

General Specifications

Model EXA Series
Compact pH Probes
PF20, PD20 and PS20

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 electrode, integrated liquid earth with temperature sensor, a spray unit for chemical cleaning (optional) and one combination cable.

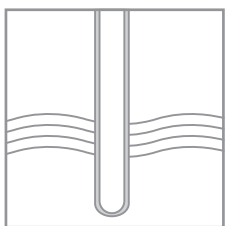
The EXA Compact system is perfectly suited for the advanced capabilities of the EXA PH analyzers, e.g.: sensor diagnostics and automatic chemical cleaning, resulting in a reliable pH-loop with outstanding performance.

Features

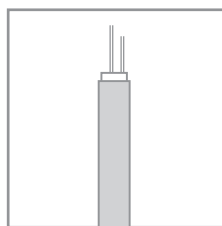
- Available for flow-, insertion- and immersion mounting.
- Integrated liquid earth for sensor diagnostics with the EXA PH-series.
- Suitable for measurement with double sided high impedance input circuits.
- Integrated spray unit for chemical cleaning available as option.
- Integrated temperature sensor (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 various process connections.
- Easy handling by small size, light weight and fast-fit parts.
- All-in-one system eases stock and order processing.
- Non-flow combination electrode with PTFE-diaphragm.
- Wetted parts from ryton, PVC-C and stainless steel (or hastelloy) for excellent chemical resistance.
- Flow electrode suitable for severe fouling and poisoning applications.



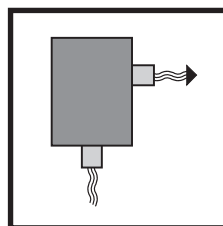
System configuration



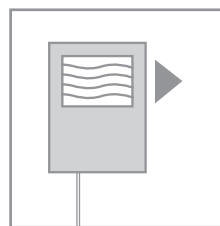
Sensors



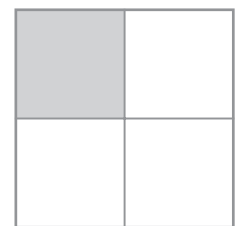
Cables



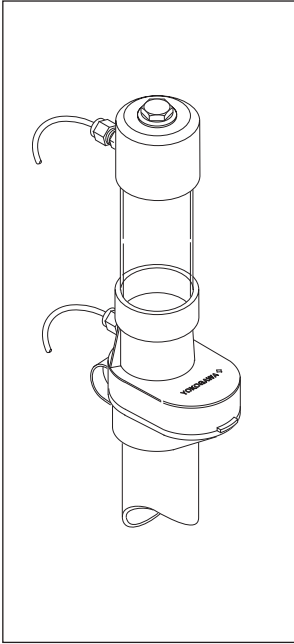
Fittings



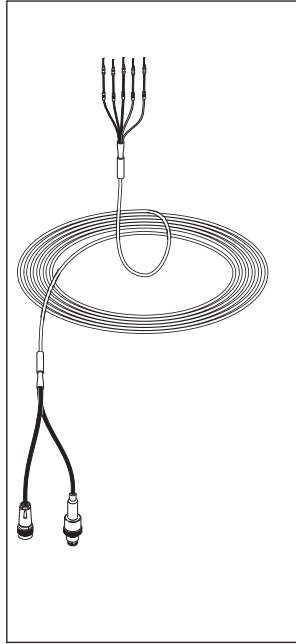
Transmitters



Accessories



Electrolyte reservoir with protection cap



Combination cable

The EXA Compact Probe System

Reference liquid (KCl) reservoir (optional):

The reference liquid reservoir is used to supply electrolyte (KCl) to the flow electrode when used. This gives a constant out-flow of electrolyte into the process preventing penetration of process liquid into the electrode. This protects the reference electrode against risk of poisoning. For this purpose the reservoir can also be pressurized up to 5 bar.

The reservoir with electrolyte saves maintenance costs and, because of its transparency, the electrolyte level is shown all the time. Mounting and de-mounting on the protective cap is very simple so the standard system can retrospectively be upgraded to a flow version if necessary.

Protection hood with cap:

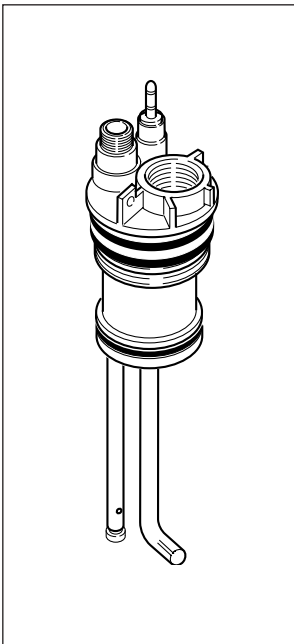
The protection hood with cap protects the electrode head and electrical connections of the basic holder against rain, dust and mechanical damage. It can be withdrawn easily from the basic holder to give fast access to the electrode and connections. The cap also retains the cable and tubes for electrolyte and chemical cleaning agent. Unlocking is easy by opening the cap.

Combination cable:

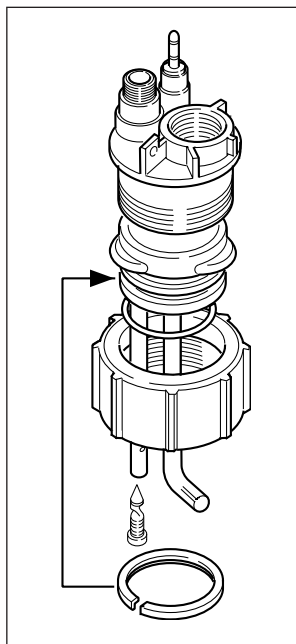
The combination cable is a factory finished multi-core coax cable with simple connectors for the electrode and liquid earth with integrated temperature sensor and a 5-lead connection to the converter. This allows a quick and simple installation on site.

Basic holder:

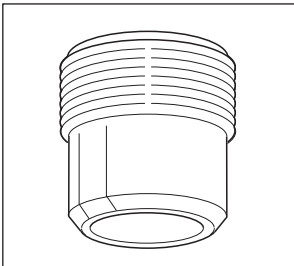
This is the central unit of the system upon which the electrode and all other parts are mounted. It includes the liquid earth pin which gives a stable measurement in combination with the high impedance input circuits of the pH converter. In the case of the EXA pH converter it also supports on line diagnostics of the sensor. The integral temperature sensor gives optimum accuracy over a wide range of process temperatures. With the optional spray unit a cleaning agent can be sprayed onto the pH electrode. In conjunction with EXA 4-wire instruments the dynamic response of the sensor is also checked. A unique twist-lock system ensures with easy handling a watertight connection



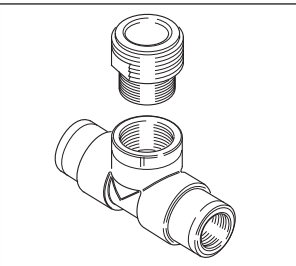
Basic holder (PD20)



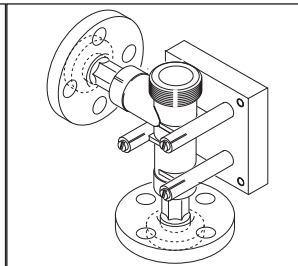
Basic holders (PF20, PS20)



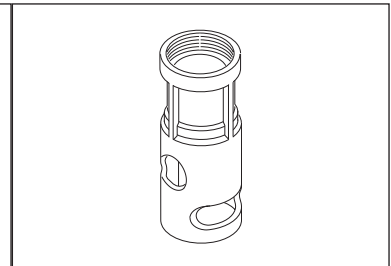
Welding sockets
The probe can be supplied with welding sockets for direct insertion into a pipe or tank.



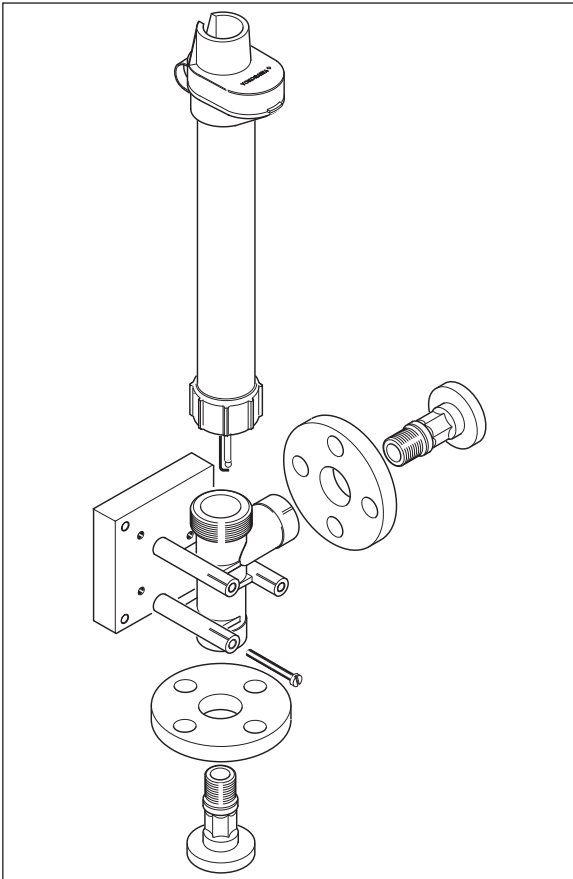
T-pieces
T-pieces are available for installation directly in line.



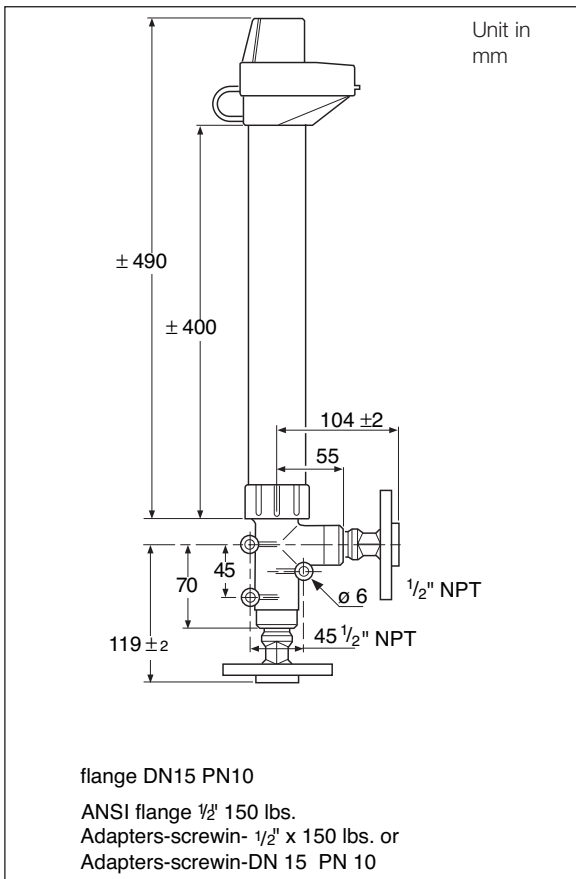
Flow vessel
The injection-moulded flow vessel is suitable for installation in a sample line. Flange connection for DIN or ANSI are available.



Protection cage
The immersion probe is suitable for installation in open/closed tanks using a gas-tight flange or clamps for wall mounting. The protection cage shields the electrode from mechanical damage.



Flow type



The EXA Compact Flow Probe Model PF20

The EXA Compact flow system is ideal for installation in a by-pass circulation pipe line of a tank or fast sample loop from a large volume flow line. It has a very small dead volume giving immediate response to changes. A by-pass measurement has the advantage of easy isolation from the main stream for maintenance.

The flow fitting can be located at a convenient place and level with small diameter pipe-line connecting to the vessel.

The basic holder with electrode can be quickly taken off for inspection or calibration with the large fixing nut without twisting the cable.

The flow vessel has 1/2" NPT female connections. In addition to that flange adapters are available for DN 15 DIN flanges or 1/2" ANSI flanges. The inlet at the bottom gives an angled flow with the outlet on the horizontal level. When the outlet runs down the tip of the electrodes will stay wetted with the sample.

The flow vessel can be surface mounted by three long bolts (M5) or by an optional wall mounting plate.

Specifications:

Wetted parts

Holder	: Glas-fitted PPS (RYTON)
Earth pin	: Stainless steel 316L or Hastelloy C276
O-ring	: Viton/NBR
Spray unit (optional)	: Stainless steel 316L or Hastelloy C276

General

Cap	: EPDM rubber
Protection hood	: Polypropylene

Process conditions

Temperature limits	: 0-70°C
Pressure limits	: 0-2 bar (0-200 kPa)
Flow rate max.	: 3 l/m

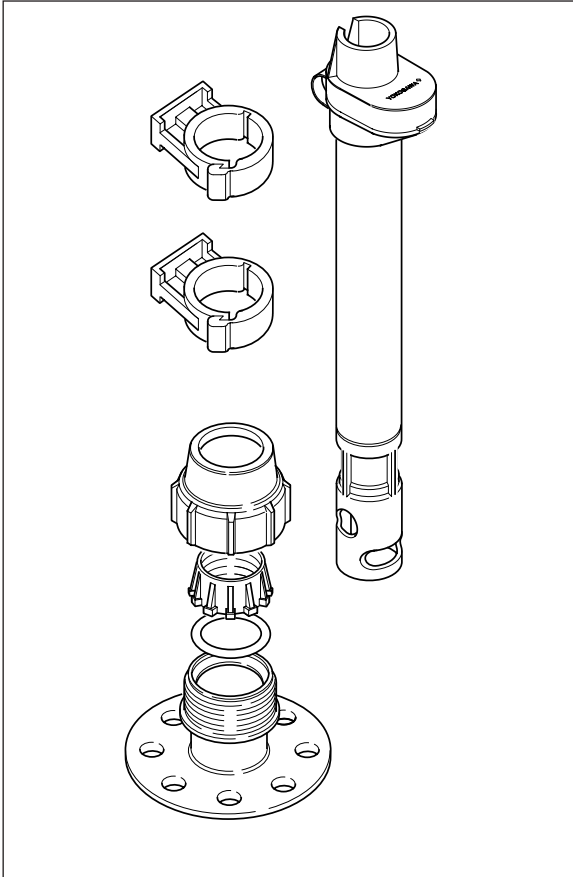
Model code

Model	Suffix	Option	Description
PF20			Flow pH probe with flow vessel and electrode holder in Ryton and 1/2" NPT process connection
Liquid	-RS		Liquid earth in stainless steel 316L (not with Hastelloy)
Earth	-RH		Liquid earth in Hastelloy C276 (not in combination with -CS)
Chemical cleaning	-CS		Chemical cleaning in stainless steel 316L
	-CH		Chemical cleaning in Hastelloy C276
Length of cable/cleaning	-05		5 mtr.
	-10		10 mtr.
Temperature compensation	-T1		Pt1000
	-T2		Pt100
Style code	*A		Style A
Options (process connections)	/WM		Wall mounting plate (use recommended with options /FC and /FD)
	/FC		2x DN15 PN10 Flanges in reinforced polyester
	/FD		2x 1/2 ANSI (Class 150) flanges in reinforced polyester
	/M		Material certificate 3.1 according to EN 10024 for wetted metal parts only
	/KR		Flow reservoir

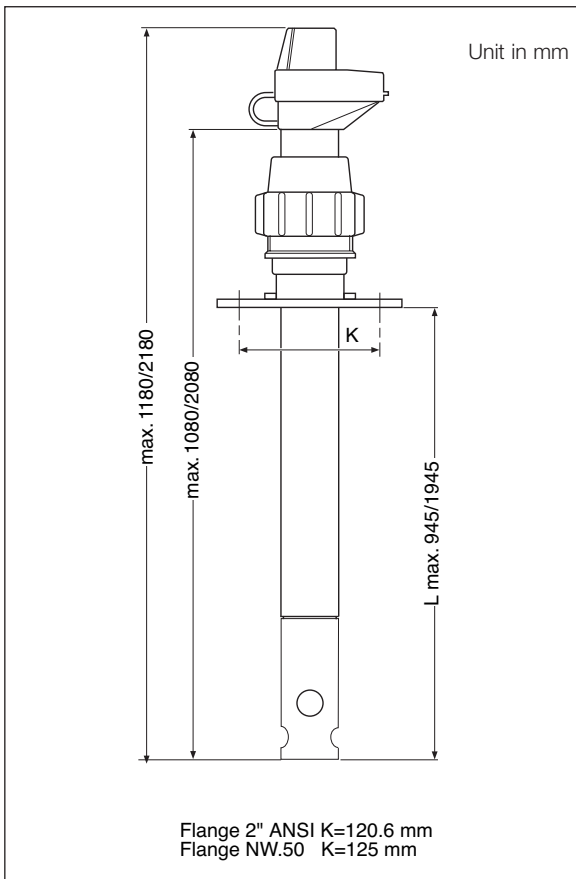
Note:

Suitable sensors: Non-flow electrode SC21C-AGP64 + SC21C-AGP26
Flow electrode (SC21C-AGC55)+ SC21C-AGP26

The SC21C-AGP64 (non flow) and the SC21C-AGC55 (flow) can be ordered separately. The electrodes will suit the great majority of the (waste) water applications. When a non-flow, heavy duty electrode is required one should order the SC21C-AGP26 which can withstand more severe conditions. Also for redox measurements, flow- and non-flow electrodes are available.



Immersion type



The EXA Compact Immersion Probe Model PD20

The EXA Compact immersion system is ideal for installation in open or closed tanks or channels. The light weight and small diameter make it easy to handle. For maintenance the basic holder with electrode comes off without tools or turning, leaving the cable untwisted. Standard lengths of 1 or 2 mtr. are available. When the rubber cap is removed from the top the pipe can be shortened if needed. Mounting with the optional gas-tight sliding flange is ideal for installation in a closed tank. The immersion depth can be varied by sliding the pipe through the flange.

The flange has both DIN DN50 and ANSI 2" fixing holes. Mounting in open vessels or channels is easy with the optional clamps for wall mounting. The immersion depth into the process can be adjusted by sliding the tube through the clamps.

Specifications:

Wetted parts

- Holder : Glas-fitted PPS (RYTON R4XT)
- Earth pin : Stainless steel 316L or Hastelloy C276
- O-ring : Viton
- Immersion tube : High temperature polyvinylchloride (PVC-C)
- Protection cage : Reinforced polypropylene
- Flange : Reinforced polypropylene

General

- Cap : EPDM rubber
- Protection hood : Polypropylene
- Wall mounting clamps : Polypropylene

Process

- Temperature limits : 0-70°C
- Pressure limits : 0-0.5 bar (50 kPa)
- Flow speed limits : 0.5 m/s

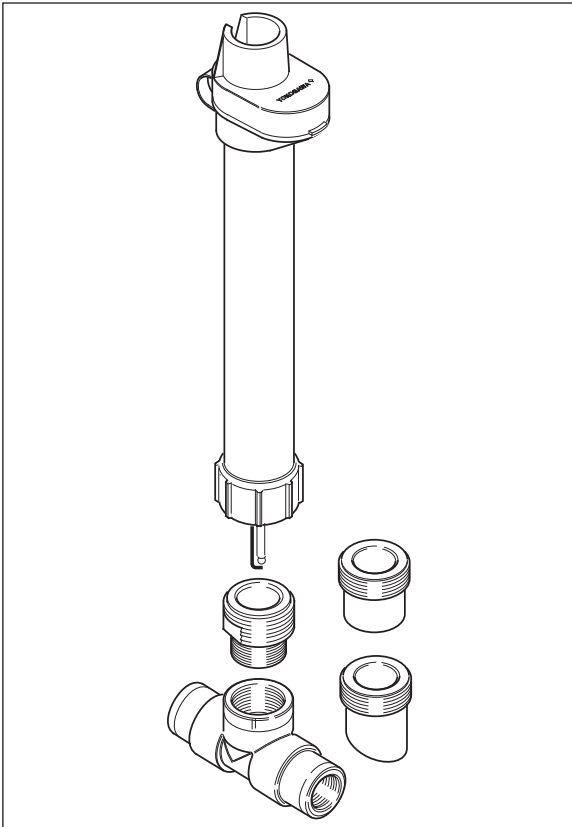
Model Code

Model	Suffix	Option	Description
PD20			Immersion pH probe with immersion tube in PVC-C and electrode holder in Ryton
Liquid	-RS		Liquid earth in stainless steel 316L (not with Hastelloy)
Earth	-RH		Liquid earth in Hastelloy C276 (not in combination with-CS)
Chemical cleaning	-CS		Chemical cleaning in stainless steel 316L
	-CH		Chemical cleaning in Hastelloy C276
Length of cable/cleaning	-05		5m
	-10		10m
Length insertion tube	1		1m (adjustable on site)
	2		2m (adjustable on site)
Temperature compensation	-T1		Pt1000
	-T2		Pt100
Style code	*A		Style A
Options (process connections)	/CW		2 clamps (PP) for wall mounting
	/FA		Flange (PP), DN50 (holes acc.to PN10) or 2" holes acc. to ANSI
	/KR		Flow reservoir
	/M		Material certificate 3.1 according to EN 10024 for wetted metal parts only

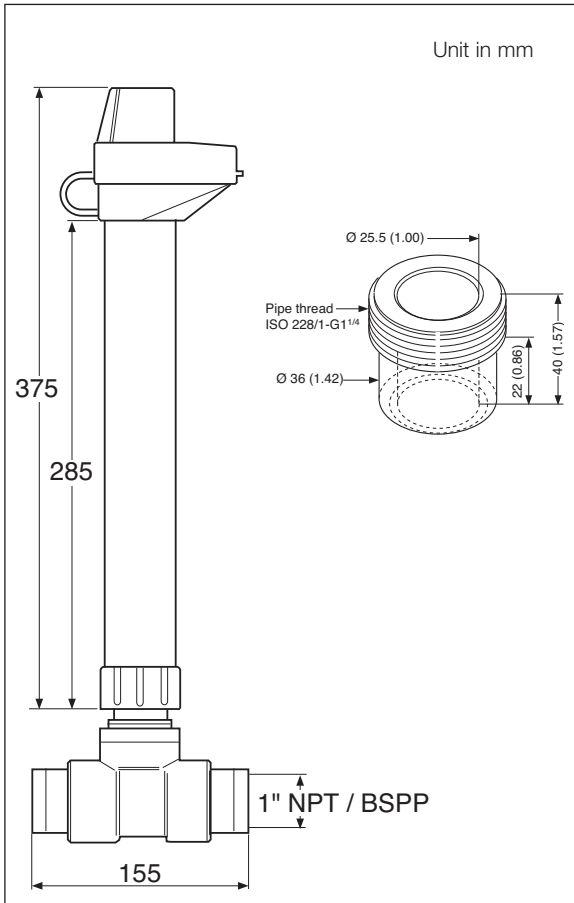
Note:

- Suitable sensors: Non-flow electrode (SC21C-AGP64)
- Flow electrode (SC21C-AGC55)

The SC21C-AGP64 (non flow) and the SC21C-AGC55 (flow) can be ordered separately. The electrodes will suit the great majority of the (waste) water applications. When a non-flow, heavy duty electrode is required one should order the SC21C-AGP26 which can withstand more severe conditions. Also for redox measurements, a flow- and a non-flow electrode are available.



Insertion type



Insertion type dimensions

The EXA Compact Direct Insertion Probe Model PS20

The EXA Compact direct insertion system is ideal for installation directly in a flow line or tank. With a choice of adapters the system can be used in a variety of applications.

The standard 1 1/4" BSP female connections can be mounted into the stainless steel weld-in sockets. These sockets are either welded from a vertical or angled position into the wall of the tank or into the pipe.

The minimal angle of mounting is 15° from the horizontal level. For mounting into a tapered stud we provide a polypropylene 1 1/4" BSPT male and stainless steel 1" NPT male adapter.

Further accessories include T-pieces in polypropylene (ISO 228/1-G1) and stainless steel (ISO 228/1-G1) for easy fitting into a piping system.

These wide bore systems have the advantage of keeping the electrode clean through the high flow velocity. The disadvantage is that for inspection or calibration the flow has to be stopped.

Specifications:

Wetted parts

Holder	: Glas-fitted PPS (RYTON)
Earth pin	: Stainless steel 316L or Hastelloy C276
O-ring	: Viton
Weld-in adapters	: Stainless steel 316
T-piece with adapter	: Stainless steel 316 or Polypropylene

General

Cap	: EPDM rubber
Protection hood	: Polypropylene

Process conditions

Temperature limits	: 0-70°C
Pressure limits	: 0-2 bar (0-200 kPa)
Flow rate max	: 20 l/min

Model Code

Model	Suffix	Option	Description
PS20			Direct insertion pH probe with electrode holder in Ryton and 1 1/4" BSPP female process connection
Liquid earth	-RS		Liquid earth in stainless steel 316L (not with Hastelloy)
	-RH		Liquid earth in Hastelloy C276 (not in combination with-CS)
Chemical cleaning	-CS		Chemical cleaning in stainless steel 316L
	-CH		Chemical cleaning in Hastelloy C276
Length of cable/cleaning	-05		5m
	-10		10m
Insertion length	0		Always 0
Temperature Compensation	-T1		Pt1000
	-T2		Pt100
Style code	*A		Style A
Options (process connections)	/NP		1 1/4" BSPT (male (PP))
	/NS		1" NPT male (SS 316)
	/WA		Angle welding (SS 316)
	/WS		Straight welding (SS 316)
	/TP		T-piece (PP); 2 x ISO 228/1-G1 female (incl. option /NP)
	/TS		T-piece (SS316); 2 x ISO 228/1-G1 female (incl. option /NS)
	/KR		Flow reservoir
	/M		Material certificate 3.1 according to EN 10024 for wetted metal parts only

Note: Suitable sensors: Non-flow electrode (SC21C-AGP64)
Flow electrode (SC21C-AGC55)

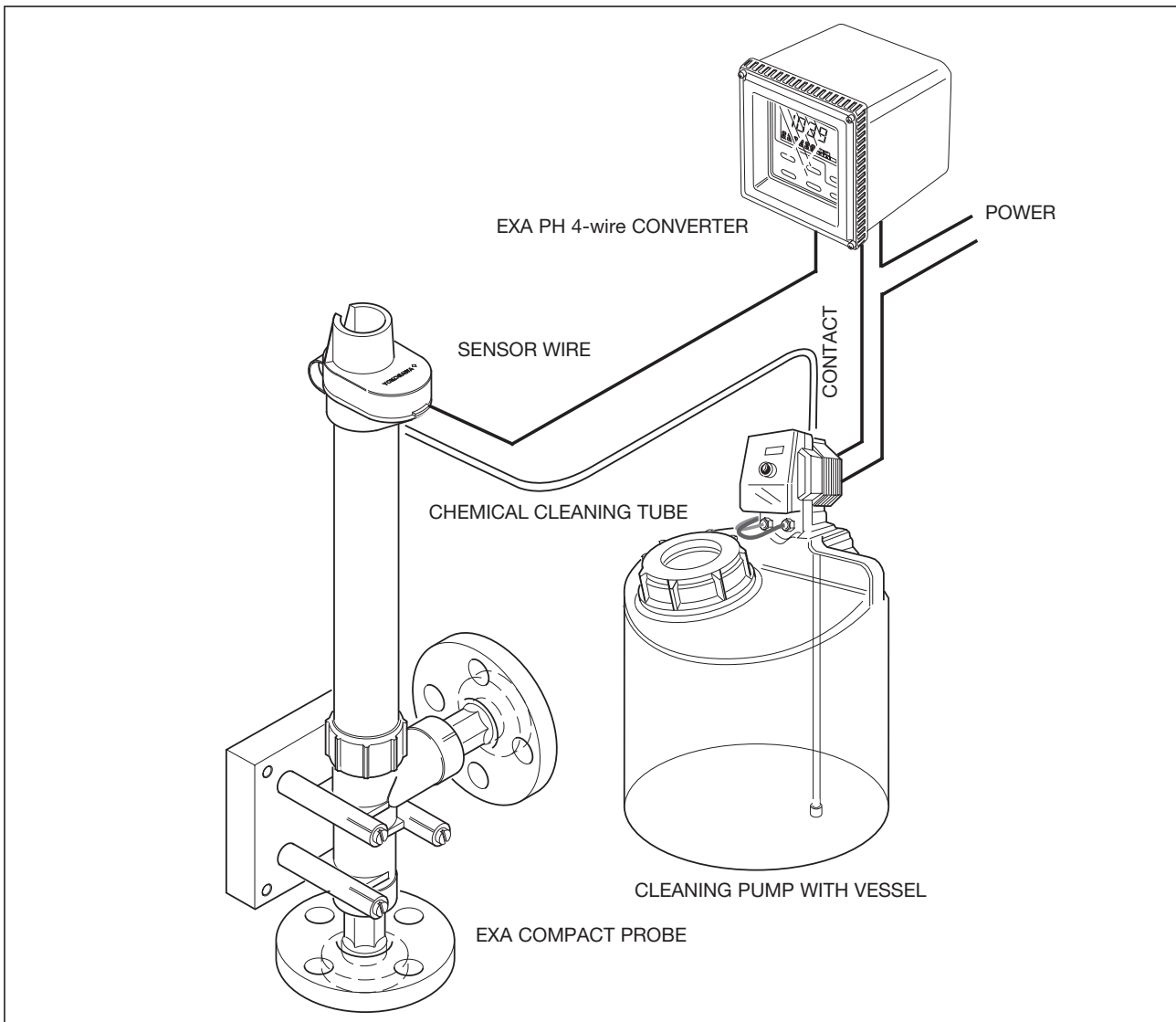
The SC21C-AGP64 (non flow) and the SC21C-AGC55 (flow) can be ordered separately. The electrodes will suit the great majority of the (waste) water applications. When a non-flow, heavy duty electrode is required one should order the SC21C-AGP26 which can withstand more severe conditions. Also for redox measurements, a flow- and a non-flow electrode are available.

Automatic Cleaning

The EXA Compact pH probe can be easily upgraded with an integrated spray unit for a chemical cleaning of the electrode, where there is a risk of fouling. This reduces the maintenance costs.

As can be seen from the configuration chart, the EXA Compact pH probe should be connected to a pump (or solenoid valve), spraying the cleaning agent from a reservoir onto the electrode. A pump pressure from 3 to 10 bar is needed to achieve an effective cleaning. The EXA PH402 and EXAxt PH450 converters with built-in washtimer can be used for controlling the automatic chemical cleaning cycle.

Depending of the cleaning agent used and the process conditions, the choice has to be made between a spray unit in stainless steel or Hastelloy (see model code). In a lot of processes, 3-5% HCl or hot water only is sufficient to achieve a chemical cleaning effect. By using a pump pressure of 10 bar also a chemical cleaning effect will be achieved. Please consult Yokogawa for more detailed information about the chemical cleaning of electrodes and delivery of the complete configuration.



Configuration with cleaning system

GS 12B6K4-E-E

Consumables and accessories

The SC21C-AGP64 (option /EN, non-flow) and the SC21C-AGC55 (option /EF, flow) can be ordered through the modelcode options. The electrodes will suit the great majority of the (waste) water applications. When a non-flow, heavy duty electrode is required one should order the SC21C-AGP26 which can withstand more severe conditions.

Also for redox measurements, a flow- and a non-flow electrode are available.

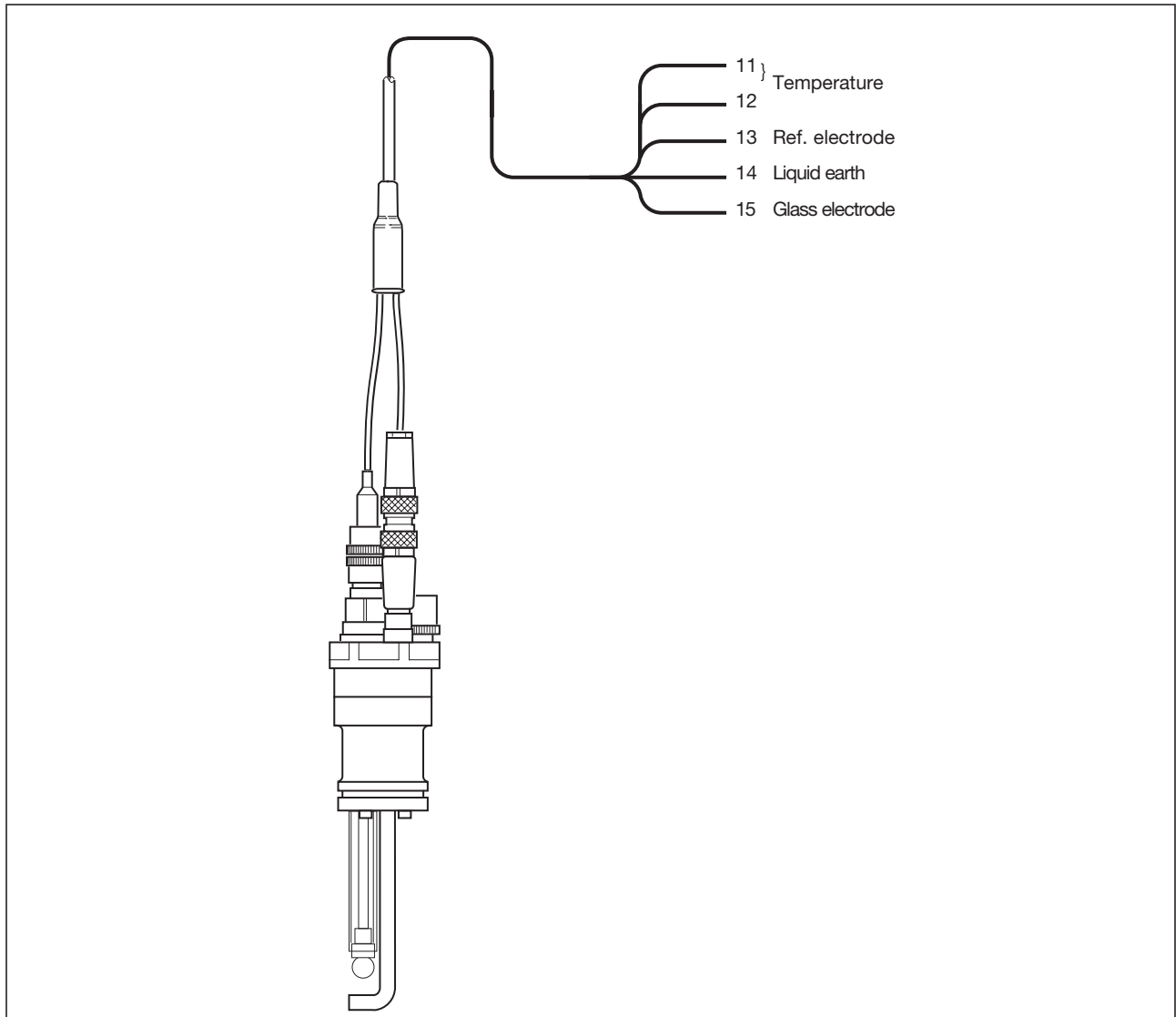
EXA Compact pH/redox electrode

Part No.	Description of electrode
SC21C-AGP64	Non-flow pH/ref electrode with PTFE diaphragm
SC21C-AGP26	Non-flow pH/ref electrode with double junction and heavy duty glass membrane
SC21C-AGC55	Flow pH/ref electrode with ceramic diaphragm
SC29C-PTP29	Non-flow platinum/ref electrode with double junction
SC29C-PTC55	Flow platinum/ref electrode

Note: For more information on the Compact electrode see GS 12B6J1-E-E

Options can be ordered separately:

PF20 (flow model)		
K1520GF	/WM	Wall mounting plate (use with part no. K1500YC or K1500YD)
K1500YC	/FC	2 x DN15 PN10 flanges in reinforced polyester
K1500YD	/FD	2 x 1/2" ANSI (class 150) flanges in reinforced polyester
K1520YN		cable, 5 mtr
K1520YP		cable, 10 mtr
PD20 (immersion model)		
K1500YA	/CW	Clamps (PP)
K1520EV	/FA	Flange (PP), DN50 (holes acc. to PN10) or 2" (holes acc. to ANSI)
PS20 (insertion model)		
K1520CZ	/NP	1 1/4" BSPT male (PP)
K1520DZ	/NS	1" NPT male (SS 316)
K1520EJ	/WS	Straight welding (SS 316)
K1520EK	/WA	Angle welding (SS 316)
K1520YE	/TP	T-piece (PP), 2 x ISO 228/1-G1 female (incl. K1520CZ)
K1520YF	/TS	T-piece (SS 316), 2 x ISO 228/1-G1 female (incl. K1520DZ)
K1520ZD		Ryton mounting nut for PS20



Wiring diagram

Spare parts PD20

Part No.	Description	Part No.	Description
K1500AJ	O-rings EPDM for /FA (2pcs)	K1520EA	Rubber cap for P*20
K1500BZ	O-rings Viton 11x3 (6Pcs)51250	K1520ET	Spraying valve for P*20
K1500DW	Set of 12 cable nuts for WU20	K1520FJ	Tubing set, chem. cleaning 5m
K1500ZF	Ferrule set, flow/cleaning tube	K1520FK	Tubing set, chem. cleaning 10m
K1520AR	Basic holder, P*20-RS-CS-T1	K1520JN	Adapter M25x1.5 - PG13.5
K1520AS	Basic holder, P*20-RS-CS-T2	K1520YA	/KR for PD/PF/PS20 holders
K1520AT	Basic holder, P*20-RH-CH-T1	K1520YN	PD/PF/PS20 cable, 5 m
K1520AU	Basic holder, P*20-RH-CH-T2	K1520YP	PD/PF/PS20 cable, 10 m
K1520DG	Protection cage for PD20	K1520ZA	O-rings viton 37.77x2.62 (2pcs)
K1520DS	Pipe, 2 m for PD20	K1520ZB	O-ring set viton, for PD20
K1520DU	Pipe, 1 m for PD20	K1547PH	10 m Nylon tube and mounting

Spare parts PF20

Part No.	Description	Part No.	Description
K1500AD	Screw set for PF20/WM (3pcs)	K1520DC	Flow chamber for PF20
K1500AE	O-ring set viton, PF/PS20 (5)	K1520DT	Protection tube for PF/PS20
K1500BZ	O-rings Viton 11x3 (6Pcs)51250	K1520EA	Rubber cap for P*20
K1500DW	Set of 12 cable nuts for WU20	K1520ET	Spraying valve for P*20
K1500ES	O-ring set EPDM FF20P&F33	K1520FJ	Tubing set, chem. cleaning 5m
K1500FK	O-ring set Viton FF20P&F22	K1520FK	Tubing set, chem. cleaning 10m
K1500ZF	Ferrule set, flow/cleaning tube	K1520JN	Adapter M25x1.5 - PG13.5
K1520AR	Basic holder, P*20-RS-CS-T1	K1520YA	/KR for PD/PF/PS20 holders
K1520AS	Basic holder, P*20-RS-CS-T2	K1520YN	PD/PF/PS20 cable, 5 m
K1520AT	Basic holder, P*20-RH-CH-T1	K1520YP	PD/PF/PS20 cable, 10 m
K1520AU	Basic holder, P*20-RH-CH-T2	K1520ZD	Mounting nut for PS20
		K1547PH	10 m Nylon tube and mounting

Spare parts PS20

Part No.	Description	Part No.	Description
K1500AE	O-ring set viton, PF/PS20 (5)	K1520EA	Rubber cap for P*20
K1500BZ	O-rings Viton 11x3 (6Pcs)51250	K1520ET	Spraying valve for P*20
K1500DW	Set of 12 cable nuts for WU20	K1520FJ	Tubing set, chem. cleaning 5m
K1500FK	O-ring set Viton FF20P&F22	K1520FK	Tubing set, chem. cleaning 10m
K1500ZF	Ferrule set, flow/cleaning tube	K1520JN	Adapter M25x1.5 - PG13.5
K1520AR	Basic holder, P*20-RS-CS-T1	K1520YA	/KR for PD/PF/PS20 holders
K1520AS	Basic holder, P*20-RS-CS-T2	K1520YN	PD/PF/PS20 cable, 5 m
K1520AT	Basic holder, P*20-RH-CH-T1	K1520YP	PD/PF/PS20 cable, 10 m
K1520AU	Basic holder, P*20-RH-CH-T2	K1520ZD	Mounting nut for PS20
K1520DT	Protection tube for PF/PS20	K1547PH	10 m Nylon tube and mounting

YOKOGAWA HEADQUARTERS

9-32, Nakacho 2-chome,
Musashinoshi
Tokyo 180
Japan
Tel. (81)-422-52-5535
Fax (81)-422-55-1202
www.yokogawa.com

YOKOGAWA EUROPE B.V.

Databankweg 20
3821 AL AMERSFOORT
The Netherlands
Tel. +31-33-4641 611
Fax +31-33-4641 610
www.yokogawa.com/eu

YOKOGAWA CORPORATION OF AMERICA

2 Dart Road
Newnan GA 30265
United States
Tel. (1)-770-253-7000
Fax (1)-770-251-2088
www.yokogawa.com/us

YOKOGAWA ELECTRIC ASIA Pte. Ltd.

5 Bedok South Road
Singapore 469270
Singapore
Tel. (65)-241-9933
Fax (65)-241-2606
www.yokogawa.com/sg

Yokogawa has an extensive sales and distribution network. Please refer to the European website (www.yokogawa.com/eu) to contact your nearest representative.



YOKOGAWA ◆

GS 12B6K4-E-E

Subject to change without notice
Copyright©

Printed in The Netherlands, 11-705 (A) I