

General Specifications

Model FF20/FS20
Flow Fittings for pH/ORP
(Redox) measuring loops

pH/ORP

For liquid analysis, the sensors are usually mounted in either a flow or an immersion fitting. Therefore Yokogawa has invested considerable design and development time in producing a full range of fittings with particular emphasis on designs that reduce installation and maintenance time and consequently save operation costs.

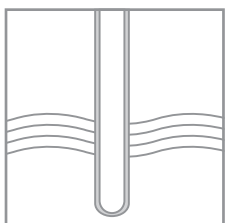
A high degree of standardisation makes it possible to mount electrodes with DIN dimensions directly into a fitting. For most other types a mounting kit (accessory) is available. A wide choice of construction materials gives the user the optimal solution for any process considering chemical resistance, pressure and temperature specifications. The program includes fittings and subassemblies for mounting of a variety of electrodes and/or a cleaning system.

Features

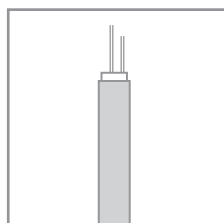
- Wide choice of construction materials.
- High degree of standardisation reduces spare holding requirements.
- Direct mounting of sensors with DIN dimensions.
- Liquid earth pin for stable measurements.
- High pressure and temperature specifications.
- Chemical cleaning system as an option for 2-, 3- and 4-hole fitting.
- Brush cleaning system as an option for 4-hole fitting only.
- Electrolytically polished stainless steel fittings for optimal corrosion resistance.



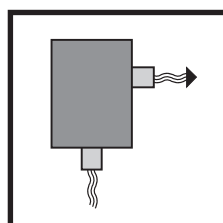
System Configuration



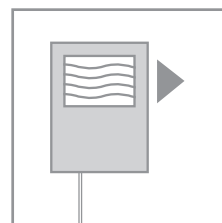
Sensors



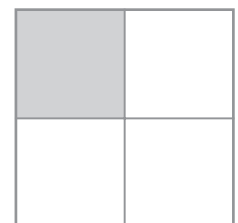
Cables



Fittings



Transmitters



Accessories

Flow Fittings

From a practical plant aspect, the optimal mounting place of a sensor is in a by-pass behind a sample valve. For these applications the complete flow fittings are the optimal solution. They are provided with a ring to hold a calibration dish for easy cleaning and maintenance.

Features

- Easy calibration and maintenance using the calibration dish.
- Changeable liquid outlet position (right or left).
- Wall mounting bracket.
- Possible to decrease temperature and/or pressure.



FF20-F43

In-line measurement

- Real-time measurement gives better process control
- Low stability and short life by exposure to process P/T
- Limited access for maintenance
- High operating costs under severe process conditions

In-Line is direct

Subassemblies

The subassemblies are the optimal solution for mounting sensors directly in a piping system. They can be easily adapted to the process piping by welding or cementing. The subassemblies of stainless steel meet the requirements of DIN 11850 and DIN 11851 for mounting in sanitary constructions.

Features

- Suitable for mounting in a T-piece or directly in the piping system by cementing or welding.
- Online installation generating a fast response to process changes.



FS20-V12



FS20-S32



FS20-P22

On-line measurement

- Control errors possible by time delay, Pressure / Temperature drop
- High stability by sample conditioning
- Easy maintenance and repair
- Sampling pitfalls under mild process conditions

On-line is easy to maintain

General Specifications

Materials

- Wetted parts
 - A. Body (refer to model code): Polypropylene (PP)
 - Stainless steel AISI 316 (SS)
 - Polyvinylchloride (PVC)
 - Polyvinylidene fluoride (PVDF)
 - B. O-rings : Silicone rubber/Viton
 - C. Liquid earth sensor : Titanium (in plastic design)
 - (not in 1-hole subassy) : Stainless steel AISI 316 (in SS design)
- Mounting brackets : Stainless steel AISI 316 (for SS design)
 - Polyvinylchloride (for plastic design)
- Electrode mounting sets : Rytan R 4
- Holder for calibration dish : Stainless steel AISI 316
- Calibration dish : polyethylene
- Retaining nut for electrode holder : Stainless steel AISI 304

Volume measuring vessel

- 2-hole fitting : 130 ml
- 3-hole fitting : 130 ml
- 4-hole fitting : 250 ml

Process connections for fittings

- 2-, 3- and 4-hole fitting : 1/2" NPT or flange LAP-joint (DIN or ANSI) see model code

Nominal pipe size for mounting subassemblies

- 1-hole : DN20
- 2-hole : DN50
- 3-hole : DN50
- 4-hole : DN80

Weight* : See tabel 1

Table 1

Fitting \ Material	PP	SS	PVC	PVDF
1-hole subassembly		0.2 kg	0.1 kg	
2-hole subassembly	0.5 kg	1.2 kg	0.5 kg	0.7 kg
3-hole subassembly	0.5 kg	1.2 kg	0.5 kg	0.7 kg
4-hole subassembly		3 kg	1.4 kg	
2-hole flowfitting	1.1 kg	2.2 kg		1.5 kg
3-hole flowfitting	1.1 kg	2.2 kg		1.5 kg
4-hole flowfitting	1.4 kg	6.5 kg		1.8 kg

* The accessories are not included

Functional Specifications

Temperature

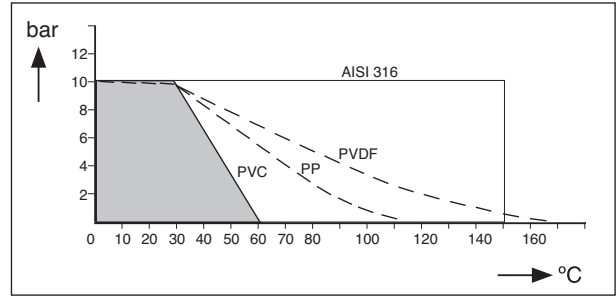
- min. : -10°C
- max. : depending on material and application (see figure 1)

Flow rate (fittings)

: 0.1 to 10 l/min (depending on application)

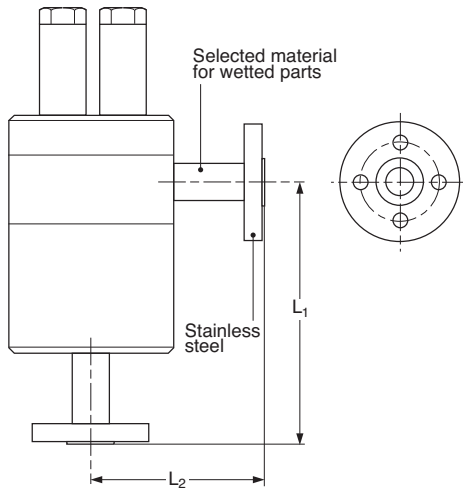
Pressure

: see figure >>>



Pressure/temperature class

Flange adapters (NPT^{1/2} male lap joint)

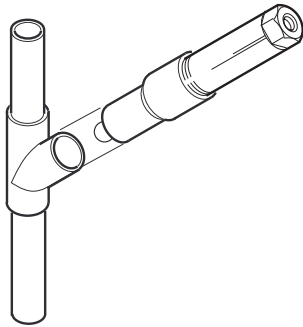


Dimensions

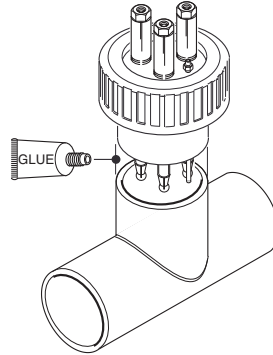
TYPE	FP1-FF1-FS1		FP2-FF2-FS2		FP3-FF3-FS3		FP4-FF4-FS4	
	L1	L2	L1	L2	L1	L2	L1	L2
FF20-S22	143	137	153	147	5.6	5.4	6.0	5.8
FF20-P22								
FF20-F22	180	133	169	122	7.1	5.2	6.6	4.8
FF20-S33	143	137	153	147	5.6	5.4	6.0	5.8
FF20-P33								
FF20-F33	180	133	169	122	7.1	5.2	6.6	4.8
FF20-S43	156	133	166	143	6.1	5.2	6.5	5.6
FF20-P43								
FF20-F43	183	153	172	142	7.2	6.0	6.8	5.6
Flange adapter	DN15	PN10	DN25-PN10		1/2"150lbs		1"150lbs	
Material	PVDF		PVDF		SS316		SS316	

Application examples subassemblies

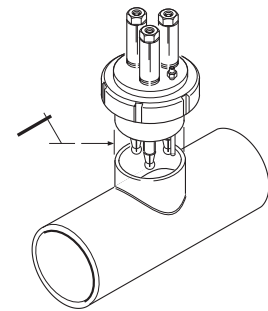
SS/PVC



PVC



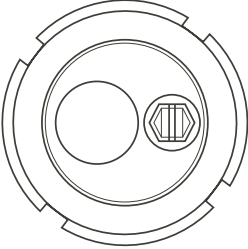
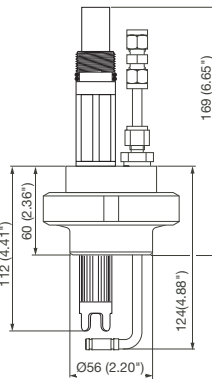
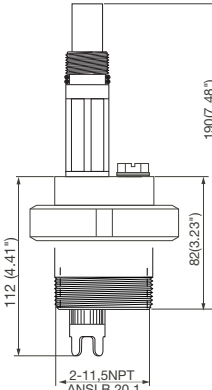
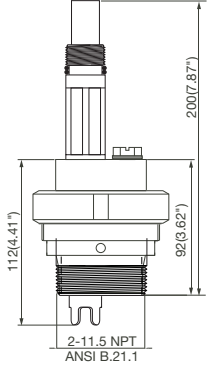
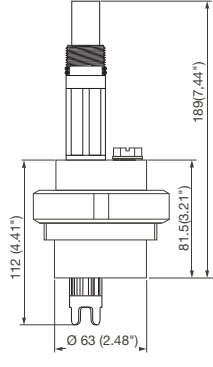
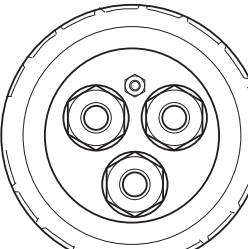
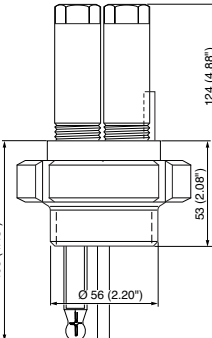
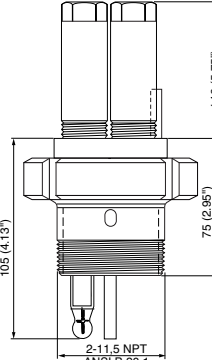
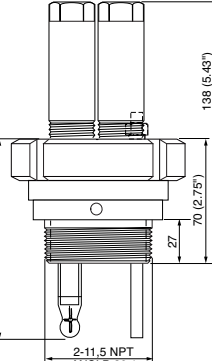
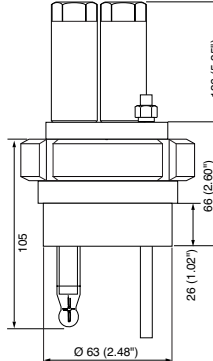
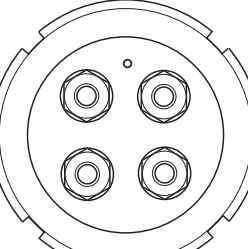
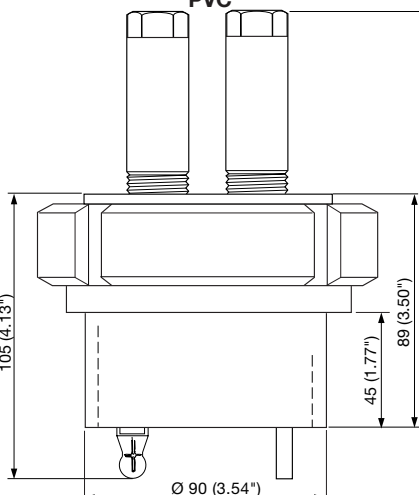
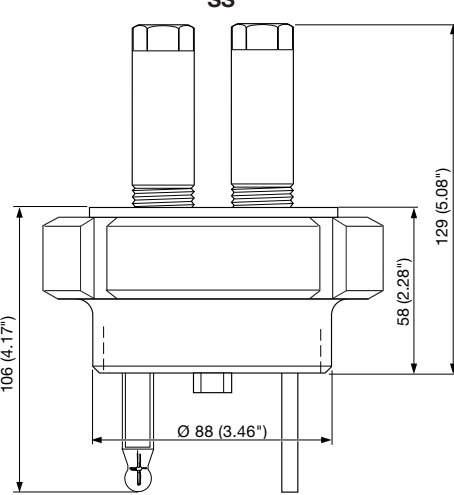
SS



Dimensions

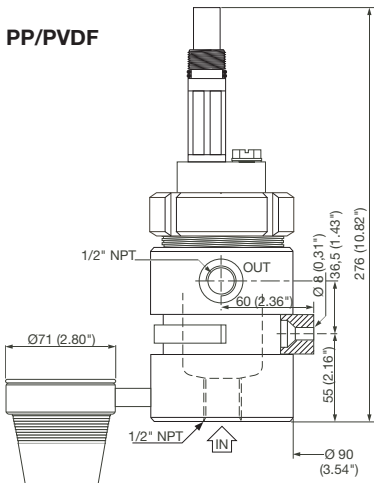
Configurations	Dimensions
<p>1-Hole</p>	<p>SS/PVC</p> <p>(Unit: mm)</p> <p>155 (6.10")</p> <p>105 (4.13")</p> <p>17 (0.67")</p> <p>88 (3.46")</p> <p>Ø22 (0.87") ss design Ø25 (0.98") pvc design</p> <p>Ø28 (1.10") ss design Ø30 (1.18") pvc design</p>

Dimensions (Unit: mm)

Configurations	Subassemblies			
<p>2-Hole</p> 	<p>SS</p>  <p>FS20-S22-WE</p>	<p>SS</p>  <p>FS20-S22-TP</p>	<p>PP/PVDF</p>  <p>FS20-P22-TP FS20-F22-TP</p>	<p>PP/PVC/PVDF</p>  <p>FS20-P22-WE FS20-V22-WE FS20-F22-WE</p>
<p>3-Hole</p> 	<p>SS</p>  <p>FS20-S32-WE</p>	<p>SS</p>  <p>FS20-S32-TP</p>	<p>PP/PVDF</p>  <p>FS20-P32-TP FS20-F32-TP</p>	<p>PP/PVC/PVDF</p>  <p>FS20-P32-WE FS20-V32-WE FS20-F32-WE</p>
<p>4-Hole</p> 	<p>PVC</p>  <p>FS20-V43-WE</p>		<p>SS</p>  <p>FS20-S43-WE</p>	

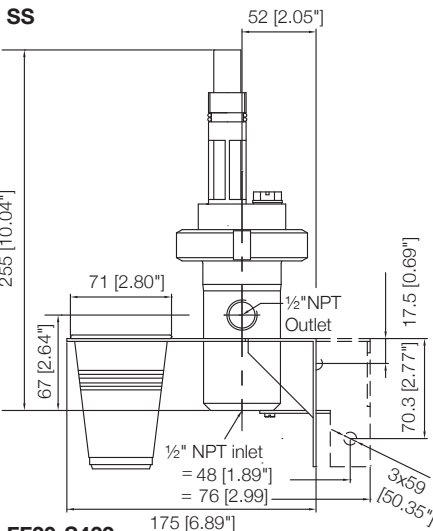
Flow Fittings

PP/PVDF



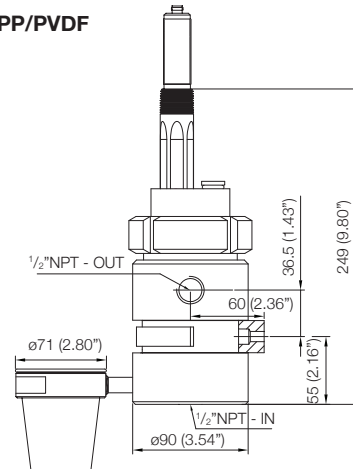
FF20-P22
FF20-F22

SS



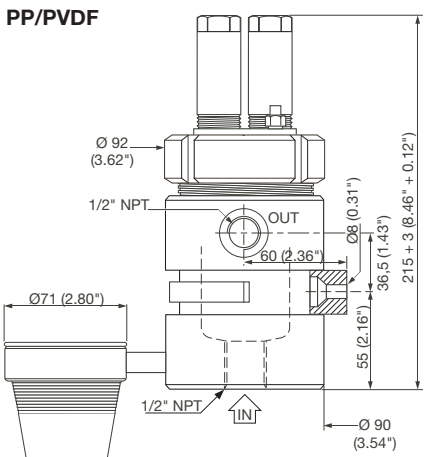
FF20-S422

PP/PVDF



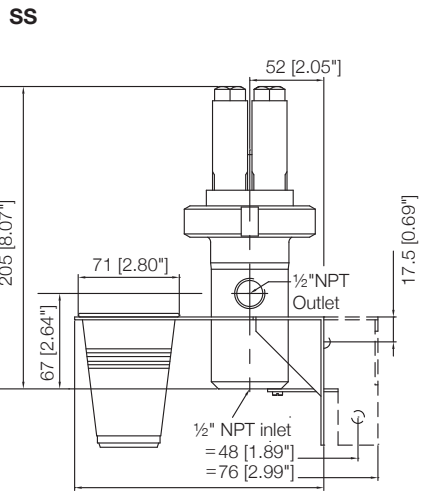
FF20-P3B
FF20-F3B

PP/PVDF



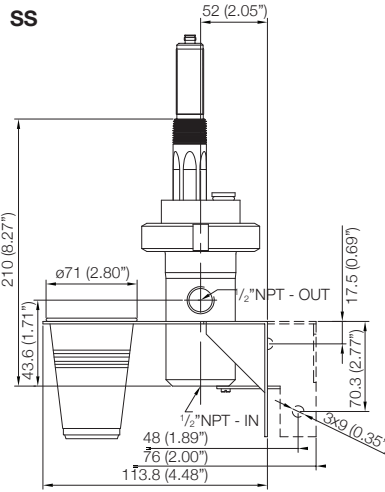
FF20-P33
FF20-F33

SS



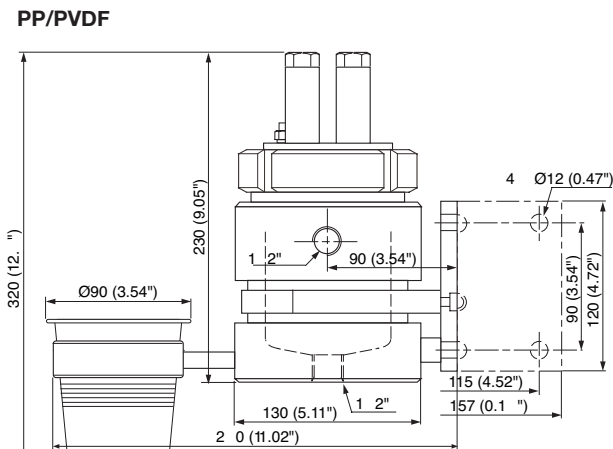
FF20-S33

SS



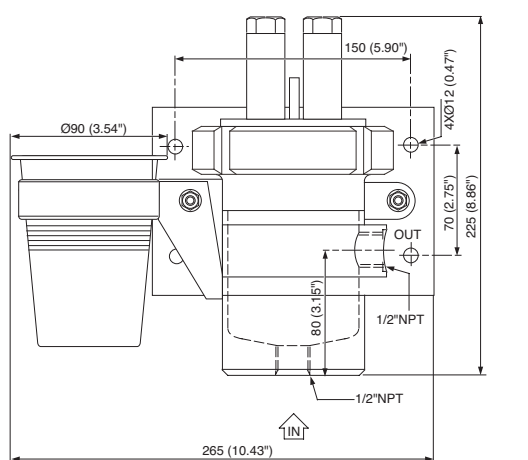
FF20-S3B

PP/PVDF



FF20-P43
FF20-F43

SS



FF20-S43

DISTANCE WALL-OUTLET= 85 (3.35")

Model and Suffix Codes

2.5. Model and codes

2.5.1. Fittings

Model	Suffix Code	Option code	Description
FF20			Flow fitting
Material	-P -S -F		Polypropylene (PP) Stainless steel AISI 316 (SS) Polyvinylidene fluoride (PVDF)
Number of holes	22 33 43 3B		PH20 mounting hole 3 electrode mounting holes 4 electrode mounting holes FU20 mounting hole (for 3 hole fitting)
	*B		Style code B
Options -Cleaning system		/HCN2 /HCN3 /HCN4	Cleaning only for FF20-.22 / FF20-.3B / FF20-.4B Cleaning only for FF20-.33 Cleaning only for FF20-.43
Options -Mounting kit		/B /R	For mounting Bellomatic reference electrodes (SR20-AC32). For mounting (top) refillable electrodes with long glass shaft.
-Flange adapters (NPT 1/2" male lap joint).		/FP1 /FP2 /FP3 /FP4 /FF1 /FF2 /FF3 /FF4 /FS1 /FS2 /FS3 /FS4	DN15-PN10 PP DN25-PN10 PP 1/2" 150 lbs PP 1" 150 lbs PP DN15-PN10 PVDF DN25-PN10 PVDF 1/2" 150 lbs PVDF 1" 150 lbs PVDF DN15-PN10 SS 316 DN25-PN10 SS 316 1/2" 150 lbs SS 316 1" 150 lbs SS 316
-KCl-reservoir		/K	Electrolyte tubing (2.5 m) is included.
-Salt bridge		/S	For liquid which cannot stand contamination with KCl.
-Certificate		/M	Material certificate 3.1 according to EN-10-024(DIN50-049), on SS wetted parts. Not for P3B, P4B, F3B and F4B without /HCN*.

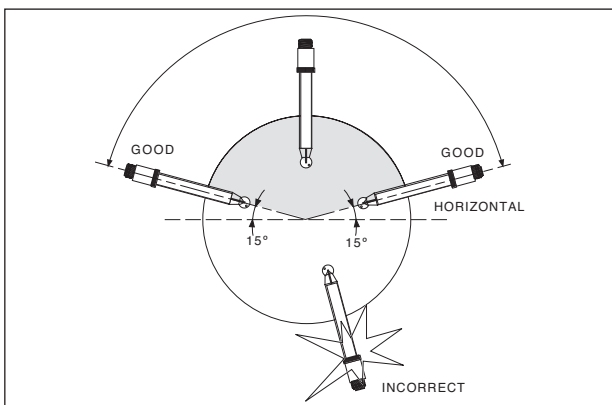


Fig. 2. Mounting positions of electrodes

Notes:

1. Mounting position of electrodes
2. For mounting or replacing the electrodes some space (ca. 20 cm) must be available at the top of the fitting.

2.5.2. Subassemblies (flow fittings)

Model	Suffix Code	Option code	Description
FS20			Subassembly (Flow fitting)
Material	-V -P -S -F		Polyvinylchloride (PVC) Polypropylene (PP) Stainless steel AISI 316 (SS) Polyvinylidene fluoride (PVDF)
Number of holes	12 22 32 43		1 electrode mounting holes (only V,S) For PH20 3 electrode mounting holes 4 electrode mounting holes (only V,S)
Mounting		-WE -TP	Welding end: Type, S12, S22,S32, S43 Glue for PVC: Type V12, V22, V32, V43 Heat welding: Type F22, F32, P22, P32 Tapered pipe thread (2"NPT acc. ANSI B.20.1). (for 2 and 3 holes version, and not in case of type V22 and V32)
Options -Cleaningsystem		/HCN2 /HCN3 /HCN4	FS20- .22 FS20- .33 FS20- .43
Options -Mounting kit		/B /R	For mounting Bellomatic reference electrodes and combined electrodes. For mounting (top) refillable electrodes with long glass shaft.
-KCl-reservoir		/K	Electrolyte tubing (2.5 m) is included.
-Salt bridge		/S	For liquid which cannot stand contamination with KCl.
-Certificate		/M	Material certificate 3.1 according to EN-10-204 (DIN 50-049) (on wetted parts).

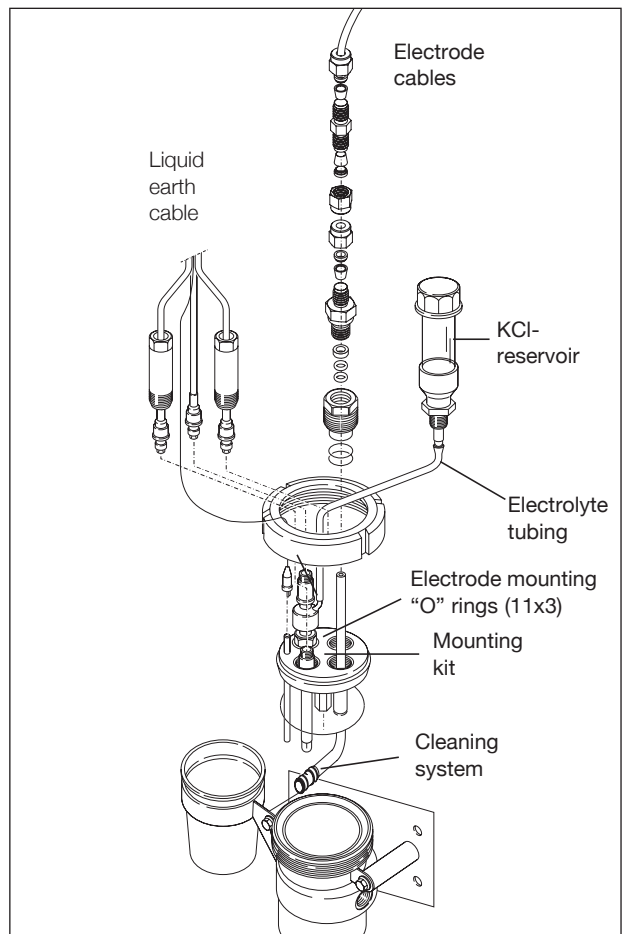


Fig. 3. Assembled flow fitting (example)

Selection Criteria

Chemical		Concentration and pH		Material			
		W/V (%)	pH (25°C)	PVC	PVDF	PP	SS 316
Inorganic acid	Sulfuric acid	0.5	1.0	O	O	O	X
		0.05	2.0	O	O	O	X
	Hydrochloric acid	0.4	1.0	O	O	O	X
		0.04	2.0	O	O	O	X
	Nitric acid	0.6	1.0	O	O	O	O
		0.06	2.0	O	O	O	O
	Phosphoric acid	1.0	1.5	O	O	O	O
	Boric acid	0.6	5.0	*	O	O	*
	Carbonic acid	0.6	3.6	O	O	O	*
Organic acid	Chromic acid	1.2	0.8	O	O	O	O
	Sulfurous acid	0.8	1.4	O	O	O	*
	Acetic acid	0.6	2.8	*	O	O	*
	Formic acid	0.5	2.3	*	O	O	O
	Oxalic acid	0.9	1.0	*	O	*	*
	Lactic acid	0.9	2.4	*	X	O	O
	Phenol acid	0.9	5.4	*	O	*	O
	Monochloroacetic acid	0.9	1.8	X	O	O	O
	Alkali	Calcium hydroxide	0.2	12.4	O	O	O
Potassium hydroxide		0.5	12.7	O	O	O	*
Sodium hydroxide		0.4	12.9	O	O	O	O
Ammonium hydroxide		0.5	10.4	O	O	O	O
Acid salt	Ammonium chloride	5		O	O	O	X
	Aluminous water	5		O	O	O	*
	Zinc chloride	5		O	O	O	X
	Iron (III) chloride	5		O	O	O	X
	Iron (III) nitrate	5	1.3	O	O	O	O
Basic salt	Sodium sulfite	5		O	O	O	*
	Sodium carbonate	5	11.8	O	O	O	O
	Sodium phosphate	5		O	O	O	*
Neutral salt	Potassium chloride	5		O	O	O	X
	Sodium sulfate	5		O	O	O	*
	Calcium chloride	5		O	O	O	X
	Sodium nitrate	5	8.2	O	O	O	*
	Aluminium chloride	5		O	O	O	X
Oxidizing agent	Hydrogen peroxide	1		O	O	O	*
	Sodium hypochlorite solution	1	12.5	O	O	*	X
	Chlorinated lime	1		*	O	O	*
	Potassium dichromate	5	4.5	O	O	O	*
Organic solvent	Alcohol	10		O	O	O	O
	Organic solvent or oil (excluding alcohol)			*	O	*	O
	Chlorinated solvent			X	O	X	*

O = can be used
 * = shortens useful life
 X = cannot be used

Note:

- pH in table was calculated with dissociated constant (related to measurement)
- When any of the two conditions listed below are applicable, please consult our sales department.
 - Strong, oxidizing solutions such as aqua regia, chromic acid, hypochloric acid, perchloric acid, etc.
 - The organic solvent is contained in the order of a few percent.

Model and Suffix codes

Model code	Suffix Code	Option code	Description
WU10			Sensor cable
Connector type	-V		Variopin
Cable type		-S	Single Coax
Cable length		-02	2 meters
		-05	5 meters
		-10	10 meters
		-15	15 meters
		-20	20 meters

Accessories

Part no.	Description
K1500FU	KCl reservoir PVC for F*20
SB20	Salt bridge
K1500BX	Grommet for watertight cable input in PG 16 gland (3 electrodes cables and liquid earth cable)
K1500BY	Mounting kit for (top) refillable electrodes
K1547PA	Complete hastelloy cleaning system /HCN2 and /HCN3
K1547PB	Complete hastelloy cleaning system /HCN4
K1521AD	Flange adapter /FS3
K1521AE	Flange adapter /FF3
K1521AF	Flange adapter /FP3
K1521AG	Flange adapter /FS4
K1521AH	Flange adapter /FF4
K1521AJ	Flange adapter /FP4
K1521AK	Flange adapter /FS1
K1521AL	Flange adapter /FF1
K1521AM	Flange adapter /FP1
K1521AN	Flange adapter /FS2
K1521AP	Flange adapter /FF2
K1521AQ	Flange adapter /FP2

Cables

Part no.	Description
K1500FV	Liquid earth cable (10 m)
K1500DU	Liquid earth cable (25 m)
WU20-PC02	COAX-cable (2 m) for single electrode
WU20-PC05	COAX-cable (5.5 m) for single electrode
WU20-PC10	COAX-cable (10 m) for single electrode
WU20-PC15	COAX-cable (15 m) for single electrode
WU20-PC20	COAX-cable (20 m) for single electrode
WU20-PC25	COAX-cable (25 m) for single electrode
WU20-LT02	TRIAX-cable (2 m) for combined electrode
WU20-LT05	TRIAX-cable (5.5 m) for combined electrode
WU20-LT10	TRIAX-cable (10 m) for combined electrode
WU20-LT15	TRIAX-cable (15 m) for combined electrode
WU20-LT20	TRIAX-cable (20 m) for combined electrode
WU20-LT25	TRIAX-cable (25 m) for combined electrode

Consumable Parts

Part no.	Description
K1500GF	250 ml. KCl-solution (1 M)
K1500GG	250 ml. KCl-solution (1 M), thickened
K1520BA	Starters kit containing the NIST buffers with pH of 4.01; 6.86 and 9.18 pH: The default buffers in all our pH analyzers (PH71, PH72, PH402, PH202, PH450, etc): so Plug and play
K1520BB	Three bottles with NIST buffer 2.68 pH (replacing 6C231)
K1520BC	Three bottles with NIST buffer 4.01 pH (replacing 6C232 and K94...)
K1520BD	Three bottles with NIST buffer 6.86 pH (replacing 6C237 and K94...)
K1520BE	Three bottles with NIST buffer 9.18 pH (replacing 6C234 and K94...)
K1520VA	250 ml. KCl-solution (3.3 M)
K1520VN	250 ml. KCl-solution (3.3 M), thickened

Spare parts FP20

Part no.	Description
K1500GR	O-rings silicon 11x3 8pcs
K1500GS	O-rings set for FP20-S14
K1500HC	Rings set, rubber for FP20-S13(D)
K1500HD	O-rings silicon 11x3 50pcs

GS 12B06K01-01E-E

Spare parts FF20 / FS20

Part no.	Description
K1500BV	O-rings EPDM 11x3 (6 Pcs.)
K1500BW	Flow tube for SB20-VC
K1500BY	Option /R for F*20.. (82850747)
K1500BZ	O-rings Viton 11x3 (6Pcs)51250
K1500DU	Liquid earth cable 25m
K1500DW	Set of 12 cable nuts for WU20
K1500DX	5 m tubing for SB20
K1500DZ	Nut SS, FF/S20-3* + ISC40FF/S
K1500EK	O-rings viton 6.07x1.78 (5x2)
K1500EQ	O-ring set EPDM FF20-S22
K1500ER	O-ring set Viton FF20-S22
K1500ES	O-ring set EPDM FF20-P&F33/3B
K1500ET	O-ring set Viton FF20-P&F33/3B
K1500EU	O-ring set EPDM FF20-S33/S3B
K1500EV	O-ring set Viton FF20-S33/S3B
K1500EW	O-ring set EPDM FF20-P&F43/4B
K1500EX	O-ring set Viton FF20-P&F43/4B
K1500EY	O-ring set EPDM FF20-S43/S4B
K1500EZ	O-ring set Viton FF20-S43/S4B
K1500FK	O-ring set Viton FF20P&F22
K1500FL	O-ring set standard FF20P&F22
K1500FM	O-ring set FF20-S22
K1500FU	KCl reservoir PVC for F*20
K1500FV	Liquid earth cable 10m
K1500GA	5 m tube for KCl reservoir
K1500GN	O-ring set silicon FF/FS20 3-hole/3B SS
K1500GP	O-ring set std FF/FS20 3-hole/3B P/F
K1500GR	O-rings silicon 11x3 8pcs
K1500GT	O-ring set silicon. FF20-.4.
K1500GZ	Earthpin assy for F*20 non-S
K1500HA	Calibr. dish for FF20-*33 (50)
K1500HB	Calibr. dish for FF20-*43 (50)
K1500HD	O-rings silicon 11x3 50pcs
K1511DP	O-rings viton 21.9x2.62 (5x2) PH20
K1520CE	Spare 3-hole holder PP
K1520CF	Spare 3-hole holder PVDF
K1521AD	Flange adapter /FS3
K1521AE	Flange adapter /FF3
K1521AF	Flange adapter /FP3
K1521AG	Flange adapter /FS4
K1521AH	Flange adapter /FF4
K1521AJ	Flange adapter /FP4
K1521AK	Flange adapter /FS1
K1521AL	Flange adapter /FF1
K1521AM	Flange adapter /FP1
K1521AN	Flange adapter /FS2
K1521AP	Flange adapter /FF2
K1521AQ	Flange adapter /FP2
K1521JA	Holder for FU24(F) in FF20-S3* (SS)
K1521JB	Holder for FU24(F) in FF20-F3* (PVDF)
K1521JD	Holder for FU20(F) in FF20-S3* (SS)
K1521JE	Holder for FU20(F) in FF20-F3* (PVDF)
K1521JF	Holder for FU20(F) in FF20-P3* (PP)
K1547PA	Hast. cleaning unit HCN2/3
K1547PB	Hast. cleaning unit HCN4
K1547PF	Nozzle and mounting HCN2/3/F
K1547PG	Nozzle and mounting HCN4
K1547PH	10 m Nylon Tube and mounting
K1547PP	Spare Part EPDM spraying valves

O-ring selection FS20

Spare part	Size	Quantity	Material	Description GS
K1500GR	11X3	8	silicone	O-rings silicon for electrode mounting
K1500HD	11X3	50	silicone	O-rings silicon for electrode mounting
K1500GT	4.5X1.8	1	Viton	O-ring set silicon FF20-.4
	85X5	1	silicone	O-ring set silicon FF20-.4
	11X3	8	silicone	O-ring set silicon FF20-.4
K1500BV	11X3	6	EPDM	O-rings EPDM
K1500EK	6.1X1.8	5X2	Viton	O-rings viton
K1500BZ	11X3	6	Viton	O-ring Viton
K1500ER	21.9X2.6	2	Viton	O-ring set Viton FF20-S22
	54X5	1	Viton	O-ring set Viton FF20-S22
K1511DP	21.9X2.6	5X2	Viton	O-rings Viton
K1500GN	53X5	1	silicone	O-ring set FF/FS20 3-hole SS
	11X3	6	silicone	O-ring set FF/FS20 3-hole SS
K1500GP	4.5X1.8	1	Viton	O-ring set FF/FS20 3-hole P/F
	56.5X5.3	1	silicone	O-ring set FF/FS20 3-hole P/F
	11X3	6	silicone	O-ring set FF/FS20 3-hole P/F

O-ring selection FF20

Spare part	Size	Quantity	Material	Description GS
K1500GR	11X3	8	silicone	O-rings silicon for electrode mounting
K1500HD	11X3	50	silicone	O-rings silicon for electrode mounting
K1500FX	29.7X3.5	5	silicone	silicone O-rings for mounting sensor in fitting and subassembly
K1500FY	37.8X2.6	5	silicone	O-rings for mounting the sensor in the fitting
K1500GT	4.5X1.8	1	Viton	O-ring set silicon FF20-.4
	85X5	1	silicone	O-ring set silicon FF20-.4
	11X3	8	silicone	O-ring set silicon FF20-.4
K1500BV	11X3	6	EPDM	O-rings EPDM
K1500EQ	21.9X2.6	2	EPDM	O-ring set EPDM FF20-S22
	53X5	1	EPDM	O-ring set EPDM FF20-S22
K1500EU	53X5	1	EPDM	O-ring set EPDM FF20-S33
	11X3	6	EPDM	O-ring set EPDM FF20-S33
K1500EY	85X5	1	EPDM	O-ring set EPDM FF20-S43
	11X3	8	EPDM	O-ring set EPDM FF20-S43
K1500ES	4.5X1.8	1	EPDM	O-ring set EPDM FF20P&F33
	56.5X5.3	1	EPDM	O-ring set EPDM FF20P&F33
	11X3	6	EPDM	O-ring set EPDM FF20P&F33
K1500EW	4.5X1.8	1	EPDM	O-ring set EPDM FF20P&F43
	85X5	1	EPDM	O-ring set EPDM FF20P&F43
	11X3	8	EPDM	O-ring set EPDM FF20P&F43
K1500FJ	21.9X2.6	2	EPDM	O-ring set EPDM FF20P&F22
	56.5X5.3	1	EPDM	O-ring set EPDM FF20P&F22
K1500BZ	11X3	6	Viton	O-rings Viton
K1500EK	6.1X1.8	5X2	Viton	O-rings viton
K1500ER	21.9X2.62	2	Viton	O-ring set Viton FF20-S22
	54X5	1	Viton	O-ring set Viton FF20-S22
K1500ET	4.5X1.8	1	Viton	O-ring set Viton FF20P & F33
	56.5X5.3	1	Viton	O-ring set Viton FF20P & F33
	11X3	6	Viton	O-ring set Viton FF20P & F33
K1500EV	54X5	1	Viton	O-ring set Viton FF20-S33
	11X3	6	Viton	O-ring set Viton FF20-S33
K1500EX	4.5X1.8	1	Viton	O-ring set Viton FF20P & F43
	85X5	1	Viton	O-ring set Viton FF20P & F43
	11X3	8	Viton	O-ring set Viton FF20P & F43
K1500EZ	85X5	1	Viton	O-ring set Viton FF20-S43
	11X3	8	Viton	O-ring set Viton FF20-S43
K1500FK	21.9X2.6	2	Viton	O-ring set Viton FF20P & F22
	56.5X5.3	1	Viton	O-ring set Viton FF20P & F22
K1511DP	21.9X2.6	5X2	Viton	O-rings Viton
K1500FL	21.9X2.6	2	Viton	O-ring set standard FF20P & F22
	56.5X5.3	1	silicone	O-ring set standard FF20P & F22
K1500FM	21.9X2.6	2	Viton	O-ring set FF20-S22
	53X5	1	silicone	O-ring set FF20-S22
K1500GN	53X5	1	silicone	O-ring set FF/FS20 3-hole SS
	11X3	6	silicone	O-ring set FF/FS20 3-hole SS
K1500GP	4.5X1.8	1	Viton	O-ring set FF/FS20 3-hole P/F
	56.5X5.3	1	silicone	O-ring set FF/FS20 3-hole P/F
	11X3	6	silicone	O-ring set FF/FS20 3-hole P/F
K1500DD	53.34x5.33	1	Kalrez	O-ring Kalrez for FF20-S33

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