

# General Specifications

## Model SC4A and PR4A Conductivity Sensors and Fittings for 2-electrode Systems

SC

### INSERTION SENSORS

Stainless steel or Titanium 2-electrode sensors with cell constants of  $0.02\text{ cm}^{-1}$ ,  $0.10\text{ cm}^{-1}$ , and fixed cables 3 to 20 meters in length.

Intended for the low conductivity applications found in the semiconductor, power, water and pharmaceutical industries, these sensors are designed in a convenient compact style. There are several mounting possibilities, including a compression gland, giving a simple effective method of direct insertion in process pipework. The sensors are made from a combination of wetted materials approved by FDA. This makes them ideally suited for the monitoring of pure water systems used in the preparation of injectable solutions. For this kind of application, sanitary clamp mountings are most often used. As with all Yokogawa conductivity sensors, the cell constants are individually calibrated in our laboratories to 4 significant figures using an ASTM method traceable to NIST international standards.

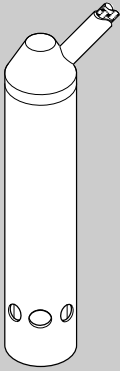
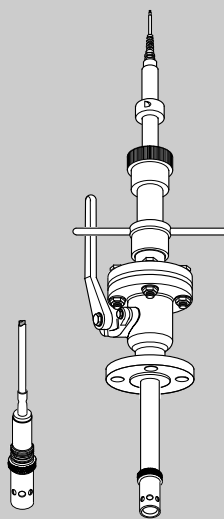
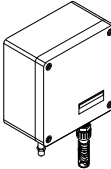
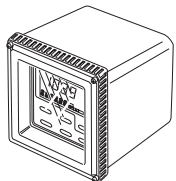
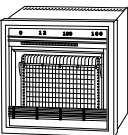

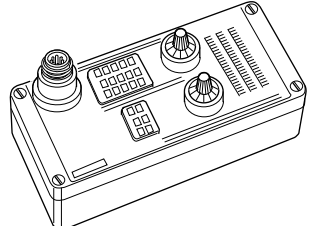
The SC4A 19mm in-line sensor has been designed according to EHEDG guidelines for sterilizable applications, tested by TNO (TNO report V99.930).

### FEATURES

- Precise individually calibrated cell constant.
- Fast temperature response.
- Built-in Pt  $1000\Omega$  RTD temperature sensor.
- Fixed cable length 3, 5, 10, 15 or 20 metres.
- Direct process insertion.
- Wide range of mountings.
- Compatible with PR4A retractably assembly.
- The sensor is polished to meet pharmaceutical requirements.



### SYSTEM CONFIGURATION

<p>Sensor</p> 	<p>Fitting (retractable)</p> 	<p>Connecting Equipment</p> 	<p>Converter</p> 	<p>Recorder</p> 
		<p>Cable</p> 	<p>Miscellaneous</p> 	

**SPECIFICATIONS SC4A-AD**

**General specifications**

**Materials**

**Wetted Parts**

- a. body & electrodes : Stainless steel AISI 316  
or Titanium grade 2 or 3
- b. O-ring : Viton
- c. mounting adapter : PVDF or  
Stainless steel AISI 316

**Operating Specifications (Sensor)**

- Measuring system : 2-electrode
- Maximum pressure : 10 Bar (142 PSIG)
- Maximum temperature : 110 °C (230 °F)
- Temperature response : < 1 minute for 90% of a  
step change
- Sterilize : At 135°C (275 °F)

**Shipping details**

- Package size : wxhxd 220 x 220 x 90 cm  
wxhxd 215 x 150 x 55 cm
- package weight : Approx. 1.6 kg, 3.5 lb

Model Code	Suffix code	Option	Description
SC4A			19 mm conductivity sensor
	-T	.....	Titanium
	-S	.....	Stainless steel
Fitting-type	-AD	.....	For adapter mounting
Sensor-length	-09	.....	9 cm
	-15	.....	15 cm
Cellconstant	-002	.....	0.02/cm
	-010	.....	0.1/cm
Cable length	-03	.....	3 meter
	-05	.....	5 meter
	-10	.....	10 meter
	-15	.....	15 meter
	-20	.....	20 meter
	-T1	.....	Pt1000
AD only		/PS .....	3/4" stainless steel adapter
		/PF .....	3/4" PVDF adapter
Certificates		/Q .....	Quality Inspection Certificate

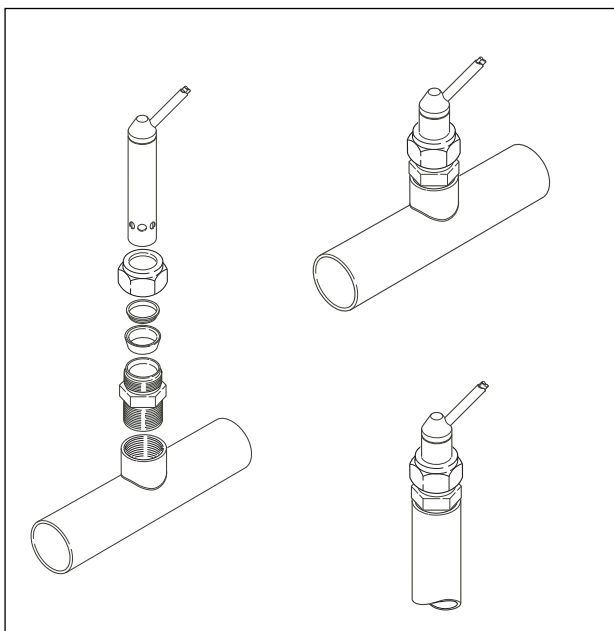


Figure 1. Mounted sensor with the option /PS and /PF

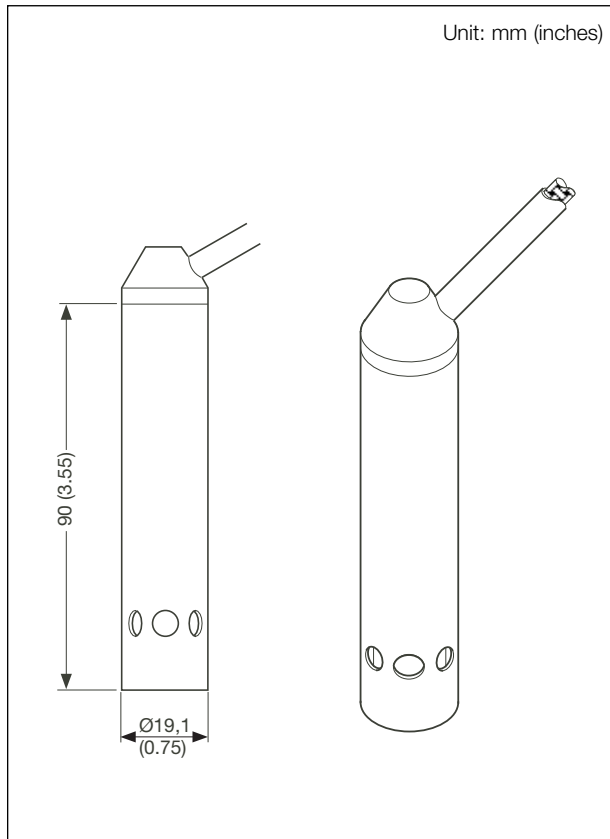


Figure 2. Sensor SC4A-AD-09

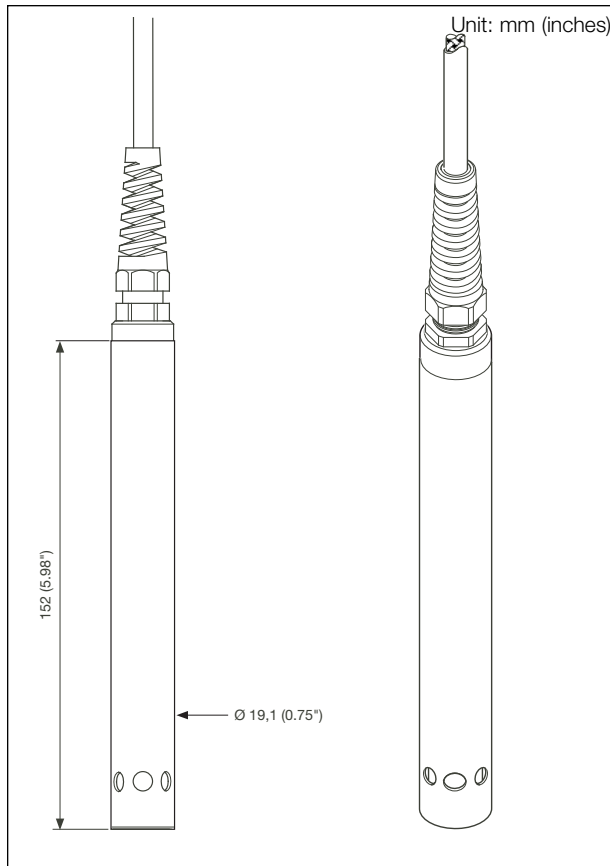


Figure 3. Sensor SC4A-AD-15



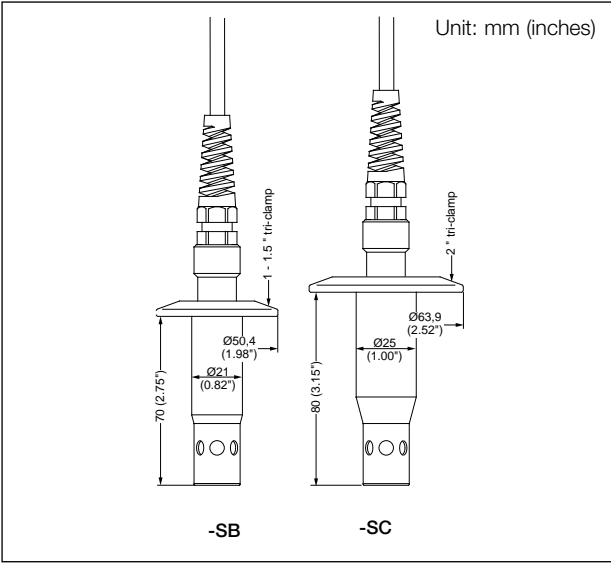


Figure 7. Sensor SC4A

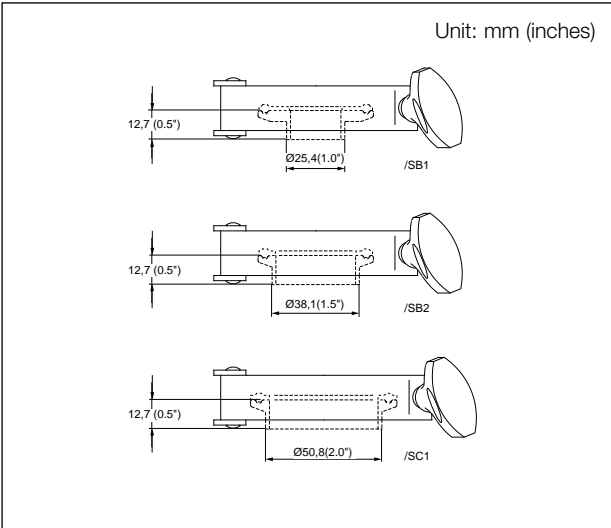


Figure 8. Tri-clamp options

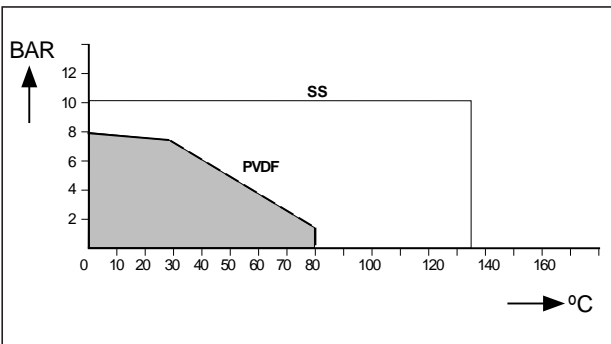


Figure 9. Process/temperature relationship

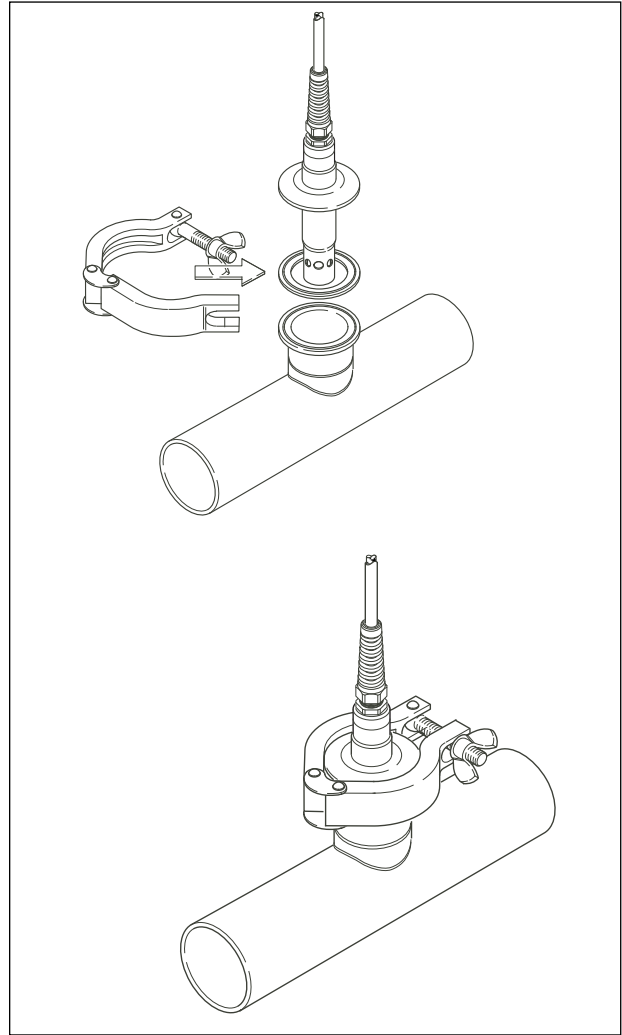


Figure 10. Mounted Sensor SC4A with the option /SB or /SC

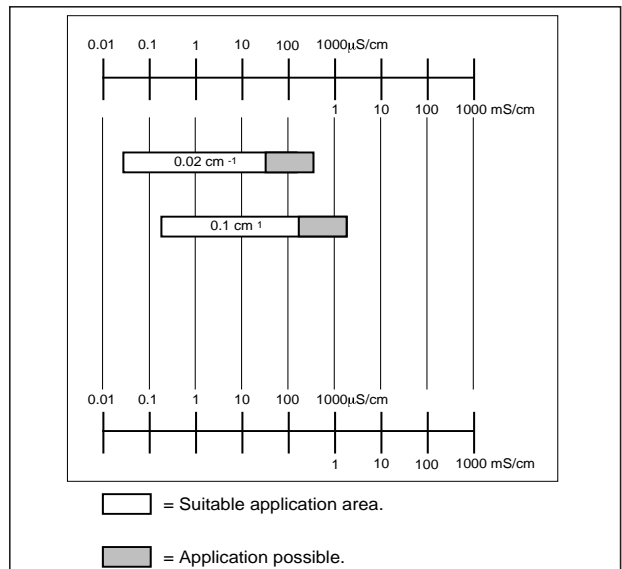


Figure 11. Suitable application area

## SPECIFICATIONS SC4A-PR

### General specifications

#### Materials

#### Wetted Parts

- a. body & electrodes : Stainless steel AISI 316  
or Titanium grade 2 or 3
- b. insulations : Viton
- c. mounting adapter : Retractable fitting

### Operating Specifications (Sensor)

- Measuring system : 2-electrode
- Maximum pressure : 10 Bar (142 PSIG)
- Maximum temperature : 110 °C (230 °F)
- Temperature response : < 1 minute for 90% of a  
step change
- Sterilize : At 135°C (275 °F)

### Shipping details

- Package size : wxhxd 220 x 220 x 90 cm  
wxhxd 215 x 150 x 55 cm
- package weight : Approx. 1.6 kg. 3.5 lb

Model Code	Suffix code	Option	Description
SC4A			19 mm conductivity sensor
	-T	.....	Titanium
	-S	.....	Stainless steel
Fitting-type	-PR	.....	For retractable mounting
Always	-NN	.....	fixed length
Cellconstant	-002	.....	0.02/cm
	-010	.....	0.1/cm
Cable length	-03	.....	3 meter
	-05	.....	5 meter
	-10	.....	10 meter
	-15	.....	15 meter
	-20	.....	20 meter
	-T1	.....	Pt1000
Certificates		/Q.....	Quality Inspection Certificate

## Model PR4A Retractable Conductivity Fitting

A modern trend in process control analysers is to make the measurement with an on-line retractable sensor. Applications for the PR4A retractable fittings can be found in all processes where the sensor needs to be removed without interrupting continuity (e.g. anaerobic, toxic or pressurised systems). The Yokogawa design ensures the safe retraction of the sensor from the process without a shut-down.

The optional adapters make selection of a suitable construction easy. Both flanged and tapered thread connections are available in DIN or ANSI versions. The standardised connection ISO 228/I-G1<sup>1</sup>/<sub>4</sub> (1<sup>1</sup>/<sub>4</sub> inch BSPP) is also used for weld-in sockets.

When inserted, the probe can be locked at any position (between the minimum and maximum) with a locking ring. In addition, optional flush ports make cleaning without complete disassembly possible.

The choice between stainless steel and titanium as construction materials, make use in corrosive applications possible. For safety reasons Yokogawa recommends the use of a flanged ball-valve wherever possible.

### FEATURES

- Specially designed T-bar locking mechanism for additional safety
- Adjustable insertion depth for optimal positioning in the process.
- Easy sensor maintenance.
- Damped probe retraction by friction ring, for safety in pressurized systems.
- Adaptable to most installations by a range of options.
- Optional flush ports for cleaning or calibration purposes.
- Compatible with Yokogawa sensor check.

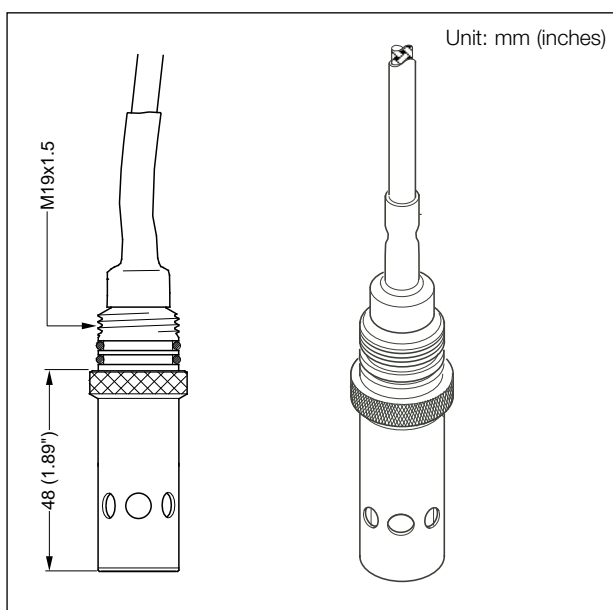
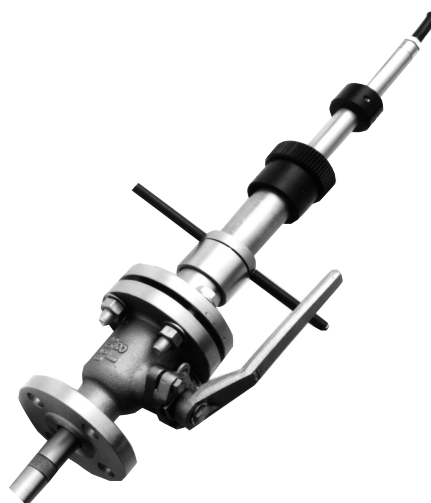


Figure 12. SC4A -PR



**A. Wetted materials**

Model PR4A-S (Stainless steel)  
 - Probe : Stainless steel AISI 316  
 - O-ring seals : Viton 70° shore

Model PR4A-T (Titanium)  
 - Probe : Titanium. Grade 2 or 3  
 - O-ring seals : Viton 70° shore

**B. Non-wetted materials**

: Stainless steel (AISI 316) and polyphenylene sulphide (PPS)

**C. Insertion length**

: The dimensional drawing indicates the maximum insertion length for both specified probe lengths.

**D. Pressure/temperature ratings**

- Static conditions : 1 MPa at 20°C (68 °F)  
 : 1 MPa at 110°C (230 °F)  
 - Operating conditions maintenance : max. 500 kPa  
 : max. 100°C (212 °F)  
 - Flange ratings : DIN flange DN25 PN16  
 : ANSI flange 1" 150 lbs

**E. - Weight**

: Approx 2.5 kg (stainless steel version without ball-valve)

**MODEL AND SUFFIX CODES**

Model	Suffix Code	Option Code	Description
PR4A	.....	.....	Retractable 19 mm conductivity holder
Material	-S .....	.....	Stainless steel Type AISI 316
	-T .....	.....	Titanium. Grade 2 or 3
Length	-05 .....	.....	0.5 m
	-10 .....	.....	1.0 m
Options	/M.....	.....	3.1.B certificate
	/T.....	.....	Pressure certificate
Options	SS.	Ti.	
	/SBS	/TBS	Adapter R1-G1 k
	/SNS	/TNS	Adapter 1 NPT-G1 k
	/SDS	/TDS	DIN flange DN25 PN16+adapter
	/SUS	/TUS	ANSI flange 1"-150 lbs+adapter
	/SES	/TES	DIN fl.DN25 PN16+adapter (flush ports)
	/SVS	/TVS	ANSI fl.1"-150 lbs+adapter (flush ports)
	/SWR		Straight welding adapter
	/SWA		Angled at 15 degrees welding adapter
	/SBB		Ballv. G1 female+adapter
	/SNN		Ballv. 1" NPT female+adapter
/SDD		Ballv. DIN fl. DN25 PN16+adapter	
/SUU		Ballv. ANSI fl. 1"-150 lbs+adapter	
/SED		Ballv. DIN fl. DN25+adapter (flush ports)	
/SVU		Ballv. 1" ANSI+adapter (flush ports)	

Note: The titanium ball valve options must be ordered as a separate item, example: BV20/TBB

**WIRING DIAGRAM**

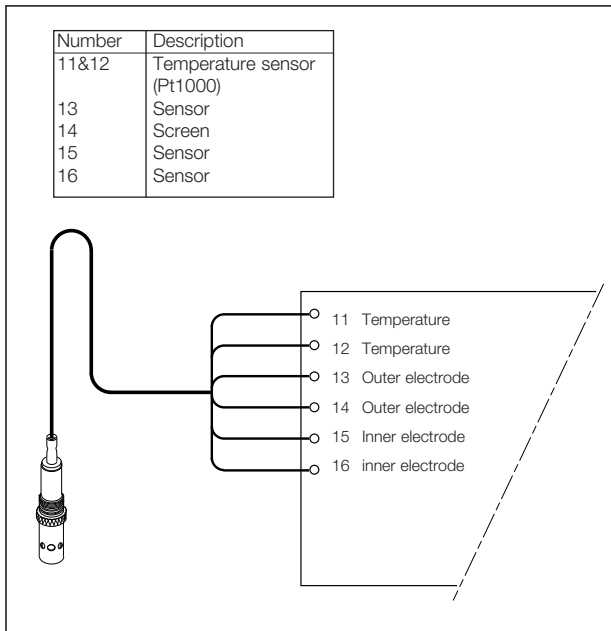


Fig. 13 SC4A Sensors with integrated cable

**Table 1. Adapters**

Model	Option Code	Description
BV20		Titanium ball valve 1" (25 mm)
	/TBB	Ball valve G1 female + adapter
	/TNN	Ball valve 1" NPT female + adapter
	/TDD	Ball valve DIN fl. DN25 PN16 + adapter
	/TUU	Ball valve ANSI fl. 1"-150 lbs + adapter
	/TED	Ball valve DIN fl. DN25 PN16 + adapter (flush ports)
	/TVU	Ball valve ANSI fl. 1"-150 lbs, + adapter (flush ports)

**Table 2. Option codes**

Option	Drawing	Option	Drawing
/SBS, /TBS	A	/SBB, /TBB*	A, D
/SNS, /TNS	A	/SNN, /TNN*	A, D
/SDS, /TDS	B, C	/SDD, /TDD*	B, C, E
/SUS, /TUS	B, C	/SUU, /TUU*	B, C, E
/SES, /TES	F, C	/SED, /TED*	F, C, E
/SVS, /TVS	F, C	/SVU, /TVU*	F, C, E
/SWR	H		
/SWA	G		

\*Note: The titanium ball valve options must be ordered as a separate item, example: BV20/TBB

**EXTERNAL DIMENSIONS**

Unit: mm (inches)

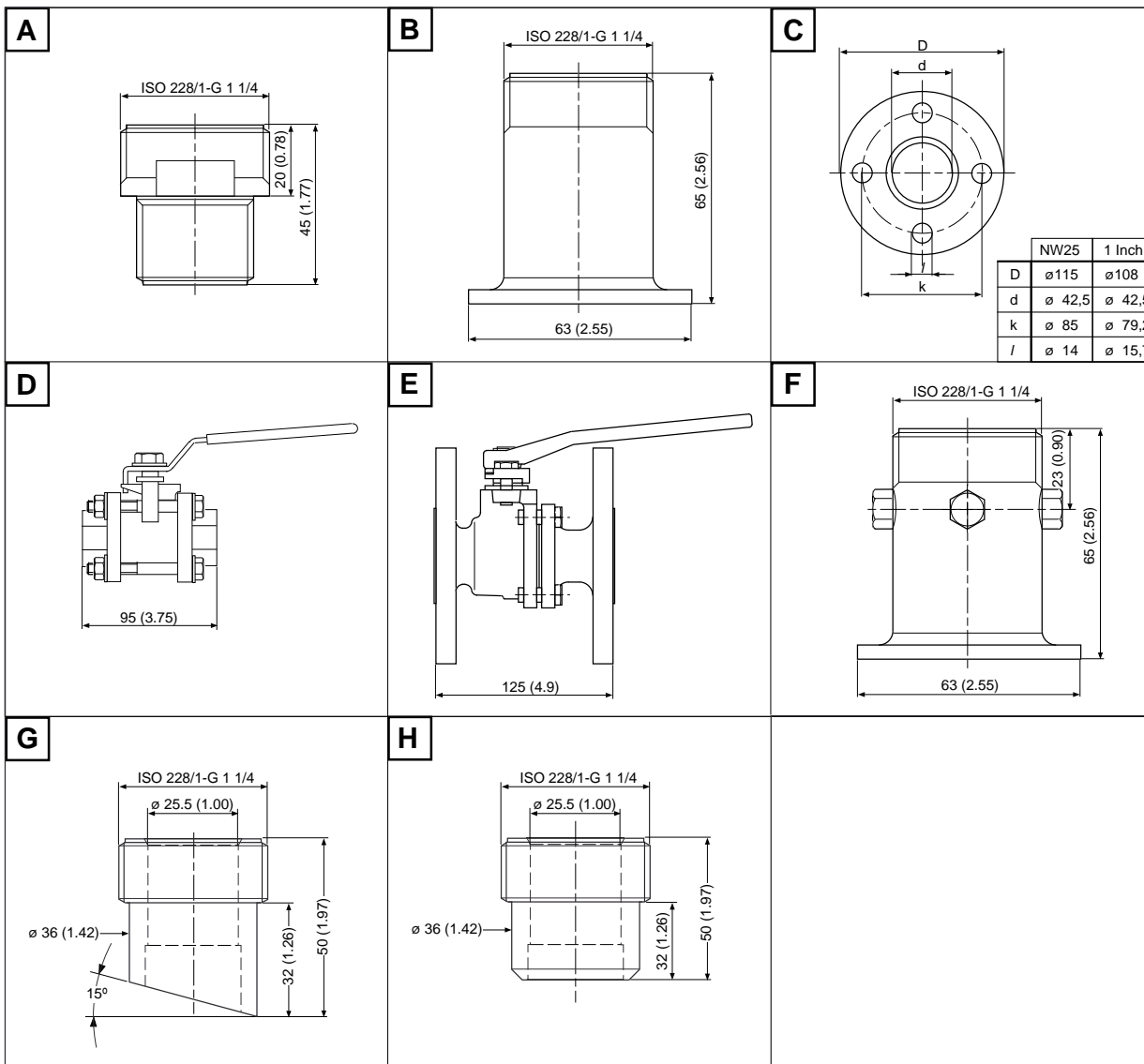
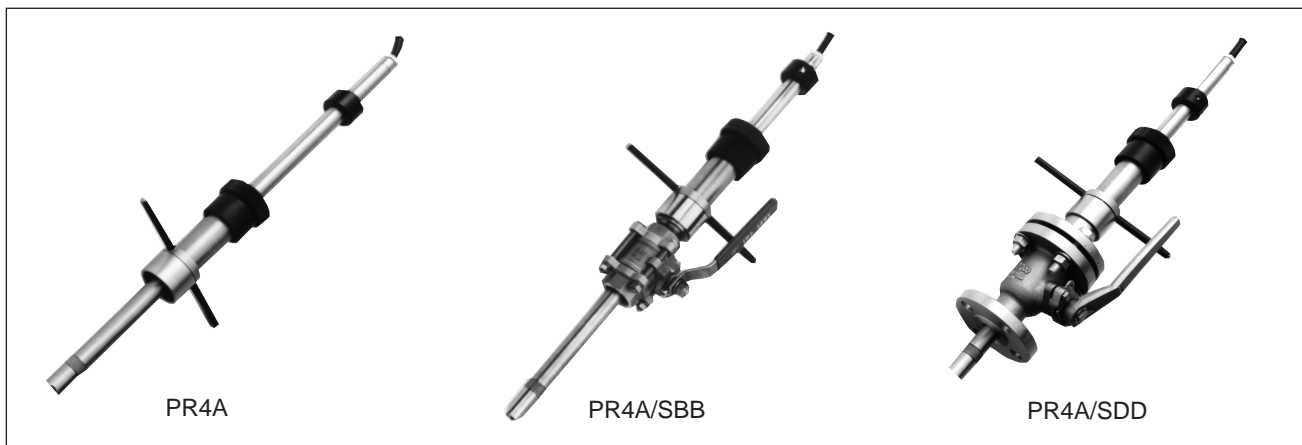


Fig. 14 PR4A options

**MODELS**






## SPARE PARTS SC4A

Spare part nr.	Description
K1500BE	O-ring set (Viton) 10 pcs /PR
K1500BT	Mounting nut
K1542CW	/PF 3/4" PVDF adapter
K1542DF	/PS 3/4" Stainless steel adapter
K1542DG	Seal rings (Viton) 3 pcs-SB1
K1542DH	Seal rings (Viton) 3 pcs-SB2
K1542DJ	Seal ring (Viton) 3 pcs-SC1
K1542DF	3/4" Stainless steel adapter
K1542DK	O-ring set (Viton) 3 pcs -SA
K1500DY	Clamp ring set, /PS
K1520EJ	Straight weld in adapter, SS
K1520EK	Angled welding socket 15°
K1542FA	Straight welding socket and mounting nut
K1542FB	Angle welding socket 15° and mounting nut
K1542FC	Welding clamp 1"
K1542FE	Welding clamp 2"
K1542FF	Welding clamp 1 1/2"

## SPARE PARTS PR4A

Spare part	Description
K1520AW	Cable gland for PR20/PR4A
K1520AY	O-ring set-2 viton, PR20/PR4A
K1520DZ	Adapter 1"NPT-male, SS
K1520EJ	Straight weld-in adapter, SS
K1520EK	Angled weld-in adapter, SS
K1520KC	Main fixing screw, retr. holders
K1520KD	Clamping ring, retr. holders
K1520KF	Position clip assy, retr holder
K1520TA	Clamping set SS, retr. holder
K1520TF	Nut for PR20/PR4A
K1520TK	Key for retr. holders
K1520TN	Outer tube 0,5m SS, retr. holder
K1520UB	Clamping set Ti, retr. holder
K1520UF	Outer tube 0,5m Ti, retr. holder
K1520UH	Outer tube 1,0m SS, retr. holder
K1520UJ	Outer tube 1,0m Ti, retr. holder
K1522UW	Adapter ISO 7/1-R1
K1522VC	/SDS for PR20/PR4A
K1522VD	/SUS for PR20/PR4A
K1522VE	/SES for PR20/PR4A
K1522VF	/SVS for PR20/PR4A
K1522VG	/SBB for PR20/PR4A
K1522VH	/SNN for PR20/PR4A
K1522VJ	/SDD for PR20/PR4A
K1522VK	/SUU for PR20/PR4A
K1522VL	/SED for PR20/PR4A
K1522VM	/SDS for PR20/PR4A
K1522VN	/TBS for PR20/PR4A
K1522VP	/TNS for PR20/PR4A
K1522VQ	/TDS for PR20/PR4A
K1522VR	/TUS for PR20/PR4A
K1522VS	/TES for PR20/PR4A
K1522VT	/TVS for PR20/PR4A
K1541DA	Ball valve 1" ANSI 150 lbs
K1541DB	Ball valve DIN DN25 PN16
K1541DC	Ball valve G 1"
K1541DD	Ball valve 1" NPT

<p><b>YOKOGAWA</b> </p> <p><b>EUROPEAN HEADQUARTERS</b> Yokogawa Europe B.V. Vanadiumweg 11, 3812 PX AMERSFOORT The Netherlands Tel. +31-33-4641 611 Fax +31-33-4641 610 E-mail: info@yokogawa.nl www.yokogawa-europe.com</p> <p><b>THE NETHERLANDS</b> Yokogawa Nederland B.V. Hoofdveste 11 3992 DH HOUTEN Tel. +31-30-635 77 77 Fax +31-30-635 77 70</p> <p><b>AUSTRIA</b> Yokogawa Austria Ges.m.b.H. Franzensbrückenstrasse 26 A-1021 WIEN Tel. +43-1-2165 043 0 Fax +43-1-2165 043 33</p>	<p></p> <p><b>BELGIUM</b> Yokogawa Belgium N.V./S.A. Minervastraat 16 1930 ZAVENTEM Tel. +32-2-719 55 11 Fax +32-2-725 34 99</p> <p><b>FRANCE</b> Yokogawa Contrôle Bailey S.A. Vélizy Valley 18-20 Rue Grange Dame Rose 78140 VELIZY VILLACOUBLAY Tel. +33-1-39 26 10 00 Fax +33-1-39 26 10 30</p> <p><b>GERMANY</b> Yokogawa Deutschland GmbH Berliner Strasse 101-103 D-40880 RATINGEN Tel. +49-2102-4983 0 Fax +49-2102-4983 22</p>	<p><b>HUNGARY</b> Yokogawa Hungaria Ltd. Alkotás Center 39 C 1123BP BUDAPEST Tel. +36-1-355 39 38 Fax +36-1-355 38 97</p> <p><b>ITALY</b> Yokogawa Italia S.r.l. Vicolo D. Pantaleoni, 4 20161 MILANO Tel. +39-02-66 24 11 Fax +39-02-645 57 02</p> <p><b>SPAIN</b> Yokogawa España S.A. C/Francisco Remiro, N°2, Edif. H 28028 MADRID Tel. +34-91-724 20 80 Fax +34-91-355 31 40</p> <p><b>UNITED KINGDOM</b> Yokogawa United Kingdom Ltd. Stuart Road, Manor Park, RUNCORN Cheshire WA7 1TR Tel. +44-1-928 597100 Fax +44-1-928 597101</p>	<p><b>AUSTRALIA</b> Yokogawa Australia Pty Ltd. Private mail bag 24 Centre Court D3 25-27 Paul Street North NORTH RYDE, N.S.W. 2113 Tel. +61-2-805 0699 Fax +61-2-888 1844</p> <p><b>SINGAPORE</b> Yokogawa Engineering Asia Pte. Ltd. 5 Bedok South Road SINGAPORE 469270 Tel. +65-241 99 33 Fax +65-444 62 52</p> <p><b>JAPAN</b> Yokogawa Electric Corporation 2-9-32, Nakacho, Musashino-shi TOKYO, 180 Tel. +81-422 52 5617 Fax +81-422 52 0622</p> <p><b>SOUTH AFRICA</b> Yokogawa South Africa (Pty) Ltd. 67 Port Road, Robertsham Southdale 2135, JOHANNESBURG Tel. +27-11-680-5420 Fax +27-11-680-2922</p>	<p><b>UNITED STATES OF AMERICA</b> Yokogawa Corporation of America 2 Dart Road NEWNAN, GA 30265-1040 Tel. +1-770-253 70 00 Fax +1-770-251 20 88</p> <p><b>ISO 9001</b> </p> <p><b>CENTRAL/EAST REGION</b> Via Yokogawa Austria: Czechia, Slovakia, Poland, Croatia, Slovenia, Jugoslavia, Bulgaria, Romania, Macedonia, Bosnia &amp; Herzegovina</p> <p><b>Distributors in:</b> Denmark, Finland, Greece, Norway, Portugal, Sweden, Switzerland and Turkey.</p>
--	--	--	---	--

Block 02, 07-99

GS 12D7J4-01E-H

Subject to change without notice

Copyright©

Printed in The Netherlands, 04-912 (A) Q