
User's Manual

Model ISC40G(S) Sensors and Fittings for Inductive Conductivity Measurement



(BG)

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(CZ)

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(D)

Alle Betriebsanleitungen für ATEX Ex bezogene Produkte stehen in den Sprachen Englisch. Sollten Sie die Betriebsanleitungen für Ex-Produkte in Ihrer Landessprache benötigen, setzen Sie sich bitte mit Ihrem örtlichem Yokogawa-Vertreter in Verbindung.

(DK)

Alle brugervejledninger for produkter relateret til CE er tilgængelige på engelsk. Skulle De ønske yderligere oplysninger om håndtering af CE produkter på eget sprog, kan De rette henvendelse herom til den nærmeste Yokogawa afdeling eller forhandler.

(EST)

Kõik ATEX Ex toodete kasutamishendid on esitatud inglise keeles. Ex seadmete muukeelse dokumentatsiooni saamiseks pöörduge lähima lokagava (Yokogawa) kontori või esindaja poole.

(E)

Todos los manuales de instrucciones para los productos antiexplosivos de ATEX están disponibles en inglés. Si desea solicitar las instrucciones de estos artículos antiexplosivos en su idioma local, deberá ponerse en contacto con la oficina o el representante de Yokogawa más cercano.

(F)

Tous les manuels d'instruction des produits ATEX Ex sont disponibles en langue anglaise. Si vous nécessitez des instructions relatives aux produits Ex dans votre langue, veuillez bien contacter votre représentant Yokogawa le plus proche.

(GB)

All instruction manuals for ATEX Ex related products are available in English. Should you require Ex related instructions in your local language, you are to contact your nearest Yokogawa office or representative.

(GR)

Όλα τα εγχειρίδια λειτουργίας των προϊόντων με ATEX Ex διατίθενται στα Αγγλικά. Σε περίπτωση που χρειάζεστε οδηγίες σχετικά με Ex στην τοπική γλώσσα παρακαλούμε επικοινωνήστε με το πλησιέστερο γραφείο της Yokogawa ή αντιπροσωπο της.

(H)

Az ATEX Ex műszerek gépkönyveit angol nyelven adjuk ki. Amennyiben helyi nyelven kéri az Ex eszközök leírását, kérjük keressék fel a legközelebbi Yokogawa irodát, vagy képviselőt.

(I)

Tutti i manuali operativi di prodotti ATEX contrassegnati con Ex sono disponibili in inglese. Se si desidera ricevere i manuali operativi di prodotti Ex in lingua locale, mettersi in contatto con l'ufficio Yokogawa più vicino o con un rappresentante.

(LV)

Visas ATEX Ex kategorijas izstrādājumu Lietošanas instrukcijas tiek piegādātas angļu valodās. Ja vēlaties saņemt Ex ierīšu dokumentāciju citā valodā, Jums ir jāsazinās ar firmas Jokogava (Yokogawa) tuvāko ofisu vai pārstāvi.

(LT)

Visos gaminiø ATEX Ex kategorijos Eksploatavimo instrukcijos teikiami anglø kalbomis. Norëdami gauti priestaisø Ex dokumentacijà kitomis kalbomis susisiekitë su atimiausiu bendrovës Yokogawa biuru arba atstovu.

(M)

Il-manwali kollha ta' l-istruzzjonijiet għal prodotti marbuta ma' ATEX Ex huma disponibbli bl-Ingliż. Jekk tkun teħtiegħ struzzjonijiet marbuta ma' Ex fil-lingwa lokali tiegħek, għandek tikkuntattja lill-eqreb rappreżentant jew ufficiċju ta' Yokogawa.

(NL)

Alle handleidingen voor producten die te maken hebben met ATEX explosiebeveiliging (Ex) zijn verkrijgbaar in het Engels. Neem, indien u aanwijzingen op het gebied van explosiebeveiliging nodig hebt in uw eigen taal, contact op met de dichtstbijzijnde vestiging van Yokogawa of met een vertegenwoordiger.

(P)

Todos os manuais de instruções referentes aos produtos Ex da ATEX estão disponíveis em Inglês. Se necessitar de instruções na sua língua relacionadas com produtos Ex, deverá entrar em contacto com a delegação mais próxima ou com um representante da Yokogawa.

(PL)

Wszystkie instrukcje obsługi dla urządzeń w wykonaniu przeciwwybuchowym Ex, zgodnych z wymaganiami ATEX, dostępne są w języku angielskim. Jeżeli wymagana jest instrukcja obsługi w Państwa lokalnym języku, prosimy o kontakt z najbliższym biurem Yokogawy.

(RO)

Toate manualele de instructiuni pentru produsele ATEX Ex sunt in limba engleza. In cazul in care doriti instructiunile in limba locala, trebuie sa contactati cel mai apropiat birou sau reprezentant Yokogawa.

(S)

Alla instruktionsböcker för ATEX Ex (explosionssäkra) produkter är tillgängliga på engelska. Om Ni behöver instruktioner för dessa explosionssäkra produkter på annat språk, skall Ni kontakta närmaste Yokogawakontor eller representant.

(SF)

Kaikkien ATEX Ex-tyyppisten tuotteiden käyttöohjeet ovat saatavilla englannin-. Mikäli tarvitsette Ex-tyyppisten tuotteiden ohjeita omalla paikallisella kielellänne, ottakaa yhteyttä lähimpään Yokogawa-toimistoon tai -edustajaan.

(SK)

Všetky návody na obsluhu pre prístroje s ATEX Ex sú k dispozícii v jazyku anglickom. V prípade potreby návodu pre Ex-prístroje vo Vašom národnom jazyku, skontaktujte prosím miestnu kanceláriu firmy Yokogawa.

(SLO)

Vsi predpisi in navodila za AEX Ex sorodni pridelki so pri roki v angliščini. Če so Ex sorodna navodila potrebna v vašem tukejnem jeziku, kontaktirajte vaš najbliži Yokogawa office ili predstavnika.

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1 INTRODUCTION

1.1 General

The sensor and fitting program for inductive conductivity measurement (model ISC40) is designed to meet the most common installation requirements in terms of material compatibility, process connections and flow dynamics. The various installation possibilities are described and illustrated in this manual.

The following categories of installation can be recognised:

1. Direct mounting of sensors in tank wall or customer supplied flanges
2. Cost effective installation of sensors using process adapters
3. Maintenance friendly installation of sensors using in-line subassemblies
4. Installation in flow chambers for measurements in sample streams or bypass loops
5. Installation in immersion fittings for measurement in open tanks or channels

Within the wide range of process adapters, subassemblies, flow fittings and immersion fittings it is easy to find the appropriate installation that fits the application (a wide choice of materials), the plant installation practice (a wide choice of process connections) and the maintenance procedures.

1.2 Unpacking and Checking

Upon delivery, unpack the sensor carefully and inspect it to ensure that it is not damaged during shipment. If damage is found, retain the original packing material and immediately notify the carrier and the relevant local Yokogawa Sales office. Make sure the Model Code and Serial Number on the sensor are the same as on the packing list. Also check if option(s) that were ordered, are included and correct.

1.3 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 non-warranty 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. Material Safety Data sheets must be included for all components of the process to which the sensor(option)s have been exposed.

1.4 Serial Number definition

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

X₁X₂ Production Location
X₃X₄ Year/Month code
X₅X₆ X₇X₈ X₉ Tracking number

Example: N1B600028

Table 1:
Production year according to
DIN. IEC 60062

Year	Yearcode	Year	Yearcode
2012	C	2024	S
2013	D	2025	T
2014	E	2026	U
2015	F	2027	V
2016	H	2028	W
2017	J	2029	X
2018	K	2030	A
2019	L	2031	B
2020	M	2032	C
2021	N	2033	D
2022	P	2034	E
2023	R	2035	F

Table 2:
Production month code according to
DIN. IEC 60062

Month	Monthcode
January	1
February	2
March	3
April	4
May	5
June	6
July	7
August	8
September	9
October	O
November	N
December	D

2 GENERAL SPECIFICATIONS

The ISC40 inductive conductivity sensor is suitable for use with the Yokogawa inductive conductivity analyzers.

2.1 Measuring elements

: Toroids with high permeability magnetic material
Pt1000 or 30k temperature element

2.2 Materials

Wetted parts sensor

Body ISC40*-G* : 30% glass filled PEEK, FDA approved

Body ISC40*-T* : PFA, FDA approved

Non-wetted parts sensor

Sealing gasket : Viton

Thread part : AISI 316 SS

Options for sensor

All options except /TFD: AISI 316 SS and O-ring material as wetted part

/TFD : AISI 316 SS as non-wetted part

TFM and Kalrez as wetted part

2.3 Functional specifications (at 25°C)

Temperature element : Pt1000 to IEC 751
30k NTC

Installation factor : 1.88 cm⁻¹ nominal for PEEK sensor

3.00 cm⁻¹ nominal for PFA sensor

Actual installation can change this factor.

If there is less than 25mm spacing between sensor and holder, in-situ calibration is necessary to meet the specified accuracies (see fig. 1)

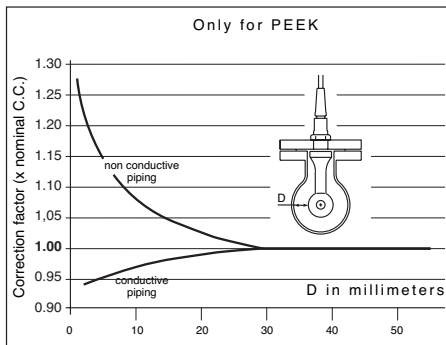


Fig 1: Actual installation factor as function of spacing around the sensor

Note: The ISC40 temperature sensor is designed for cell compensation and for indication. It is **NOT** designed for process temperature control.

2.4 Dynamic specifications

Response time : $t_{90} < 5$ min. for PEEK sensor

conductivity : $t_{90} < 10$ min. for PFA sensor

2.5 Operating range

Conductivity : 0 – 2000 mS/cm at actual process temperature.

Note: The sensor has an error (0.5 μ S/cm for PEEK model, 1.0 μ S/cm for PFA model) that must be considered when application is chosen.

Temperature : -20°C to 130°C (-4°F to 266°F) for PEEK sensor
 -20°C to 100°C (-4°F to 212°F) for PFA sensor

Pressure : 0 to 20 bar (0 to 290 PSIG) for PEEK sensor
 0 to 10 bar (0 to 145 PSIG) for PFA sensor.

Note: At maximum process temperature the maximum pressure for the PFA sensor is 5 bar (72 PSIG).

Cable length : max 50 meter, in combination with WF10 extension cable and BA10 junction box

2.6 Regulatory standards

CE : Decision 768/2008/EC
 - ATEX : Directive 94/9/EC, as amended by Regulation (EC) no. 1882/2003
 Certificate no. : DEKRA 11ATEX0063 X
 II 1 G Ex ia IIC T4...T6 Ga
 Electrical data : Sensor output circuits (permanently connected cable) connected to a certified intrinsically safe circuit with the following maximum values: $U_i = 19.1$ V; $I_i = 170$ mA; $P_i = 0.8$ W; $C_i = 0$ nF; $L_i = 0$ mH or certified intrinsically safe Yokogawa Inductive Conductivity transmitter model FLXA21 series, model ISC202S series or model IC200S series

Note: The effective internal capacitance C_i and the effective internal inductance L_i of the sensor are depending only upon the properties and the length of the connected cable.

Special conditions (X) : T6 for Tamb. -30°C to 40°C
 T5 for Tamb. -30°C to 95°C
 T4 for Tamb. -30°C to 130°C, depending on sensor body material



WARNING

: The sensor must be installed and used so, that dangers of ignition due to hazardous electrostatic charges cannot occur, especially in the case that the process medium is non-conductive.
 - Pressure : Directive 97/23/EC, as amended by Regulation (EC) no. 1882/2003
 Applying article : 3.3 (Sound Engineering Practice)

IECEX

Applying standards : IEC 60079-0 : 2007
 IEC 60079-11 : 2006
 IEC 60079-26: 2006
 Certificate no. : IECEx DEK 11.0028X
 Ex ia IIC T4...T6 Ga

CSA

Certificate no.	: 2447837 IS, Class I Div. 1, GP A, B, C, D T4...T6 Master Contract no 182892
Electrical data	: Sensor output circuits (permanently connected cable) connected to a certified intrinsically safe circuit with the following maximum values: $U_o = 19.1 \text{ V}$; $I_o = 170 \text{ mA}$; $P_o = 0.8 \text{ W}$; $C_o \geq C_i + C_{\text{cable}}$; $L_o \geq L_i + L_{\text{cable}}$ or certified intrinsically safe Yokogawa Inductive Conductivity transmitter model FLXA21 series, model ISC202S series or model IC200S series
Ambient temperature range	: T6 for Tamb. -30°C to 40°C T5 for Tamb. -30°C to 95°C T4 for Tamb. -30°C to 130°C , depending on sensor body material

Note: Intrinsically safe when connected as per Control Drawing FF1-K1244QY (see fig. 2)

FM

Certificate no.	: 3046320 IS, Class I, Div. 1, Groups A, B, C, D T4...T6
Electrical data	: Sensor output circuits (permanently connected cable) connected to a FM approved intrinsically safe apparatus meeting the entity parameters of the ISC40S: $U_o \leq 19.1 \text{ V}$; $I_o \leq 170 \text{ mA}$; $P_o \leq 0.8 \text{ W}$; $C_o \geq C_i + C_{\text{cable}}$; $L_o \geq L_i + L_{\text{cable}}$ or certified intrinsically safe Yokogawa Inductive Conductivity transmitter model FLXA21 series, model ISC202S series or model IC200S series
Ambient temperature range	: T6 for Tamb. -30°C to 40°C T5 for Tamb. -30°C to 85°C T4 for Tamb. -30°C to 85°C , depending on sensor body material

Note: Intrinsically safe when connected as per Control Drawing FF1-K1244QX (see fig. 3)

2.7 Shipping details

	Package size (LxWxH)
ISC40*-**-03 (05)	: 350 x 270 x 50 mm (13.8 x 10.6 x 2.0 inch)
ISC40*-**-10 (15, 20)	: 320 x 240 x 110 mm (12.6 x 9.5 x 4.3 inch)
	Package weight (app.)
ISC40*-**-03	: 1.0 kg (2.2 lbs)
ISC40*-**-05	: 1.3 kg (2.9 lbs)
ISC40*-**-10	: 1.6 kg (3.5 lbs)
ISC40*-**-15	: 2.1 kg (4.6 lbs)
ISC40*-**-20	: 2.5 kg (5.5 lbs)

2.8 Environmental conditions

Storage temperature	: -30°C to 50°C (-22°F to 122°F)
Water proof	: IP67 (conform IEC 60529), also in combination with the preferred Yokogawa process connections

2.9 Process connections

Process connections are made in combination with a variety of adapters and fittings, which are available in AISI 316 SS, PVC or PVDF (see relevant sections in this manual).

Control Drawing CSA

The ISC40S sensor shall be installed with one of the Yokogawa transmitters model:
• ISC202S • IC200S • FLXA21
with following parameters:

	ISC202S	IC200S	FLXA21
Uo	14.4 V	19.1 V	11.76 V
Io	88 mA	162 mA	60.6 mA
Po	317 mW		178 mW
Lo	4.5 mH	800µH	8 mH
Co	600 nF	254nF	100 nF

or

To a CSA approved intrinsically safe apparatus meeting the entity parameters of the ISC40S:
 $U_o \leq 19.1V$
 $I_o \leq 170mA$
 $P_o \leq 0.8W$
 $C_o \geq C_i + C(cable)$
 $L_o \geq L_i + L(cable)$

The effective inductive capacitance Ci and the effective induced inductance Li of the sensor depends only upon the properties and the length of the connected cable (max 50m).

When installing this equipment, follow the manufacturer’s control drawing. Installing should be in accordance with Canadian Electrical Code Part 1 or CEC Part1.

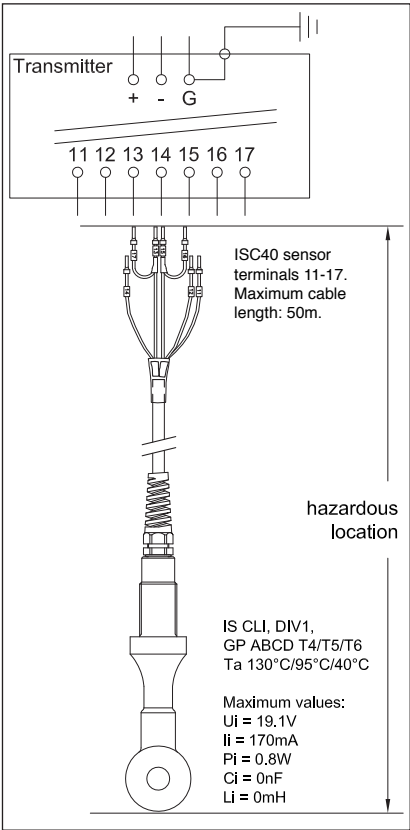
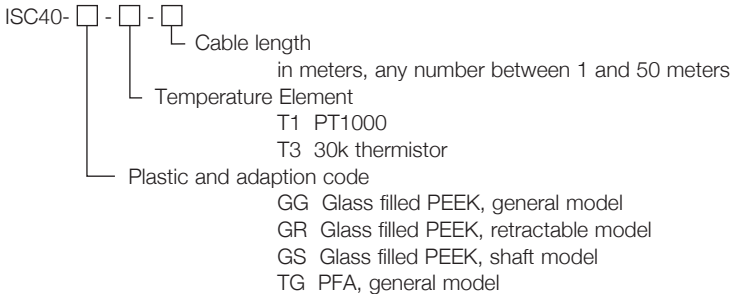


Fig 2: FF1-K1244QY
Control Drawing CSA

Warning: To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing or read, understand and adhere to the manufacturer’s live maintenance procedures.



Control Drawing FM

The ISC40S sensor shall be installed with one of the Yokogawa transmitters model:
• ISC202S • IC200S • FLXA21
with following parameters:

	ISC202S	IC200S	FLXA21
Uo	14.4 V	19.1 V	11.76 V
Io	88 mA	162 mA	60.6 mA
Po	317 mW		178 mW
Lo	4.5 mH	800µH	8 mH
Co	600 nF	254nF	100 nF

or
To a FM approved intrinsically safe apparatus meeting the entity parameters of the ISC40S: $U_o \leq 19.1V$
 $I_o \leq 170mA$
 $P_o \leq 0.8W$
 $C_o \geq C_i + C(cable)$
 $L_o \geq L_i + L(cable)$

The effective inductive capacitance C_i and the effective induced inductance L_i of the sensor depends only upon the properties and the length of the connected cable (max 50m).

When installing this equipment, follow the manufacturer's control drawing. Installing should be in accordance with ANSI/ISA RP 12.06.01 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code (ANSI/NFPA 70).

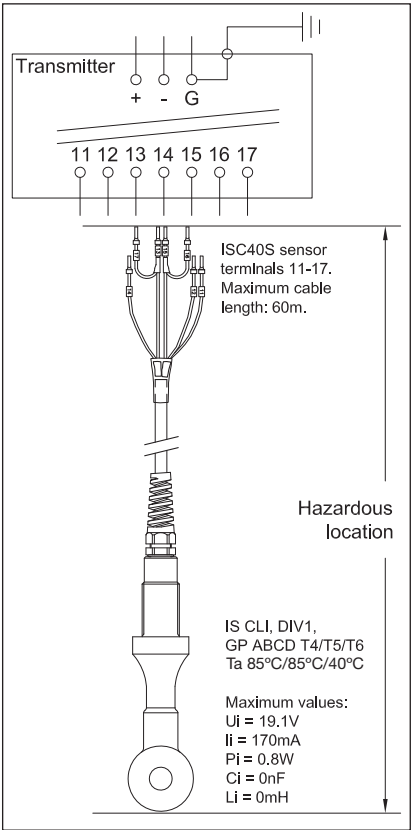
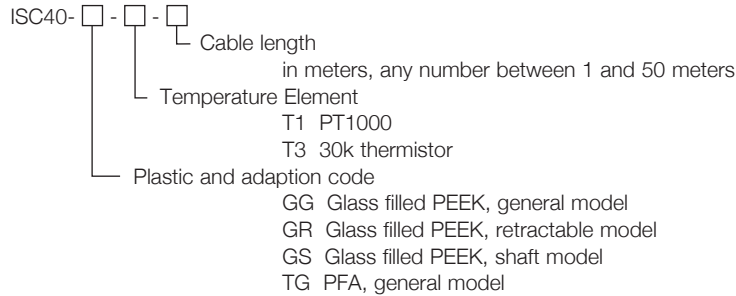


Fig 3: FF1-K1244QX
Control Drawing FM

Warning: To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing or read, understand and adhere to the manufacturer's live maintenance procedures.



3 INSTALLATION OF SENSOR WITH STANDARD OPTIONS

For optimum measurement results, the ISC40 sensor should be installed in a location that offers an acceptable representation of the process composition and **DOES NOT** exceed the specifications of the sensor.

It is important that the process flow is directed through the hole in the donut of the sensor. For this reason the flats on the sensor top part have to be installed perpendicular on the process flow (see fig. 4).

The inductive conductivity measurement technique requires a process fluid surrounding the donut of the sensor. The installation factor mentioned on the label of the sensor cable will assure accurate conductivity measurement under the condition that the donut is surrounded by 25 mm (1") process fluid. If this condition cannot be met, the measurement loop (analyser in combination with sensor) has to be calibrated. Consult the instruction manuals of the analyser for details.

The mounting of the sensor in the process adapters is described in section 3.1. The mounting of the process adapters in the end-users application requires compatibility of materials and process connections.

3.1 Typical installation

3.1.1 Installation of ISC40G(S)-GG (TG) with flange adapters

The ISC40G(S)-GG (TG) sensor is supplied with a flat Viton sealing gasket for compatibility with existing installations. When using the sensor in combination with the new fittings, which are improved by the addition of O-ring seals (see figure 6), the flat Viton gasket should be discarded.

It is important that the access port has a diameter of at least 50 mm (2") to allow insertion of the donut shaped end of the sensor. For more detailed dimensions of the sensor see paragraph 4.

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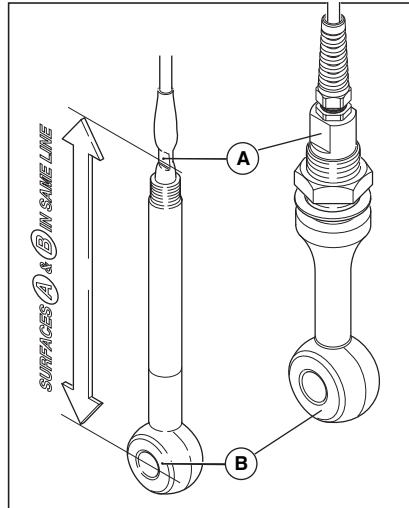


Fig 4: Aligning of sensor donut (B) and flats (A)

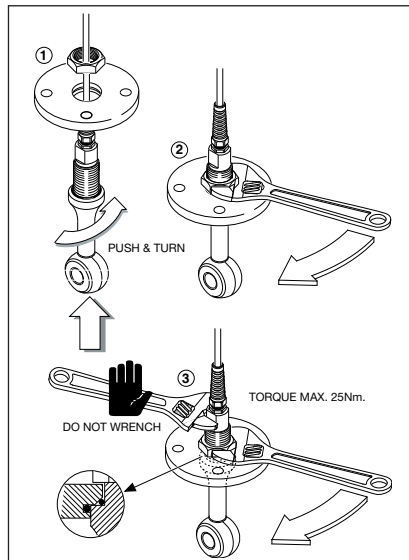


Fig 5: Mounting Procedure ISC40G(S)-GG (TG) with flange adapters

Note: When a torque of more than 25 Nm is applied, the top part of the body of the PFA sensor will be damaged (TG model)

The sensor cable and mounting thread are pulled through the hole of the flange, and the sensor is sealed from the process by tightening the mounting nut. Turning of the sensor by the torque forces can be

avoided by using a wrench on the flats on top of the sensor (see fig. 5). Sensor is installed correctly if the flats are aligned perpendicular on the process flow.

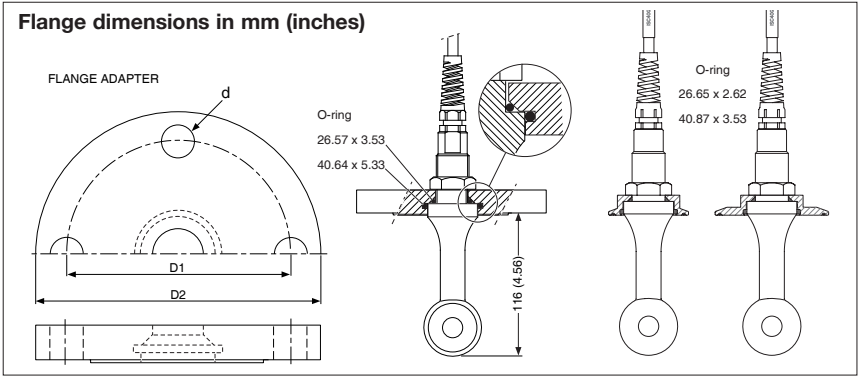


Fig 6: Option /SFA, /SFD, /S2W, /STW

Option	d	D1	D2
/SFA	Ø19 (0.75)	121 (4.76)	152 (6.0)
/SFD	Ø18 (0.71)	125 (4.92)	165 (6.5)
/TFD	Ø18 (0.71)	145 (5.71)	185 (7.3)

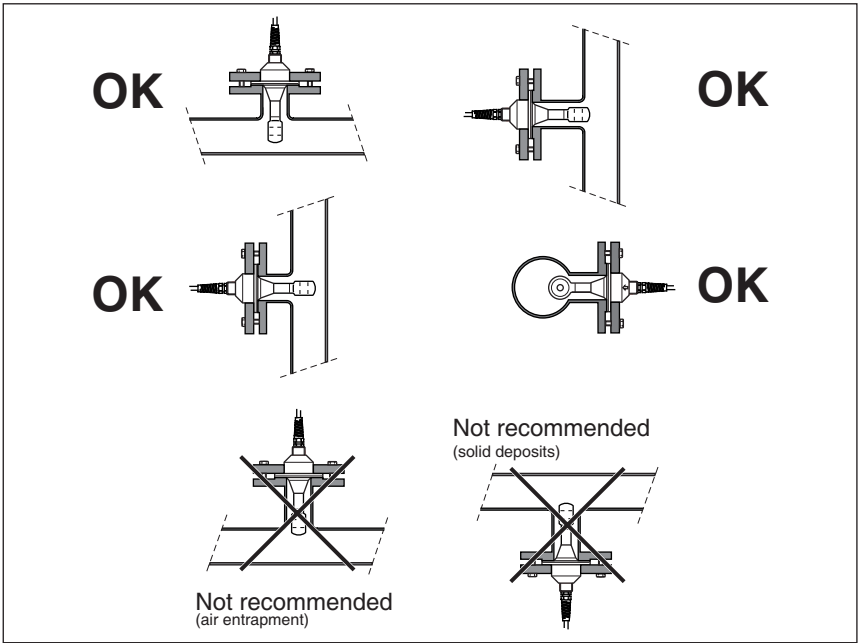


Fig 7: Installation examples

3.1.3 Installation of ISC40G(S)-GS with flange adapters

The ISC40G(S)-GS sensor is designed for sanitary applications. For these applications special process connections are necessary.

Mounting procedure:

- Screw the tube completely in the stainless steel nut.
- Thread the sensor cable through the flange adapter parts in the right sequence.
- Screw the tube hand tight into the flange, a mechanical stop will be felt.
- Tighten the plastic nut onto the sensor; screw the plastic nut completely tight.
- Tighten the stainless steel nut for locking the sensor.

Sensor is installed correctly if the flats on the sensor are aligned perpendicular on the process flow.

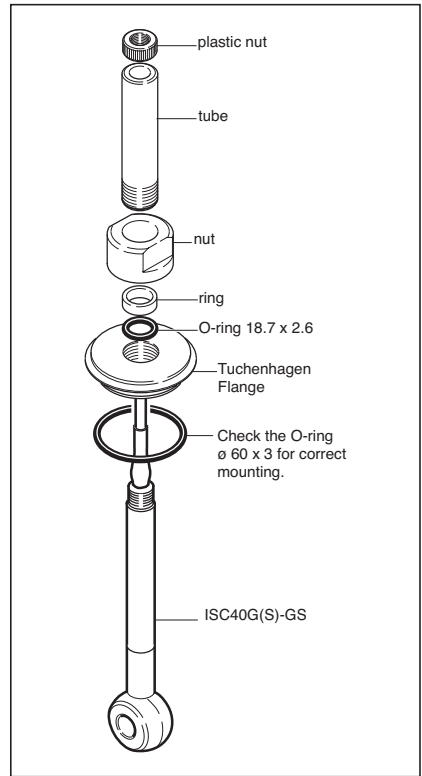


Fig 10: Installation /SFT

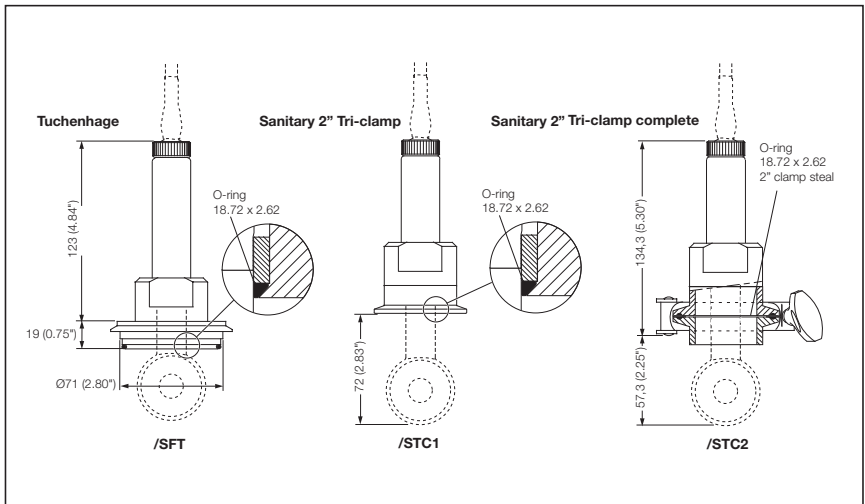


Fig 11: Option /SFT, /STC1, /STC2

4 DIMENSIONS ISC40 SENSOR

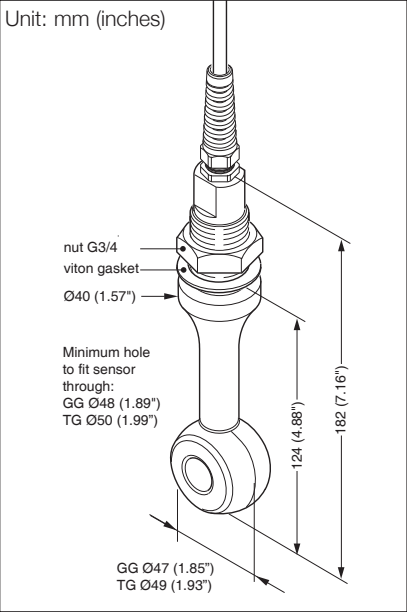


Fig 12: ISC40G(S)-GG (TG)

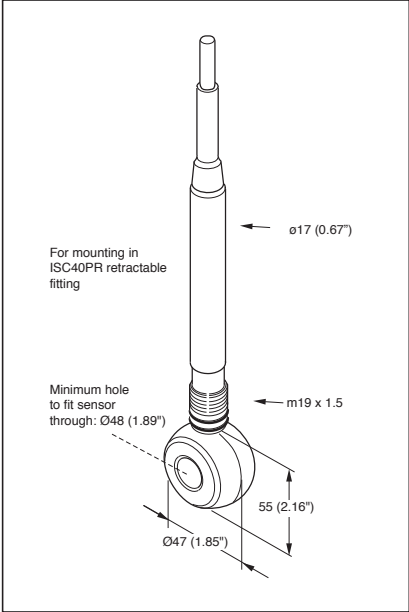


Fig 13: ISC40G(S)-GR

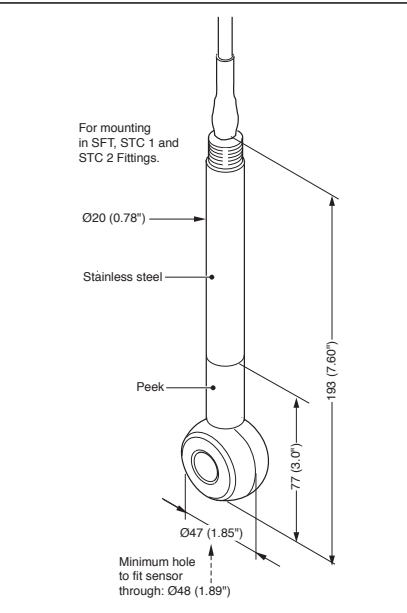


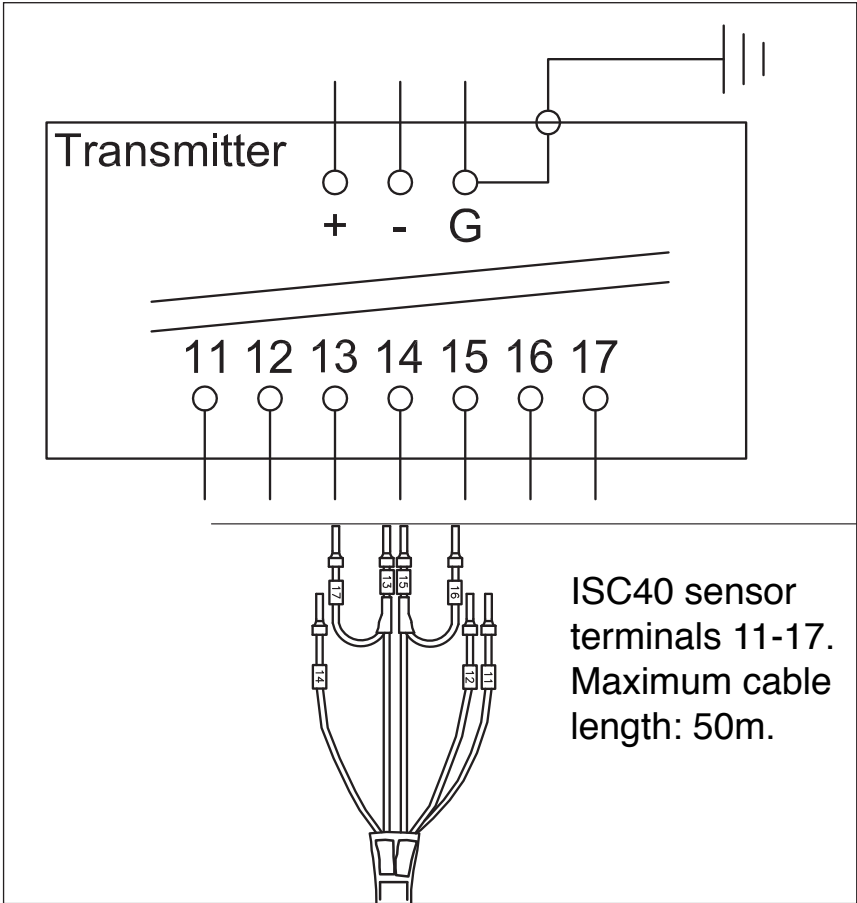
Fig 14: ISC40G(S)-GS

5 WIRING ISC40 SENSOR

The ISC40 sensor is provided with a fixed cable. The connections of this dual coax cable and the Yokogawa Inductive Conductivity analyser are given in table 1.

Table 1: Definition cable and analyzer

Cable wire color	ISC analyser terminal #	Signal description
Red	11	Temperature
Blue	12	Temperature
Yellow	14	Shield
White	15	Primary coil
White (shield)	16	Primary coil
Brown	13	Secondary coil
Brown (shield)	17	Secondary coil



6 MODELCODE ISC40 SENSOR

Model Code	Suffix	Option	Description	
ISC40G			General purpose inductive conductivity sensor	
Sensor type	-GG -GR -GS -TG		Glass filled PEEK, general model Glass filled PEEK, retractable model Glass filled PEEK, shaft model PFA, general model	
Temperature sensor	-T1 -T3		Pt1000 30k thermistor, for IC200 select only T3	
Cable length	-3 -5 -10 -15 -20		03 meter 05 meter 10 meter 15 meter 20 meter	
Options for Sensor Flange adapters -GG, -TG	/SFA /SFD /STW /S2W /TFD /TFN	Material AISI 316 SS AISI 316 SS AISI 316 SS AISI 316 SS TFM, AISI 316 SS TFM	Proc.Connection 2" ANSI 150 lbs NW50-PN16 3" tri-clamp 2" tri-clamp NW65-PN10 For NW65-PN10	
Flange adapters for -GS	/SFT /STC1 /STC2	AISI 316 SS AISI 316 SS AISI 316 SS	Sanitary Tuchenhausen Sanitary 2" tri clamp Tri-clamp complete	
Protection Hose for -TF, -TG, -GG	/PH ☐	03m /05m /10m /15m /20m Same length as the cable		
Certificates	/M /Q	Material certificate Quality certificate	Not for -GR	

7 SPAREPARTS ISC40 SENSOR

Parts ISC40 sensor				
Part no.	Description		Material	Quantity
K1500AM	Gasket		Viton	5
K1500AL	Mounting nut		AISI 316 SS	3
Options ISC40 sensor, Flange adapters				
Part no.	Description	Process connection	Material	O-ring(s)
K1541ZR	/SFA	2" ANSI 150 lbs	AISI 316 SS	Viton
K1541ZQ	/SFD	NW50-PN16	AISI 316 SS	Viton
K1541KB	/STW	3" tri-clamp	AISI 316 SS	EPDM
K1541KC	/S2W	2" tri-clamp	AISI 316 SS	EPDM
K1541XF	/TFD	DN65 PN10	AISI 316 SS,TFM	Kalrez
K1541XG	/TFN	used with DN65 PN10	TFM	Kalrez
K1541ZP	/SFT	Sanitary Tuchenhagen	AISI 316 SS	EPDM
K1541ZG	/STC1	Sanitary 2" tri-clamp	AISI 316 SS	EPDM
K1541ZF	/STC2	Tri-clamp complete	AISI 316 SS	EPDM
K1500HG		T-piece, DN80 flange	DN80 PN10	
K1500HF		T-piece, DN100 flange	DN100 PN10	

Note: Other O-ring materials are available as sparepart

O-rings ISC40 sensor, Flange adapters				
Part no.	Description	Dimensions	Material	Quantity
O-rings /SFA, /SFD				
K1500CA	O-ring set	40.64 x 5.33; 26.57 x 3.53	EPDM	5 sets
K1500CB	O-ring set	40.64 x 5.33; 26.57 x 3.53	Viton	5 sets
K1500CC	O-ring set	40.64 x 5.33; 26.57 x 3.53	Silicon	5 sets
K1500CD	O-ring	40.64 x 5.33	Kalrez	1
K1500CH	O-ring	26.57 x 3.53	Kalrez	1
O-rings /STW				
K1541ZK	O-ring set	40.87 x 3.53; 26.65 x 2.62; 3" seal-clamp	EPDM	2 sets
K1500DL	O-ring set	40.87 x 3.53; 26.65 x 2.62; 3" seal-clamp	Viton	2 sets
K1500DM	O-ring set	40.87 x 3.53; 26.65 x 2.62; 3" seal-clamp	Silicon	2 sets
O-rings /S2W				
K1541ZH	O-ring set	40.87 x 3.53; 26.65 x 2.62; 2" seal-clamp	EPDM	2 sets
K1500DJ	O-ring set	40.87 x 3.53; 26.65 x 2.62; 2" seal-clamp	Viton	2 sets
K1500DK	O-ring set	40.87 x 3.53; 26.65 x 2.62; 2" seal-clamp	Silicon	2 sets
O-rings /TFD, /TFN				
K1500AH	O-ring	29.74 x 3.53	Kalrez	1
O-rings /SFT				
K1500CM	O-ring set	18.72 x 2.62; 60 x 3	EPDM	5 sets
K1500CL	O-ring set	18.72 x 2.62; 60 x 3	Viton	5 sets
K1500CN	O-ring set	18.72 x 2.62; 60 x 3	Silicon	5 sets
O-rings /STC1				
K1500CQ	O-ring	18.72 x 2.62	EPDM	5
K1500CP	O-ring	18.72 x 2.62	Viton	5
K1500CR	O-ring	18.72 x 2.62	Silicon	5
O-rings /STC2				
K1500CT	O-ring set	18.72 x 2.72; 2" seal-clamp	EPDM	5 sets
K1500CS	O-ring set	18.72 x 2.72; 2" seal-clamp	Viton	5 sets
K1500CU	O-ring set	18.72 x 2.72; 2" seal-clamp	Silicon	5 sets

8 EU DECLARATION OF CONFORMITY

We: Yokogawa Europe B.V.
Euroweg 2, 3825 HD Amersfoort
The Netherlands

herewith declare under our sole responsibility that the products, model: **ISC40G** and **ISC40S** further specified with model suffix- and option codes: **As listed in Annex-1 in this document** are manufactured in accordance with the requirements for CE-marking of products as stated in EC Decision:

768/2008/EC on a common framework for the marketing of products

by applying the following standards:

EN-ISO 9001: 2008 Quality management systems - Requirements

Products ISC40G and ISC40S are:

- In compliance with the essential requirements of the specific product legislation:

- Pressure Equipment Directive 97/23/EC (PED)

As amended by Regulation (EC) no. 1882/2003, by applying:

Article 3.3: Sound Engineering Practice

- Produced according to appropriate quality control procedures.

Product ISC40S is:

- In compliance with the essential requirements of the specific product legislation:

- Potentially explosive atmospheres (ATEX) Directive 94/9/EC

As amended by Regulation (EC) no. 1882/2003

by applying the following standards:

EN 60079-0: 2009 Explosive atmospheres – Part 0: Equipment – General requirements

EN 60079-11: 2007 Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i”

EN 60079-26: 2007 Explosive atmospheres – Part 26: Equipment with equipment protection level (EPL) Ga

The provisions fulfilled are:  II 1 G Ex ia IIC T4...T6 Ga

Number of the EC-type Examination Certificate: **DEKRA 11 ATEX 0063 X**

Name of the notified body: DEKRA Certification B.V.

Identification number of the notified body: 0344

Address of the notified body: Utrechtseweg 310, 6812 AR Arnhem, The Netherlands

The CE-mark has been affixed on the product in 2000 for the first time.

Amersfoort, 1 October 2012



H. Leijten
 General Manager
 Yokogawa Process Analyzers (YPA)
 Yokogawa Europe B.V.

9 ISC40FS – FLOW FITTING SUBASSEMBLY

9.1 General Specifications

9.1.1 Materials

Wetted parts

Model ISC40FS-FCSA	: PVDF (Kynar); Viton
Model ISC40FS-PCSA	: Polypropylene; Viton
Model ISC40FS-SCSA	: AISI 316 SS; Viton
Model ISC40FS-SCWN	: AISI 316 SS; Viton

Non-wetted parts

Nut : AISI 304 SS

9.1.2 Operating range

Temperature

Model ISC40FS-FCSA	: Max. 130°C (266°F)
Model ISC40FS-PCSA	: Max. 100°C (212°F)
Model ISC40FS-SCSA	: Max. 150°C (302°F)
Model ISC40FS-SCWN	: Max. 150°C (302°F)

Pressure

Model ISC40FS-FCSA	: Max. 10 bar (150 PSI) at 20°C (68°F) Max. 1 bar (15 PSI) at 130°C (266°F)
Model ISC40FS-PCSA	: Max. 6 bar (90 PSI) at 20°C (68°F) Max. 1 bar (15 PSI) at 100°C (212°F)
Model ISC40FS-SCSA	: Max. 10 bar (150 PSI) at operating temperature
Model ISC40FS-SCWN	: Max. 10 bar (150 PSI) at operating temperature

9.1.3 Shipping details

Package size (LxWxH)	: 215 x 150 x 55 mm (8.46 x 5.90 x 2.17 inch)
Package weight (max.)	: 0.9 kg (2.0 lbs)

9.1.4 Process connections

2" screw-in coupling or weld-in coupling

Note: The ISC40 sensor type GG and TG are supplied with a Viton gasket. This gasket may be used with the older series of ISC40FS fittings. It should be discarded when the sensor is mounted in combination with the ISC40FS type FCSA and PCSA.

9.2 Installation of ISC40 sensor in ISC40FS

The key difference between a sensor adapter and a subassembly is, that with subassembly installation the sensor can be removed from the process installation without removing the subassembly first. This allows easier access to the sensor for maintenance activities. Generally, the subassembly consists of three parts of which one part is fitted permanently to the process installation (welded or threaded); the second part is fitted to the sensor and the third part holds the earlier parts together. In addition to these parts there are elastomeric seals were appropriate. Standard O-ring material is Viton, other O-ring materials are available as sparepart (see Figs 15 and 16).

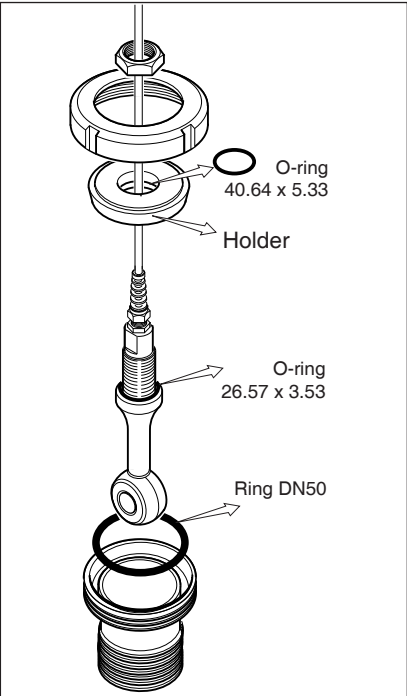


Fig 15: ISC40 sensor in screw-in subassembly ISC40FS-SCSA

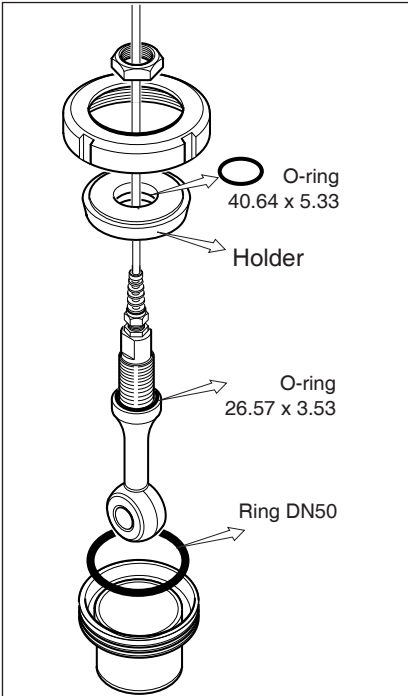


Fig 16: ISC40 sensor in weld-in subassembly ISC40FS-SCWN

9.3 Dimensions ISC40FS

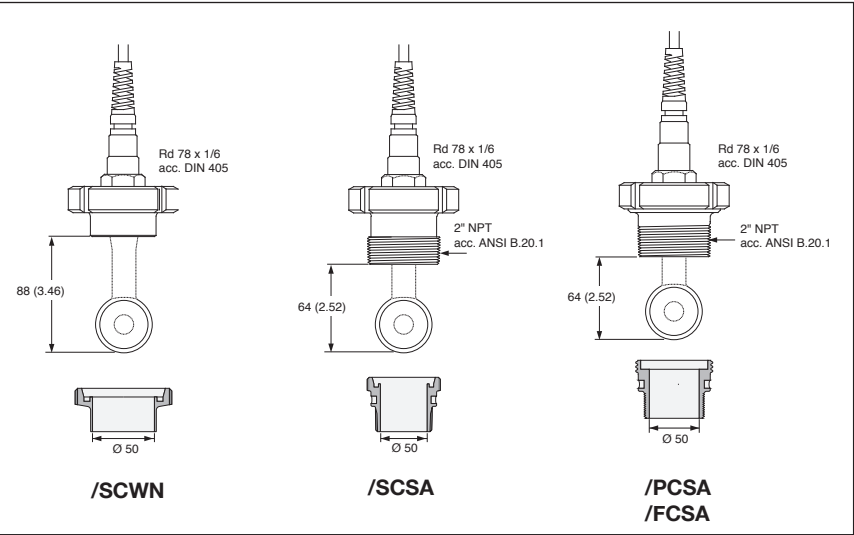


Fig 17: Dimensions ISC40FS with sensor installed (dimensions in mm (inches))

9.4 Modelcode ISC40FS

Model	Suffix	Option	Description
ISC40FS			Flow fitting subassembly
Material	-F -P -S		PVDF Polypropylene Stainless Steel
Process connection	-CS -CW		Dairy Coupling screw-in* Dairy Coupling welded*
Thread type NPT or R	-A -N		NPT No thread (for weld-in couplings)
Options		/M	Material certificate 3.1. EN 10024 (for wetted metal parts only)

* **Note:** according to Din 11851

9.5 Spareparts ISC40FS

Parts ISC40FS subassembly				
Part no.	Description	Dimensions	Material	O-ring
K1541KD	Holder + O-rings	2"	PVDF	Viton
K1541KL	Holder + O-rings	2"	Polypropylene	Viton
K1541KA	Holder + O-rings	2"	AISI 316 SS	Viton

Note: Other O-ring materials are available as sparepart

O-rings ISC40FS subassembly				
Part no.	Description	Dimensions	Material	Quantity
O-rings -FCSA, -PCSA, -FCWN, -PCWN				
K1500DF	O-ring set	40.64 x 5.33; 26.57 x 3.53; 56.52 x 5.33	EPDM	5 sets
K1500DE	O-ring set	40.64 x 5.33; 26.57 x 3.53; 56.52 x 5.33	Viton	5 sets
K1500DG	O-ring set	40.64 x 5.33; 26.57 x 3.53; 56.52 x 5.33	Silicon	5 sets
K1500CD	O-ring	40.64 x 5.33	Kalrez	1
K1500CH	O-ring	26.57 x 3.53	Kalrez	1
K1500DH	O-ring	56.52 x 5.33	Kalrez	1
O-rings -SCSA, -SCWN				
K1500DB	O-ring set	40.64 x 5.33; 26.57 x 3.53; Ring DN50	EPDM	5 sets
K1500DA	O-ring set	40.64 x 5.33; 26.57 x 3.53; Ring DN50	Viton	5 sets
K1500DC	O-ring set	40.64 x 5.33; 26.57 x 3.53; Ring DN50	Silicon	5 sets
K1500CD	O-ring	40.64 x 5.33	Kalrez	1
K1500CH	O-ring	26.57 x 3.53	Kalrez	1
K1500DD	O-ring	53.34 x 5.33	Kalrez	1

Note: O-ring 53.34 x 5.33 (K1500DD) is used as a Kalrez replacement for the Ring DN50.

10 ISC40FF – FLOW FITTING

10.1 General Specifications

10.1.1 Materials

Wetted parts

Model ISC40FF-S	: AISI 316 SS; Viton
Model ISC40FF-P	: Polypropylene; Viton
Model ISC40FF-F	: PVDF (Kynar); Viton

Non-wetted parts : AISI 304 SS or AISI 316 SS

10.1.2 Operating range

Temperature

Model ISC40FF-S	: Max. 150°C (302°F)
Model ISC40FF-P	: Max. 100°C (212°F)
Model ISC40FF-F	: Max. 130°C (266°F)

Pressure

Model ISC40FF-S	: Max. 10 bar (150 PSI) at operating temperature
Model ISC40FF-P	: Max. 6 bar (90 PSI) at 20°C (68°F) Max. 1 bar (15 PSI) at 100°C (212°F)
Model ISC40FF-F	: Max. 10 bar (150 PSI) at 20°C (68°F) Max. 1 bar (15 PSI) at 130°C (266°F)

10.1.3 Shipping details

Package size (LxWxH)	: 250 x 150 x 100 mm (9.84 x 5.90 x 3.94 inch)
Package weight (max)	: 1.5 kg (3.3 lbs)

10.1.4 Process connections

1/2" NPT in flow fitting, connected with optional flange adapters to the actual installation.

Note: The ISC40 sensor type -GG and -TG are supplied with a Viton gasket. This gasket may be used with the older series of ISC40FF fittings. It should be discarded when the sensor is mounted in combination with the ISC40FF type -PA and -FA.

10.2 Installation of ISC40 sensor in ISC40FF

Installation of the flow fittings involves two steps (see Fig 18):

- Installation of the sensor

The sensor has to be mounted in the flow fitting. It is important that the position of the sensor in the fitting allows easy flow through the hole of the sensor donut. Generally good flow is assured if the flats of the sensor are oriented perpendicular to the outlet piping. It is also important that the sample piping is oriented in such a way that the direction of the flow is upwards to assure complete filling of the flow chamber

- Installation of the fitting on wall, railing or stanchion

For this purpose the flow fitting has an optional pipe/wall mounting kit /MS or /MP (see Fig 19 for details). This kit consists of a clamp ring with bolts and nuts which clamps around the flow chamber. Therefore the flow chamber can be turned in the mounting assembly allowing more flexibility in installation. The mounting plate can be mounted on a wall or panel with 2-4 anchor bolts with a diameter of 10 mm (3/8") max. For those installations where pipe mounting is requested (2" nominal pipe), either horizontal or vertical, a saddle and U-bolt have to be used.

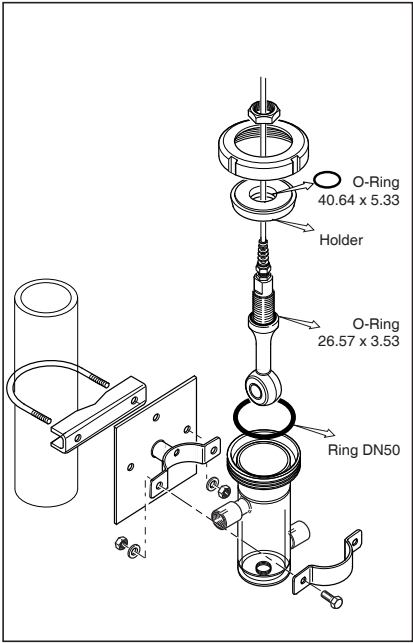


Fig 18: Installation of ISC40 sensor in flow fitting

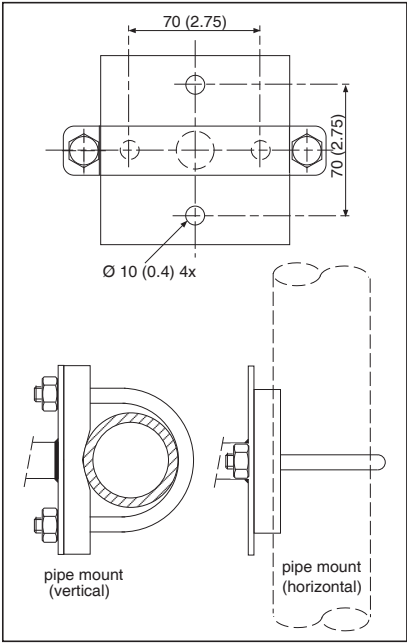


Fig 19: Pipe/wall mounting kit

Note: The ISC40 sensor type -TG does not fit in the model ISC40FF-S.

10.3 Dimensions ISC40FF

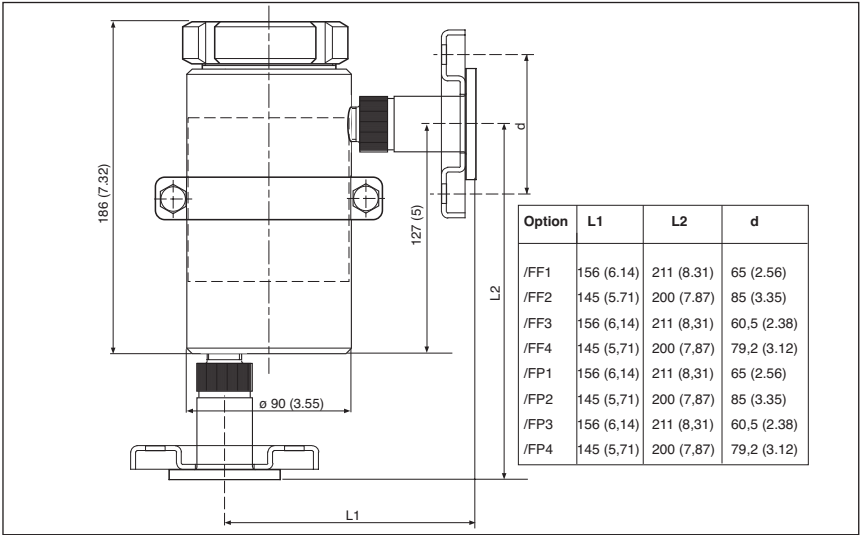


Fig 20: Flow fitting ISC40FF-P, ISC40FF-F

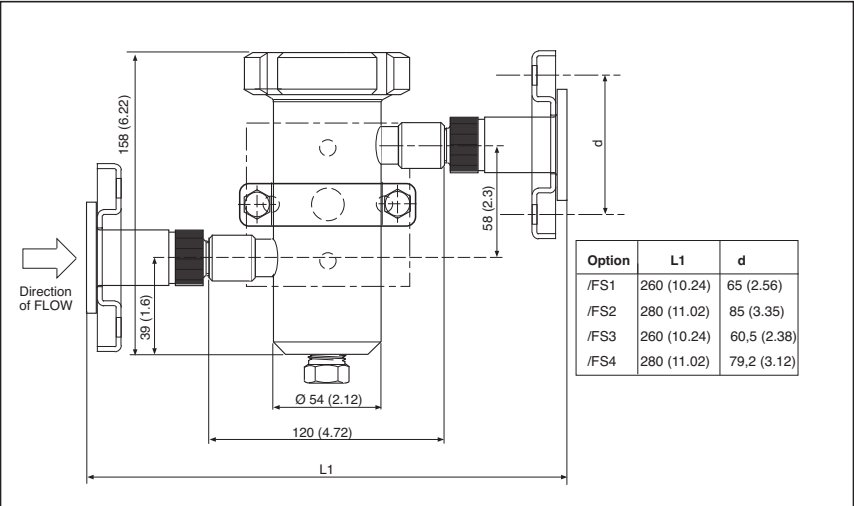


Fig 21: Flow fitting ISC40FF-S

10.4 Modelcode ISC40FF

Model	Suffix	Option	Description
ISC40FF			flow fitting
Material	-S -P -F		AlSi 316 stainless steel Polypropylene (PP) PVDF (KYNAR®)
Process connection	-A		NPT
1/2"NPT Flange adapters		/FF1 /FF2 /FF3 /FF4 /FP1 /FP2 /FP3 /FP4 /FS1 /FS2 /FS3 /FS4	PVDF, DN15 PN10 PVDF, DN25 PN10 PVDF, ANSI 1/2"-150lbs PVDF, ANSI 1"-150lbs PP, DN15 PN10 PP, DN25 PN10 PP, ANSI 1/2"-150lbs PP, ANSI 1"-150lbs AlSi 316 SS, DN15 PN10 AlSi 316 SS, DN25 PN10 AlSi 316 SS, ANSI 1/2"- 150lbs AlSi 316 SS, ANSI 1"- 150lbs
Mounting set		/MS /MP	Wall/pipe for SS flow fitting Wall/pipe for PP or PVDF flow fitting
Material certificate		/M	3.1. according EN 10024 (for wetted metal parts only)

10.5 Spareparts ISC40FF

Options ISC40FF Flow fitting, flange adapters				
Part no.	Description	Process connection	Material	O-ring(s)
K1521AL	/FF1	DN15 PN10	PVDF	Viton
K1521AP	/FF2	DN25 PN10	PVDF	Viton
K1521AE	/FF3	ANSI ½" – 150 lbs	PVDF	Viton
K1521AH	/FF4	ANSI 1" – 150 lbs	PVDF	Viton
K1521AM	/FP1	DN15 PN10	PP	Viton
K1521AQ	/FP2	DN25 PN10	PP	Viton
K1521AF	/FP3	ANSI ½" – 150 lbs	PP	Viton
K1521AJ	/FP4	ANSI 1" – 150 lbs	PP	Viton
K1521AK	/FS1	DN15 PN10	AlSi 316 SS	Viton
K1521AN	/FS2	DN25 PN10	AlSi 316 SS	Viton
K1521AD	/FS3	ANSI ½" – 150 lbs	AlSi 316 SS	Viton
K1521AG	/FS4	ANSI 1" – 150 lbs	AlSi 316 SS	Viton

Note: Other O-ring materials are available as sparepart

Parts ISC40FF Flow fitting				
Part no.	Description	Dimensions	Material	O-ring
K1541KD	Holder + O-rings	2"	PVDF	Viton
K1541KL	Holder + O-rings	2"	Polypropylene	Viton
K1541KA	Holder + O-rings	2"	AlSi 316 SS	Viton

Note: Other O-ring materials are available as sparepart

O-rings ISC40FF Flow fitting				
Part no.	Description	Dimensions	Material	Quantity
O-rings -SA				
K1500DB	O-ring set	40.64 x 5.33; 26.57 x 3.53; Ring DN50	EPDM	5 sets
K1500DA	O-ring set	40.64 x 5.33; 26.57 x 3.53; Ring DN50	Viton	5 sets
K1500DC	O-ring set	40.64 x 5.33; 26.57 x 3.53; Ring DN50	Silicon	5 sets
K1500CD	O-ring	40.64 x 5.33	Kalrez	1
K1500CH	O-ring	26.57 x 3.53	Kalrez	1
K1500DD	O-ring	53.34 x 5.33	Kalrez	1
O-rings -PA, -FA				
K1500DF	O-ring set	40.64 x 5.33; 26.57 x 3.53; 56.52 x 5.33	EPDM	5 sets
K1500DE	O-ring set	40.64 x 5.33; 26.57 x 3.53; 56.52 x 5.33	Viton	5 sets
K1500DG	O-ring set	40.64 x 5.33; 26.57 x 3.53; 56.52 x 5.33	Silicon	5 sets
K1500CD	O-ring	40.64 x 5.33	Kalrez	1
K1500CH	O-ring	26.57 x 3.53	Kalrez	1
K1500DH	O-ring	56.52 x 5.33	Kalrez	1

Note: O-ring 53.34 x 5.33 (K1500DD) is used as a Kalrez replacement for the Ring DN50.

11 ISC40FD – IMMERSION FITTING

11.1 General Specifications

11.1.1 Materials

Wetted parts without options

Model ISC40FD-S	: AISI 316 SS, Viton
Model ISC40FD-V	: C-PVC, Viton
Flange ISC40FD-S-**-SF*	: AISI 316 SS

Non-wetted parts

Tube pigtail	: plastic
--------------	-----------

11.1.2 Operating range

Temperature

Model ISC40FD-S	: Max. 150°C (302°F)
Model ISC40FD-V	: Max. 80°C (176°F)

Pressure

Model ISC40FD-S	: Max. 10 bar (150 PSI) at operating temperature
Model ISC40FD-V	: Max. 2 bar (30 PSI) at 20°C (68°F) Max. 1 bar (15 PSI) at 80°C (176°F)

11.1.3 Process connections

Flange AISI 316 SS 2" or AISI 316 SS DN50, for the type -V an adjustable optional flange is available with ANSI 2" 150 lbs and DN50 PN10 hole pattern.

Note: The ISC40 sensor type -GG and -TG are supplied with a Viton gasket. This gasket may be used with the older series of ISC40FD fittings. It should be discarded when the sensor is mounted in combination with the ISC40FD type -S and -V.

11.2 Installation of ISC40 sensor in ISC40FD

Installation of the immersion fittings involves two steps:

- Installation of the sensor
The sensor has to be mounted in the immersion fitting (see Fig 22).
- Installation in the application
 - o On a railing or stanchion
For this purpose the immersion fitting has an optional rail mounting kit /MS1. This kit consists of a piece of guide pipe and two pipe clamps. The guide pipe is mounted horizontally to the stanchion using one pipe clamp. The second pipe clamp connects the guide pipe to the immersion fitting. The distance between the pipe clamps determines the distance between the stanchion and immersion fitting (see Fig 23).
 - o With flange
For this purpose a stainless steel immersion fitting can be ordered as type -SFD (DN50) or type -SFA (2"). The PVC immersion fitting has an optional depth adjustable mounting flange /FA (with DN50 PN10 and ANSI 2" 150 lbs hole pattern) which is illustrated in Fig 24. You must assure that the mating flange has the same hole pattern as the supplied flange.

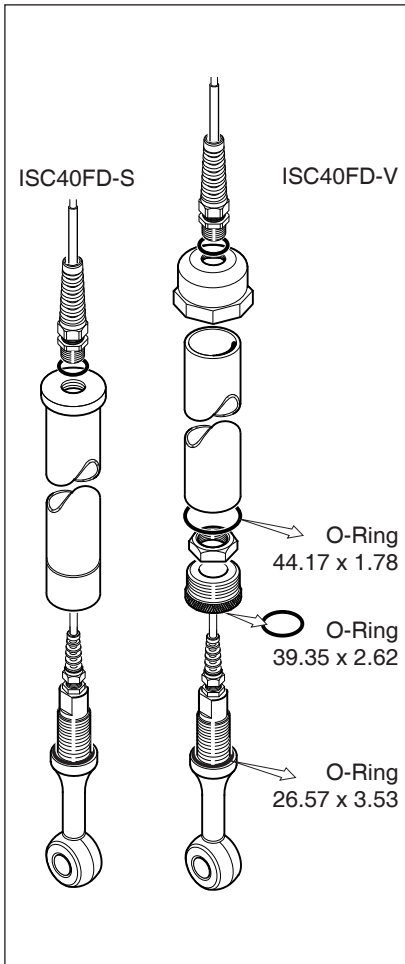


Fig 22: Installation of ISC40 sensor in immersion fitting.

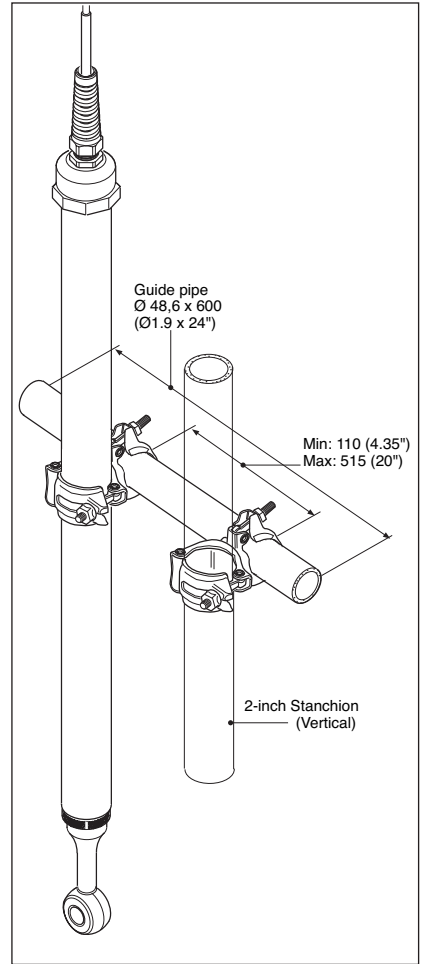


Fig 23: Installation on stanchion with /MS1

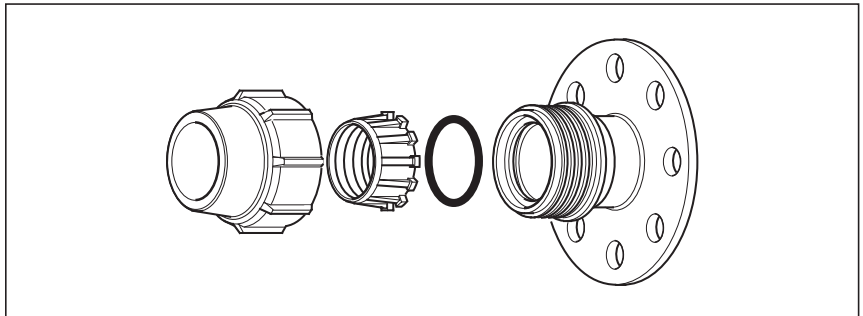


Fig 24: Option /FA

Alternative ways of mounting the immersion fitting are:

- Guide pipe

To facilitate this type of mounting the immersion fitting has a larger diameter at the top. The user supplied guide pipe (internal diameter > 52 mm) is fitted to the wall or mounting rail. The immersion fitting slides into this guide pipe and therefore the sensor can be easily removed for inspection.

- Platform mounting

Sometimes there is a walking platform that can be used to mount the immersion fitting. The top of the immersion fitting has a larger diameter than the shaft. The only thing to do is to drill a precise hole in the platform to slide the fitting through.

11.3 Dimensions ISC40FD

Dimensions in mm (inches)

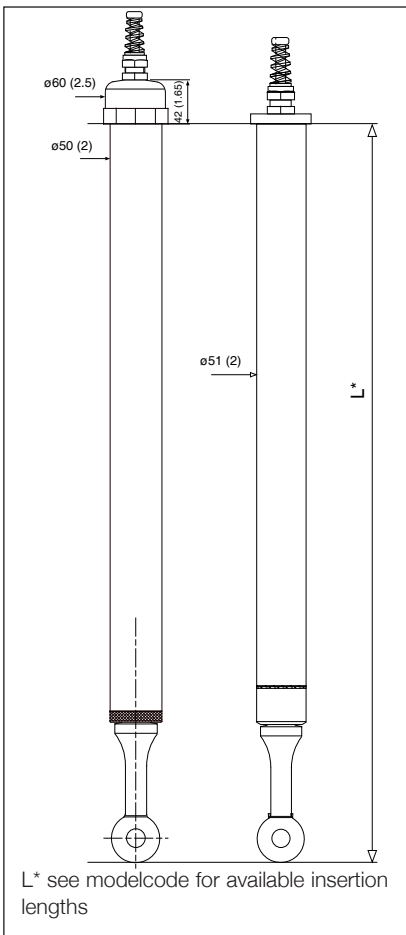
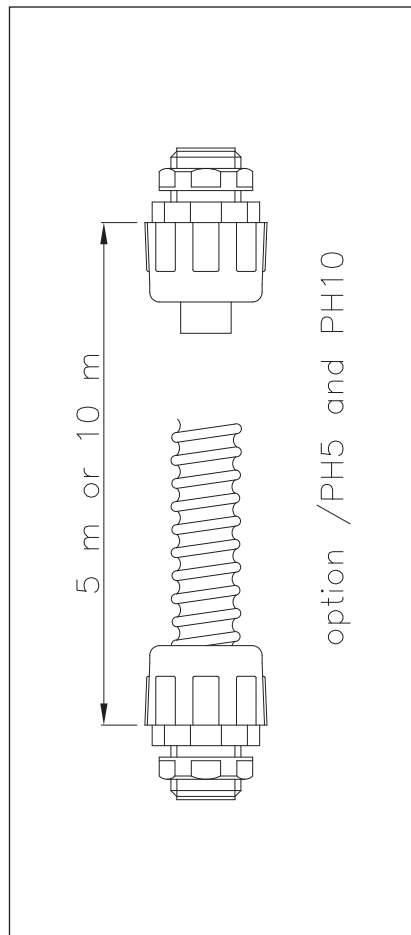


Fig 25: Immersion fitting ISC40FD



**Fig 26: Protection hose,
option /PH5, /PH10**

11.4 Modelcode ISC40FD

Model code	Suffix code	Option code	Description
ISC40FD			Immersion fitting
Material	-S -V		AISI 316 Stainless steel PVC-C
Insertion length	- □ □		Between 05 to 20 Example: 05 = 0.5 m / 20 = 2.0 m
Flange	-NFL -SFA -SFD		No flange AISI316 SS 2" AISI316 SS DN50
Options		/MS1 /FA /PH5 /PH10	Pipe mounting set (Carbon steel) Adjustable flange with DIN DN50-PN10 and ANSI 2" 150 lbs hole pattern (only for PVC) Protection hose for 5 m cable Protection hose for 10 m cable
Material certificate		/M	3.1. according EN 10204 (for wetted metal parts only)

Note: option /FA only for ISC40FD-V; option /M only for ISC4FD-S

11.5 Spareparts ISC40FD

Options ISC40FD Flow fitting				
Part no.	Description	Process connection	Material	
K1541ZY	/MS1		Carbon steel	
K1520EV	/FA	DN50 PN10; ANSI 2" lbs	PP	
K1500CJ	/PH5		PVC, PA6.6	
K1500CK	/PH10		PVC, PA 6.6	
O-rings ISC40FD Immersion fitting				
Part no.	Description	Dimensions	Material	Quantity
O-rings -S				
K1500CE	O-ring set	39.35 x 2.62; 26.57 x 3.53	EPDM	5 sets
K1500CF	O-ring set	39.35 x 2.62; 26.57 x 3.53	Viton	5 sets
K1500CG	O-ring set	39.35 x 2.62; 26.57 x 3.53	Silicon	5 sets
K1500CV	O-ring	39.35 x 2.62	Kalrez	1
K1500CH	O-ring	26.57 x 3.53	Kalrez	1
O-rings -V				
K1500CX	O-ring set	39.35 x 2.62; 26.57 x 3.53; 44.17 x 1.78	EPDM	5 sets
K1500CW	O-ring set	39.35 x 2.62; 26.57 x 3.53; 44.17 x 1.78	Viton	5 sets
K1500CY	O-ring set	39.35 x 2.62; 26.57 x 3.53; 44.17 x 1.78	Silicon	5 sets

12 Chemical Compatibility Chart

			Material							
			PVDF (Kynar)	S.S. 316	VITON	PEEK	PP	PVC	PFA	
			Temp. % Conc. °C 20 80 100	20 80 100	20 80 100	20 80 100	20 80	20 80	20 80 100	
Inorganic acid	Sulfuric acid	10	0 0 0	X X X	0 0 0	0 0 0	0 0	0 X	0 0 0	
		50	0 0 0	X X X	0 0 0	0 0 X	0 0	0 0	0 0 0	
		95	0 X -	X X X	0 0 0	- - -	X -	X X	0 0 0	
		fuming	- - -	- - -	0 0 0	- - -	- -	- -	0 0 0	
	Hydrochloric acid	10	0 0 0	- - -	0 0 0	0 0 X	0 0	0 X	0 0 0	
		sat.	0 0 0	- - -		0 0 X	0 0	0 0	0 0 0	
	Nitric acid	25	0 0 X	X X X	0 0 X	0 0 0	0 0	0 X	0 0 0	
		50	0 0 X	X X X	- - -	X X X	X -	0 X	0 0 0	
		95	0 X -	0 0 0	- - -	- - -	- -	- -	0 0 0	
		fuming	- - -	0 0 0	- - -	- - -	- -	- -	0 0 0	
	Phosphoric acid	25	0 0 0	- - -	0 0 0	0 0 0	0 0	0 X	0 0 0	
		50	0 0 0	X X X	0 0 0	0 0 0	0 0	0 0	0 0 0	
95		0 0 0	0 0 0	X X -	0 0 0	0 0	0 0	0 0 0		
Hydrofluoric acid	40	0 0 0	- - -	0 0 0	- - -	0 0	0 X	0 0 0		
	75	0 0 0	- - -	0 0 0	- - -	0 0	X X	0 0 0		
Organic acid	Acetic acid	10	0 0 0	0 0 X	- - -	0 0 0	0 0	0 X	0 0 0	
		glacial	0 X -	0 0 X	- - -	0 0 X	0 X	X X	0 0 0	
	Formic acid	80	0 0 0	X X X	- - -	X X X	0 0	0 -	0 0 X	
Alkali	Citric acid	50	0 0 0	0 0 0	0 0 0	0 0 0	0 0	0 0	0 0 0	
	Calcium hydroxide	sat.	0 0 0	0 0 0	0 0 0	0 0 0	0 0	0 0	0 0 0	
	Potassium hydroxide	50	0 0 X	0 0 0	0 0 0	0 0 0	0 0	0 0	0 0 0	
	Sodium hydroxide	40	0 0 X	0 0 0	X X X	0 0 0	0 0	0 X	0 0 0	
	Ammonia in water	30	0 0 0	0 0 0	X X X	0 0 0	0 0	0 X	0 0 0	
Acid salt	Ammonium chloride	sat.	0 0 0	X X X	0 0 0	0 0 0	0 0	0 0	0 0 0	
	Zinc chloride	50	0 0 0	X X X	0 0 0	0 0 0	0 0	0 0	0 0 0	
	Iron (III) chloride	50	0 0 0	- - -	0 0 0	0 0 0	0 0	0 0	0 0 0	
Basic salt	Sodium sulfite	sat.	0 0 0	0 0 0	- - -	0 0 0	0 0	0 0	0 0 0	
	Sodium carbonate	sat.	0 0 0	0 0 0	0 0 0	0 0 0	0 0	0 0	0 0 0	
Neutral salt	Potassium chloride	sat.	0 0 0	X X X	0 0 0	0 0 0	0 0	0 0	0 0 0	
	Sodium sulfate	sat.	0 0 0	0 0 0	0 0 0	0 0 0	0 0	0 0	0 0 0	
	Calcium chloride	sat.	0 0 0	X X X	0 0 0	0 0 0	0 0	0 0	0 0 0	
	Sodium chloride	sat.	0 0 0	X X X	0 0 0	0 0 0	0 0	0 0	0 0 0	
	Sodium nitrate	50	0 0 0	X X X	0 0 0	0 0 0	0 0	0 0	0 0 0	
	Aluminium chloride	sat.	0 0 0	- - -	0 0 0	0 0 0	0 0	0 0	0 0 0	
Oxidizing agent	Hydrogen peroxide	30	0 0 0	0 0 0	0 0 0	0 0 0	0 0	0 0	0 0 0	
	Sodium hypochloride	50	0 0 0	X X X	0 0 X	0 0 0	X X	X X	0 0 0	
	Potassium dichromate	sat.	0 0 0	0 0 0	0 0 0	0 0 0	0 0	0 0	0 0 0	
	Chlorinated lime		0 X -	X X X		X X X	- -	0 0	0 0 0	
Organic solvent	Ethanol	80	0 0 X	0 0 0	X - -	0 0 0	0 0	0 X	0 0 0	
	Cyclohexane		0 0 X	0 0 0	0 0 0	0 0 0	- -	0 0	0 0 0	
	Toluene		0 0 0	0 0 0	- - -	0 0 0	X -	- -	0 0 0	
	Trichloroethane		X X X	0 0 X	X X X	0 0 0	- -	- -	0 0 0	
	Water		0 0 0	0 0 0	0 0 0	0 0 0	0 0	0 0	0 0 0	

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.

O = can be used, X = shortens useful life, - = cannot be used

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