

General Specifications

Cleaning Systems
Model FC20

pH/ORP

For industrial applications and particularly for automatic process measurements it is of the greatest importance that the sensitive part of a glass electrode and the flow diaphragm of a reference electrode are kept clean.

Often it is not practical to interrupt a process for cleaning the electrodes, an accurate indication is required over a long period, replacing the electrodes is difficult, etc. Then an automatic cleaning mechanism may be the solution.

Yokogawa manufactures two different cleaning systems for pH and/or ORP (Redox) measurements:

- Chemical cleaning.
- Mechanical cleaning.

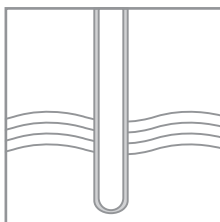
The cleaning elements have standardised dimensions for mounting in flow- and immersion fittings.

FEATURES

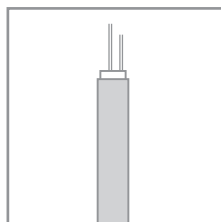
- Designed for in-line electrode cleaning in flow- and immersion fittings of Yokogawa.
- Restricts sediment formation on the electrodes and increases the period between cleaning.
- Optimum cleaning effect.
- Standardised dimensions for mounting in an electrode hole of a fitting.



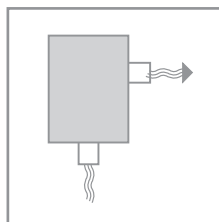
SYSTEM CONFIGURATION



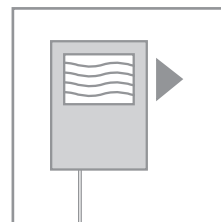
Sensors



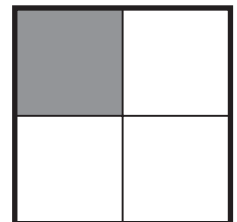
Cables



Fittings



Transmitters



Accessories

A. CHEMICAL CLEANING SYSTEM

The chemical cleaning system is effective in processes where deposits can be removed by a suitable solvent. Good cleaning effects can be obtained from periodically spraying of an electrode. EXA pH402 has a built-in wash timer with programmable wash time, interval time and relaxation time for automatic cleaning of the electrodes, preventing pollution of the pH sensitive parts. After washing, it is possible to check the response time of the electrodes.

A built-in (no return) nozzle in the spray unit prevents penetration of the process liquid in the cleaning system.

The standardised dimensions allow mounting in the (4-hole) flow and immersion fittings of Yokogawa.

FEATURES

- The EXA pH402 analyzer has a built-in timer and HOLD circuit.
- Built-in (no return) nozzle to prevent penetration of the process liquid into the cleaning system.

SPECIFICATIONS

SPRAY UNIT

Materials

Body	: Glass filled epoxy
Nozzle	: Polyvinylidene fluoride (PVDF)
Mounting gland	: Polyvinylidene fluoride (PVDF)
Fixing screw	: Polyvinylidene fluoride (PVDF)
O-rings	: Silicone rubber

Connection

: 1/4" OD tubing

Process conditions

: Max. 1 MPa (10 bar) at 100 °C

Weight

: Approx. 100 g

Mounting

: In flow- and immersion fittings (4-hole) of Yokogawa

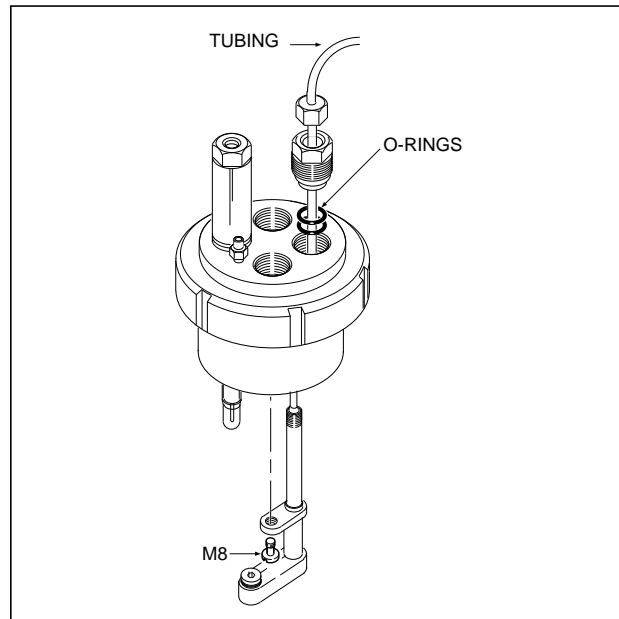


Fig. 1. Chemical cleaning system

B. BRUSH CLEANING SYSTEM

The brush in this cleaning system periodically strikes along the sensitive membrane of the measuring electrode, so that this part is wiped frequently, preventing sediment formation on it.

The flow of measuring solution is not obstructed and interruption of measurement during cleaning is not necessary.

The brush cleaning system is activated electrically or pneumatically.

The standardised dimensions allow mounting in the (4-hole) flow- and immersion fittings of Yokogawa.

FEATURES

- Minimum maintenance by static sealing of brush movement.
- Pneumatically or electrically driven.
- Easy replaceable brush.
- Brush height adjustable for optional cleaning effect.

SPECIFICATIONS

BRUSH HOLDER

Material

Body (see fig.)	: a. Stainless steel AISI 316
	: b. Epoxy
	: c. Silicone rubber
	: d. Epoxy resin

Brush : Horse hair (in PVDF holder)

Process conditions : Max. 1 MPa (10 bar) at 100 °C

Weight : Approx. 120 g

Mounting : In flow- and immersion fittings (4-hole) of Yokogawa

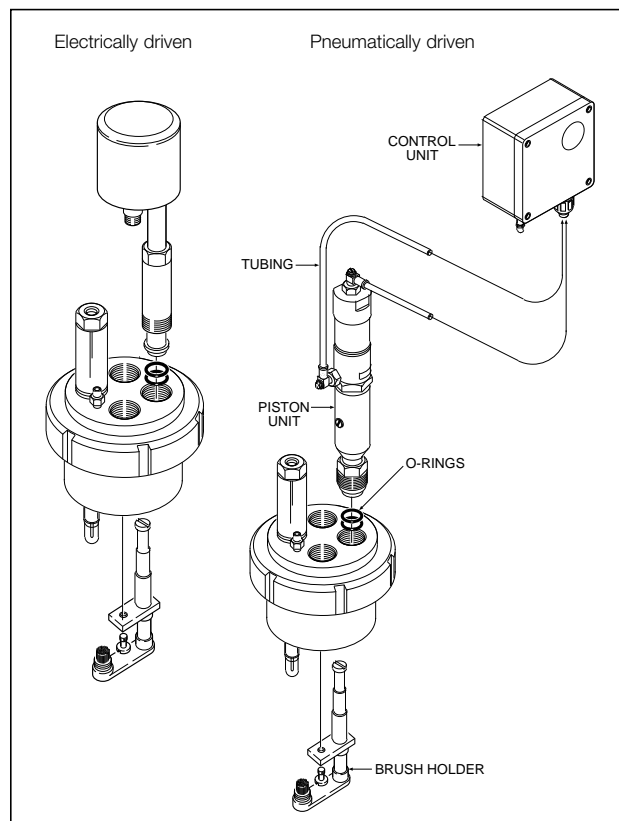


Fig. 2. Electrically/pneumatically driven brush cleaning

DRIVING MECHANISM (electrical)**Supply**

- Voltage : 24 V AC ($\pm 10\%$);
for 10 V/220V AC a power supply,
type BC10 is available
- Frequency : 50/60 Hz
- Consumption : Max. 4 VA

Cleaning frequency : 2 Strokes per minute

Angle : Rotation of 40° (swing)

Electrical connection : Gold plated spring O connector (for
standard cable, model WU20)
screw thread: $\frac{1}{4}$ " BSPP

Material

- Driving system : Stainless steel AISI 316
- Driving shaft : Stainless steel AISI 316
- Cap : Silicone rubber
- Connector : Polyvinylidene fluoride (PVDF)
- Mounting nut : Ryton R4

Weight : Approx. 1 kg

DRIVING MECHANISM (pneumatical)**1. Piston unit**

Air supply : Via the connected control unit

Cleaning frequency : $\frac{1}{4}$... 2 strokes per minute
(adjustable on the control unit)

Angle : Rotation 40°

Air connectors

(IN 1 and IN 2) : \varnothing 4 mm (external)

Material

- Body : Brass
- Mounting gland : Stainless steel AISI 316

Weight

: Approx. 1 kg

2. Control unit

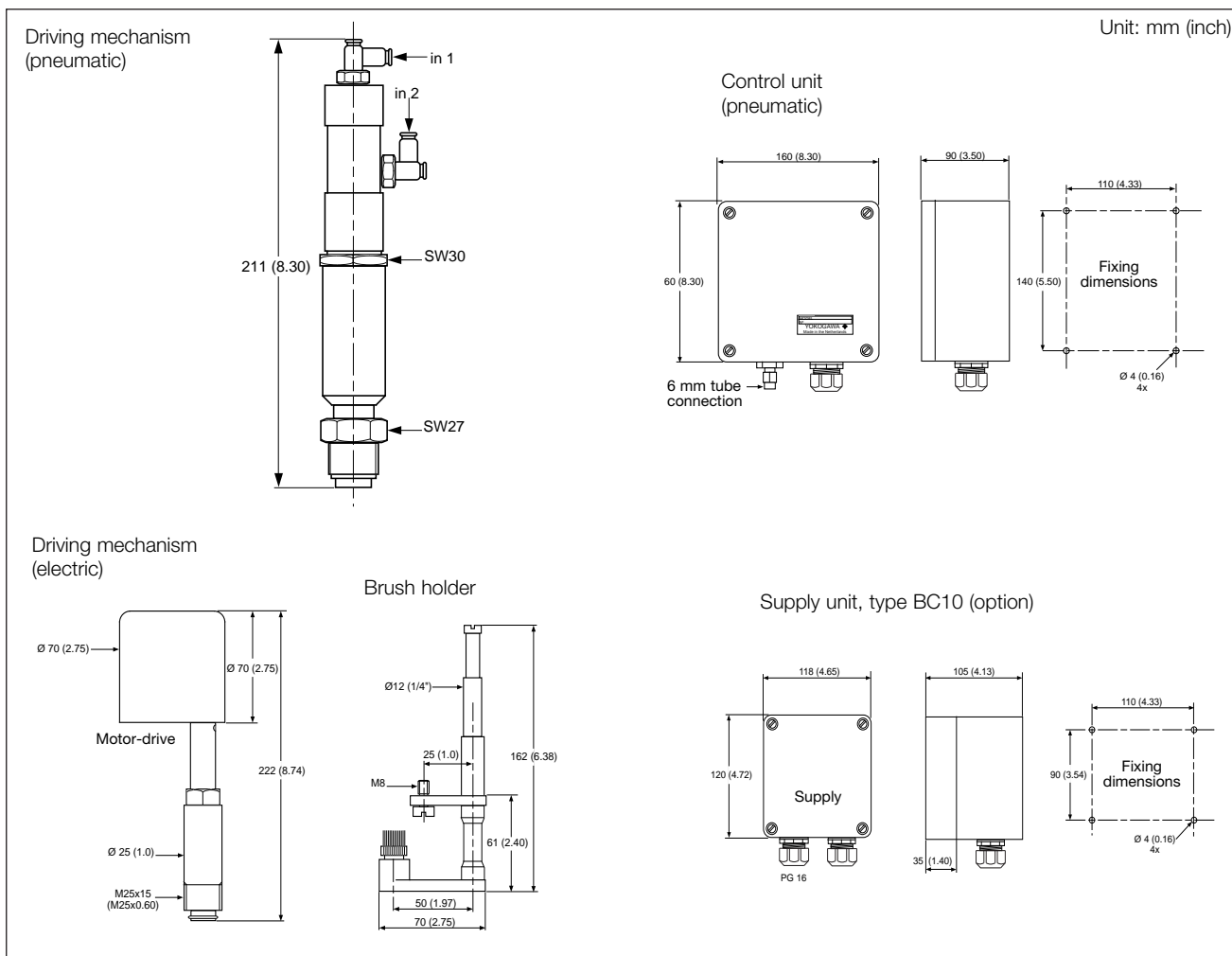
Air supply : 140 kPa (1.4 bar) pressurized air

Ambient temperature range

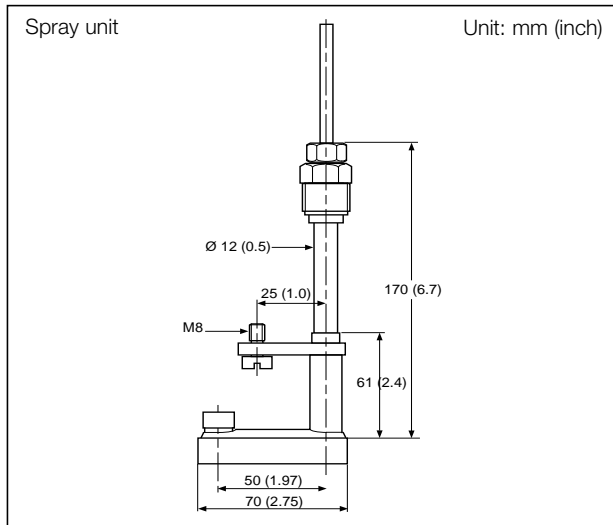
: -10 to + 60°C

Housing

- Material : Aluminium case with chemical
resistive lacquer IP65
- Entries : Air connector \varnothing 6 mm
- Dimensions : See dimensional drawings
- Mounting : Wall mounting (for fixing
dimensions see dimensional
drawings)
- Weight : Approx. 2.5 kg

DIMENSIONS Brush cleaning

DIMENSIONS Chemical cleaning



MODEL AND CODES

Model	Suffix code	Options code	Description
FC20	Cleaning system
Design	-VE	Brush cleaning (electrical driven)
	-VP	Brush cleaning (pneumatically driven)
	-ECN2	Chemical cleaning
Options		/T	10 m nylon tubing 6.35 mm OD (0.25) 1.27 mm thickness (0.05)
		/PH5.....	5 meter tubing
		/PH10....	10 meter tubing

SELECTION CRITERIA

Applications with:	Mechanical		Chemical	
	Brush	Acid	Base	Emulsifier
Oils, fats				X
Resins (wood, pulp)			X	
Emulsions of latex	X			
Fibers (paper, textile)	X			
Crystalline precipitations (carbonates)	X	XX		
Amorphous precipitations (hydroxides)	X	XX		

ACCESSORIES AND OPTIONS

Type	Description
WU20-PC02	COAX-cable (2 m) for FC20-VE
WU20-PC05	COAX-cable (5,5 m) for FC20-VE
WU20-PC10	COAX-cable (10 m) for and FC20-VE
BC 10	Supply unit (220/24 V AC) for motor of FC20-VE

SERVICE PARTS

Type	Description
K1520 NA	Tubing (ø 4 mm) Brush cleaning (pneumatically driven)
82895279	O-ring (11 x 3) for mounting in electrode holes (8 pieces)
FP20-R12	Mounting set (Ryton R4) for mounting in electrode holes
K1520 NB	Brush for mechanical cleaning
K1520 NF	Motor unit for electrically driven brush cleaning
K1520 NG	Brush holder for mechanical cleaning
K1520 NH	Piston for pneumatically driven brush cleaning
K1520 NJ	Control unit for pneumatically driven brush cleaning
K1520 FK	Tubing ø 1/4" chemical cleaning 10 m, tubing suitable for the wash noggle
K1500 ZF	Mounting set tubing 1/4"
K1520 ND	Transducer for ultra-sonic cleaning
K1520 NE	Generator for ultra-sonic cleaning

ORDERING INSTRUCTIONS

When ordering, specify model and code, item name and part numbers:

- Cleaning system : FC20-VE, FC20-VP or FC20-ECN2
- Accessories : Type number and description (quantity)
- Service parts : Type number and description (quantity)
- Flow fittings (4-hole): FF20-P43, FF20-S43 or FF20-F43
- Immersion fitting (4-hole)
: FD20-P47, FF20-S47 or FF20-F47
(refer to separate sheets)
- Subassembly flow fitting (4-hole)
: FS20-V42 or FS20-S42

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ISO 9001



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