o	o	o	x	-	-	-	o	o	o	o	o	x	o	o
		sat.		o	o	x	x	x	-	-	-	o	o	o	o	o	o	o	o
	Nitric acid	25		o	o	o	x	o	o	x	x	o	o	o	o	o	x	o	o
		50		-	-	-	-	x	-	x	x	o	o	x	-	o	x	x	x
		95		-	-	-	-	-	-	o	o	o	o	-	-	-	-	-	-
		fuming		-	-	-	-	-	-	o	o			-	-	-	-		
	Phosphoric acid	25		o	o	o	o	o	o	-	-	o	o	o	o	o	x	o	o
		50		o	o	o	o	o	o	x	x	o	o	o	o	o	o	o	o
		95		x	x	o	o	o	x	o	o	o	o	o	o	o	o	o	o
	Hydrofluoric acid	40		o	o	-	-	-	-	-	-	o	o	o	o	o	x	x	x
		75		o	o	-	-	-	-	-	-	o	o	o	o	x	x	-	-
Organic acid	Acetic acid	10		-	-	o	o	o	o	o	o	o	o	o	o	o	x	o	o
		glacial		-	-	x	x	o	o	o	o	o	o	o	x	x	x	o	
	Formic acid	80		-	-	o	o	o	o	x	x	o	o	o	o	o	-	o	o
	Citric acid	50		o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
Alkali	Calcium hydroxide	sat.		o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
	Potassium hydroxide	50		o	o	o	x	o	o	o	o	o	o	o	o	o	o	o	o
	Sodium hydroxide	40		x	x	o	x	o	o	o	o	x	-	o	o	o	x	o	o
	Ammonia in water	30		x	x	o	o	o	o	o	o	o	o	o	o	o	x	o	o
Acid salt	Ammonium chloride	sat.		o	o	o	o	o	o	x	x	x	-	o	o	o	o	o	o
	Zinc chloride	50		o	o	o	o	o	o	x	x	o	o	o	o	o	o	o	o
	Iron(III) chloride	50		o	o	o		o	o	-	-			o	o	o	o	o	
	Sodium sulfite	sat.		-	-	o	o	o	o	o	o	o	o	o	o	o	o	o	o
Basic salt	Sodium carbonate	sat.		o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
	Potassium chloride	sat.		o	o	o	o	o	o	x	x	o	o	o	o	o	o	o	o
	Sodium sulfate	sat.		o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
	Calcium chloride	sat.		o	o	o	o	o	o	x	x	o	o	o	o	o	o	o	o
Neutral salt	Sodium chloride	sat.		o	o	o	o	o	o	x	x	o	o	o	o	o	o	o	o
	Sodium nitrate	50		o	o	o	o	o	o	x	x	o	o	o	o	o	o	o	o
	Aluminium chloride	sat.		o	o	o	o	o	o	-	-	o	o	o	o	o	o	o	o
	Hydrogen peroxide	30		o	o	o	x	x	o	o	o	o	o	o	o	o	x	-	
Oxidizing agent	Sodium Hypochloride	50		o	o	o	o	o	o	x	x	o	o	x	x	x	x	x	
	Potassium dichromate	sat.		o	o	o	o	o	o	o	o	o	o	o	o	o	o	x	
	Chlorinated lime							o	o	x	x			-	-	o	o		
	Ethanol	80		x	-	o	o	o	o	o	o	o	o	o	o	o	x	o	o
Organic solvent	Cyclohexane			o	o	-	-	-	-	o	o	o	o	-	-	o	o	o	o
	Toluene			-	-	-	-	-	-	o	o	o	o	x	-	-	-	o	o
	Trichloroethane			x	x	-	-	-	-	o	o	o	o	-	-	-	-	o	o
	Water			o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o

o = can be used x = shortens useful life - = cannot be used Blank = no data currently available

Note : Information in this list is based on our general experience and literature data and given in good faith. However Yokogawa is unable to accept responsibility for claims related to this information.

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