

Type S030

INLINE fitting



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1 About this document

The document is an important part of the product and guides the user to safe installation and operation. The information and instructions in this document are binding for the use of the product.

- ▶ Before using the product for the first time, read and observe the whole safety chapter.
- ▶ Before starting any work on the product, read and observe the respective sections of the document.
- ▶ Keep the document available for reference and give it to the next user.
- ▶ Contact the Burkert sales office for any questions.



Further information concerning the product at [Products](#).

- ▶ Enter the article number from the type label in the search bar.

The illustrations in these instructions may vary depending on the product variant.

1.1 Symbols



DANGER!

Warns of a danger that leads to death or serious injuries.



WARNING!

Warns of a danger that can lead to death or serious injuries.



CAUTION!

Warns of a danger that can lead to minor injuries.

NOTICE!

Warns of property damage on the product or the installation.



Indicates important additional information, tips and recommendations.



Refers to information in this document or in other documents.

- ▶ Indicates a step to be carried out.

- ✓ Indicates a result.

Menu Indicates a software user-interface text.

1.2 Terms and abbreviations

Product	Type S030 fitting
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1.3 Manufacturer

Bürkert SAS

20, rue du Giessen

67220 TRIEMBACH-AU VAL

FRANCE

The contact addresses are available at [Contact](#).



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2 Safety

2.1 Intended use

Use of the product that does not comply with the instructions could present risks to people, nearby installations and the environment.

The fitting type S030 is intended to measure the flow rate of clean fluids in pipes. The fitting type S030 can be combined with a flow transmitter or a flow indicator, fitted with a bajonet connection.

- ▶ Use the product in compliance with the characteristics and commissioning and use conditions specified in the contractual documents, in the Operating Instructions of the product and in the Operating Instructions of the combined instrument.
- ▶ Use the product only in combination foreign devices or foreign components recommended or approved by Bürkert.
- ▶ Store, transport, install and operate the product properly.
- ▶ Only operate a product in perfect working order.
- ▶ Only use the product as intended.

2.2 Safety instructions

This safety information does not take into account any contingencies or occurrences that may arise during installation, use and maintenance of the product.

The local safety regulations for which the operating company is responsible including the staff in charge of installation and maintenance.

Risk of injury due to high pressure in the installation

- ▶ Before any intervention on the installation, stop the circulation of fluid, cut off the pressure and drain the pipe.
- ▶ Observe the fluid temperature-pressure dependency depending of the product used.

Risk of burn injury due to high fluid temperatures

- ▶ Do not touch with bare hands the parts of the product that are in contact with the fluid.
- ▶ Before opening the pipe, stop the circulation of fluid and drain the pipe.

Risk of injury due to the nature of the fluid.

- ▶ Respect the prevailing regulations on accident prevention and safety relating to the use of dangerous fluids.

Various dangerous situations

- ▶ Do not use the fittings in PVC or PP in explosive atmospheres.
- ▶ Do not use the product in an environment incompatible with the materials it is made of.
- ▶ Do not subject the product to mechanical loads.
- ▶ Do not make any modifications to the product.
- ▶ Prevent any unintentional power supply switch-on.

- ▶ Only qualified and skilled staff can carry out the installation and maintenance work.
- ▶ Guarantee a defined or controlled restarting of the process, after a power supply interruption.
- ▶ Observe the general technical rules.

The product may be damaged by the fluid in contact with

- ▶ Systematically check the chemical compatibility of the component materials of the product and the fluids likely to come into contact with them (for example: alcohols, strong or concentrated acids, aldehydes, alkaline compounds, esters, aliphatic compounds, ketones, halogenated aromatics or hydrocarbons, oxidants and chlorinated agents).

3 Operating principle

The fluid flowing in the piping makes the paddle-wheel turn. The paddle-wheel rotational frequency f is proportional to the flow rate.

4 Technical data

4.1 Standards and directives

This product complies with the legal requirements applicable at the time of placing on the market and has been developed and tested in accordance with the relevant European directives/regulations and harmonized standards. The conformity is documented and, if necessary, supported by evidence. The EU Declaration of Conformity can be found behind the respective type on the home page country.burkert.com

4.2 Conditions of use

 The fluid temperature and the fluid pressure may be restricted by the associated transmitter or indicator: refer to the related Operating Instructions.

Ambient temperature (operating)	depends on the combined transmitter or indicator. Refer to the related Operating Instructions.
Pressure class	PN16 (or PN40 on request) for metal fittings. PN10 for plastic fittings, depends on fluid temperature, see following diagram.
Pressure class	depends on the materials the fitting body and the paddle-wheel are made, see following table

Paddle-wheel material	Fitting body material	Fluid temperature
PP	<ul style="list-style-type: none">• Stainless steel• Brass• PVDF• PP	+0...+80 °C
	<ul style="list-style-type: none">• PVC	+0...+50 °C
PVDF	<ul style="list-style-type: none">• Stainless steel• Brass• PVDF	-15...+100 °C
	<ul style="list-style-type: none">• PP	+0...+80 °C
	<ul style="list-style-type: none">• PVC	+0...+80 °C

Tab. 1: Fluid temperature depending on the product materials

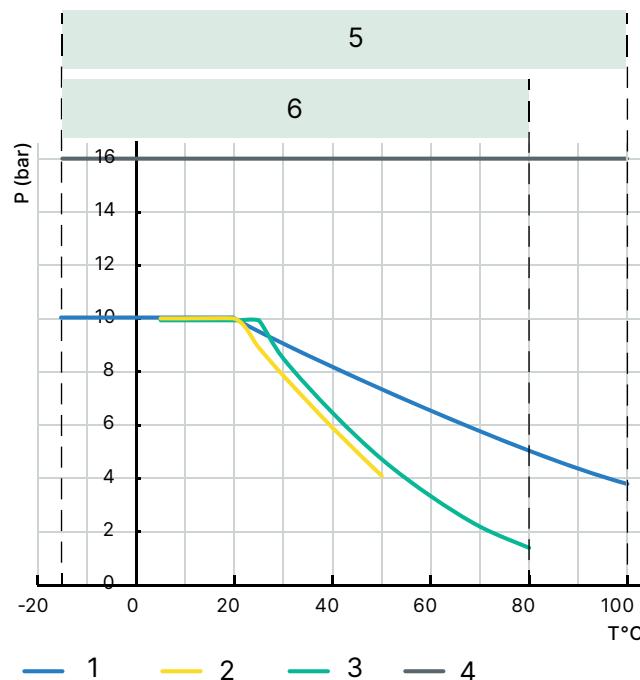


Fig. 1: Fluid pressure-temperature dependency curves for fittings used on their own

1 PVDF	2 PVC
3 PP	4 Metal
5 Application range for complete device (sensor-fitting Type S030 + transmitter Type SE30, SE32, SE35, SE36 or 8611)	6 Application range for complete device (sensor-fitting Type S030 + transmitter Type SE30 Ex)

Paddle-wheel material	Body fitting material	Storage temperature
PP	<ul style="list-style-type: none"> • Stainless steel • Brass • PVDF • PP 	-15...+80 °C
PVDF	<ul style="list-style-type: none"> • PVC 	-15...+60 °C
	<ul style="list-style-type: none"> • Stainless steel • Brass • PVDF 	-15...+100 °C
	<ul style="list-style-type: none"> • PP 	-15...+80 °C
	<ul style="list-style-type: none"> • PVC 	-15...+60 °C

Tab. 2: Storage temperatures

4.3 Conformity to the pressure equipment directive

- ▶ Make sure the product materials are compatible with the fluid.
- ▶ Make sure that the pipe DN is adapted for the product.
- ▶ Observe the fluid nominal pressure (PN) for the product. The nominal pressure (PN) is given by the product manufacturer.

The product conforms to Article 4, Paragraph 1 of the Pressure Equipment Directive 2014/68/EU under the following conditions:

Product used on a pipe

(PS = maximum admissible pressure, in bar; DN = nominal dimension of the pipe)

Type of fluid	Conditions
Fluid group 1, Article 4, Paragraph 1.c.i	DN ≤ 25
Fluid group 2, Article 4, Paragraph 1.c.i	DN ≤ 32 or PSxDN ≤ 1000
Fluid group 1, Article 4, Paragraph 1.c.ii	DN ≤ 25 or PSxDN ≤ 2000
Fluid group 2, Article 4, Paragraph 1.c.ii	DN ≤ 200 or PS ≤ 10 or PSxDN ≤ 5000

4.4 Fluid data

Maximum fluid viscosity	300 cSt
Type of fluid	Clean, neutral or slightly aggressive liquids
Rate of solid particles in the fluid	max. 1 %
Maximum particle size	0.5 mm

4.5 General data

Flow rate measurement

Measurement range	0.3...10 m/s
Measurement deviation with standard K factor	$\pm 2.5\%$ of the measured value ¹⁾
Measurement deviation with K factor determined with a Teach-in procedure	$\pm 1\%$ of the measured value ¹⁾ (at the flow rate value the Teach-in has been made)
Linearity	$\pm 0.5\%$ of the full scale ¹⁾
Repeatability	$\pm 0.4\%$ of the measured value ¹⁾

4.6 Materials

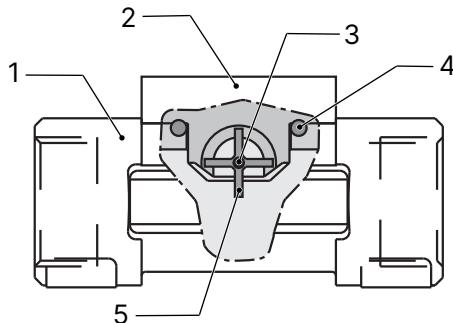


Fig. 2: Sectional drawing of the S030 fitting

1 Body	2 Sensor holder
3 Axis	4 Seal
5 Paddle-wheel	

Component	Material
Seal	FKM EPDM with FDA agreement on request
Body	Stainless steel (316L - 1.4404) Brass (CuZn39Pb2) PVC, PP, PVDF
Screws	Stainless steel (316L - 1.4404)
Paddle-wheel	PVDF PP on request
Shaft and bearings	Ceramics (Al_2O_3)

¹⁾ Determined in the following reference conditions: medium = water, water and ambient temperatures 20 °C, minimum upstream and downstream distances respected, appropriate pipe dimensions.

4.7 Dimensions

Please refer to the technical data sheets regarding the product type S030, available at:
country.burkert.com

4.8 K factors (pulse/litre)

The K factors have all been determined under the following reference conditions: fluid = water, water and room temperatures of 20 °C, minimum upstream and downstream distances respected, appropriate pipe dimensions.

If the S030 fitting is combined with a flow transmitter or a flow indicator that does not automatically convert the K factors, make the conversion using one of the following formulae:

- K factor in pulse/US gallon = K factor in pulse/litre x 3.785 to obtain a flow rate value in US gallon/time unit
- K factor in pulse/UK gallon = K factor in pulse/litre x 4.546 to obtain a flow rate value in UK gallon/time unit

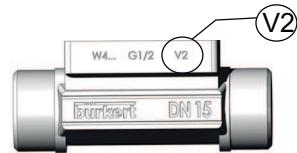
Some S030 fittings in DN15 and DN20 exist in 2 versions with different K factors.

If a version 2 exists, only version 2 is available from March 2012. The version-2 fitting have a "v2" marking that can be found:

on the bottom of the DN15 or DN20 fitting in plastic



on the side of the DN15 or DN20 fitting in metal



 The names of the following norms have changed in the Operating Instructions:

- ▶ for the welding ends, norm BS 4825 is renamed BS 4825-1.
- ▶ for the clamp connections, norm BS 4825 is renamed BS 4825-3.
- ▶ for the flange connections, norm EN 1092-1 (ISO PN16) is renamed EN 1092-1 / B1 / PN16.

- ▶ The norm ISO for clamp connections is replaced through the norm DIN 32676 series B.
- ▶ The norm DIN 32676 series A for clamp connections is added.

Material	Type of connection and standard	K factor [Pulse/litre]					
		DN6	DN8	DN15	DN15 v2	DN20	DN20 v2
Stainless steel	Welding ends acc. to:						
	SMS 3008	-	-	-	-	-	-
	DIN 11866 series C / BS 4825-1 / ASME BPE	-	-	-	-	106	74,5
	DIN 11850 series 2 / DIN 11866 series A / EN 10357 series A	-	278	106	74,5	106	74,5
	DIN 11866 series B / ISO 1127 / ISO 4200	-	-	106	74,5	66,5	-
Stainless steel	External threads acc. to:						
	SMS 1145	-	-	-	-	-	-
	G	440	278	106	74,5	66,5	-
Stainless steel	Internal threads acc. to:						
	G, Rc, NPT	-	-	106	74,5	66,5	-
Stainless steel	Clamp acc. to:						
	SMS 3017	-	-	-	-	-	-
	BS 4825-3 / ASME BPE	-	-	-	-	106	74,5
	DIN 32676 series A	-	278	106	74,5	106	74,5
	DIN 32676 series B	-	-	106	74,5	66,5	-
Stainless steel	Flanges acc. to:						
	EN 1092-1 / B1 / PN16	440	-	106	74,5	66,5	-
	ANSI B16-5						
	JIS 10K						
Brass	All	440	278	106	74,5	66,5	-
PVC	All	440	278	116	84,7	75,3	-
PP	All	-	-	110	89,9	74,2	-
PVDF	All	440	278	118	90,3	78	-

Material	Type of connection and standard	K factor [Pulse/litre]				
		DN25	DN32	DN40	DN50	DN65
Stainless steel	Welding ends acc. to:					
	SMS 3008	66,9	-	31,1	19,9	11,4
	DIN 11866 series C / BS 4825-1 / ASME BPE	66,9	49,0	31,1	19,9	11,4
	DIN 11850 series 2 / DIN 11866 series A / EN 10357 series A	66,9	49,0	31,1	19,9	-
	DIN 11866 series B / ISO 1127 / ISO 4200	49,0	31,8	19,8	11,4	-
Stainless steel	External threads acc. to:					
	SMS 1145	66,9	-	31,1	19,9	-
	G	49,0	31,8	19,8	11,4	-
Stainless steel	Internal threads acc. to:					
	G, Rc, NPT	49,0	31,8	19,8	11,4	-
Stainless steel	Clamp acc. to:					
	SMS 3017	66,9	-	31,1	19,9	11,4
	BS 4825-3 / ASME BPE	66,9	-	31,1	19,9	11,4
	DIN 32676 series A	66,9	-	31,1	19,9	-
	DIN 32676 series B	49,0	31,8	19,8	11,4	-
Stainless steel	Flanges acc. to:					
	EN 1092-1 / B1 / PN16	49,0	31,8	19,8	11,4	-
	ANSI B16-5					
	JIS 10K					
Brass	All	49,0	31,8	19,8	11,4	-
PVC	All	52,9	28,5	17,3	10,2	-
PP	All	52,9	28,4	17,4	10,1	-
PVDF	All	57,20	31,7	19,0	10,9	-

5 Installation and commissioning

5.1 Safety instructions

DANGER!

Risk of injury due to high pressure in the installation.

- ▶ Stop the circulation of fluid, cut off the pressure and drain the pipe before loosening the process connections.

DANGER!

Risk of burn injury due to high fluid temperatures.

- ▶ Do not touch with bare hands the parts of the product that are in contact with the fluid.
- ▶ Stop the circulation of fluid and drain the pipe before loosening the process connections.

DANGER!

Risk of injury due to the nature of the fluid.

- ▶ Respect the prevailing regulations on accident prevention and safety relating to the use of dangerous fluids.

WARNING!

Risk of injury due to non-conforming installation.

- ▶ Fluid installation must only be carried out by qualified and authorised personnel with the appropriate tools.
- ▶ Observe the installation instructions for the combined transmitter or indicator.

WARNING!

Risk of injury due to an uncontrolled restart.

- ▶ Ensure that the restart of the installation is controlled after any interventions on it.

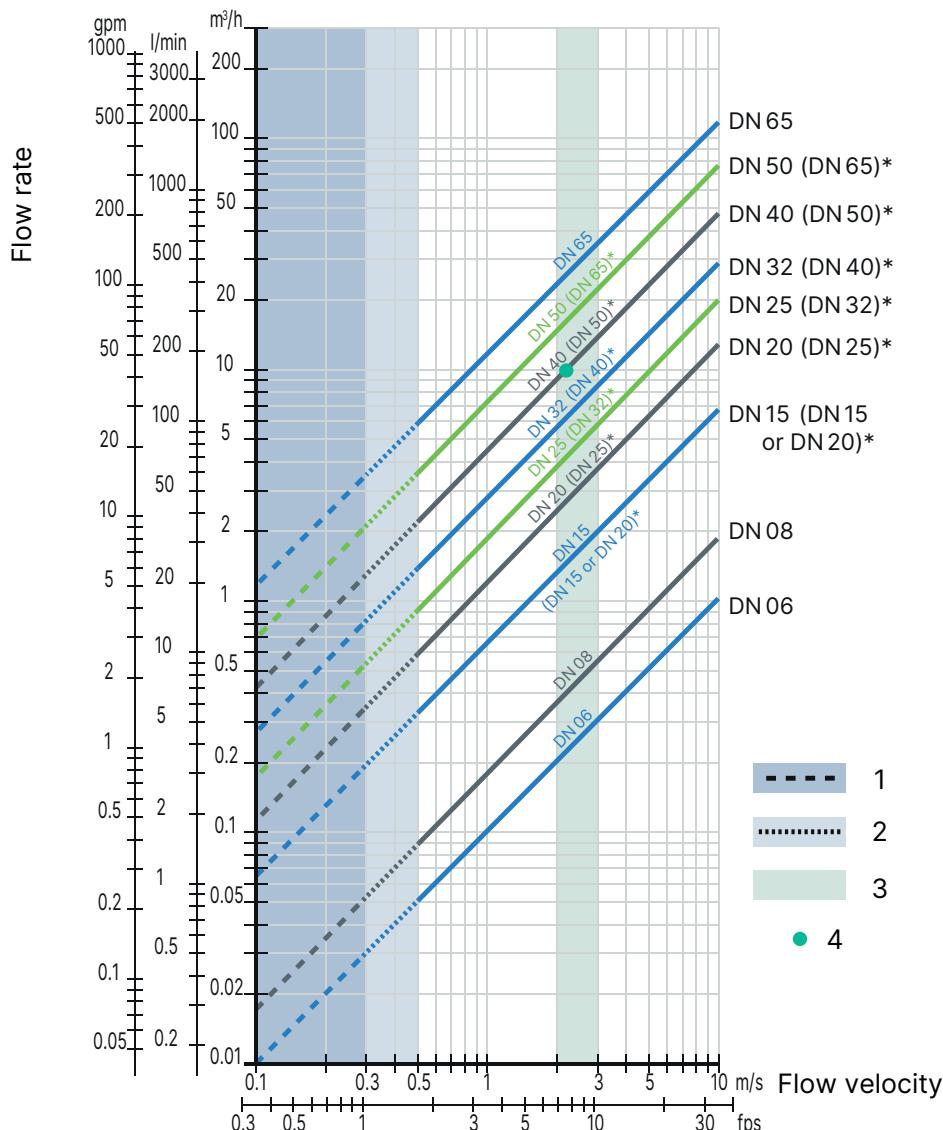
WARNING!

Risk of injury if the fluid pressure / temperature dependency is not respected.

- ▶ Take into account the fluid pressure/ temperature dependency according to the materials from which the fitting is made and to the measuring device used (see the relevant user manual).
- ▶ Comply with the Pressure Directive 2014/68/EU.

- ▶ Select an appropriate fitting regarding to the flow velocity and the flow rate of the fluid in the piping, see the following charts:

The following graph is used to determine the appropriate DN of the pipe and fitting for the application, according to the fluid velocity and the flow rate. On the chart, the intersection of flow velocity and flow rate gives the appropriate diameter.



1 Not recommended Type S030 (standard)

2 Not recommended Type S030 HT

3 Optimal flow rate

4 Diameter of example 1 and example 2

* Note

- For the fittings listed below, the corresponding nominal size in the bracket must be used:
 - External threads according to SMS 1145
 - Weld ends according to SMS 3008, BS4825-1/ASME BPE/DIN 11866 series C or DIN 11850 series 2/DIN 11866 series A/ DIN EN 10357 series A

- Clamp according to SMS 3017, BS 4825-3/ASME BPE or DIN 32676 series A
- For all other fittings, the corresponding nominal diameter without bracket applies.

Example 1

- Nominal flow: 10 m³/h
- Optimal flow rate: 2...3 m/s

Result: Select a pipe size of DN 40

Example 2

With external threads according to SMS 1145

- Nominal flow: 10 m³/h
- Optimal flow rate: 2...3 m/s

Result: Select a pipe size of DN 50

► Install the fitting on the pipe to comply with the upstream and downstream distances defined by standard EN ISO 5167-1

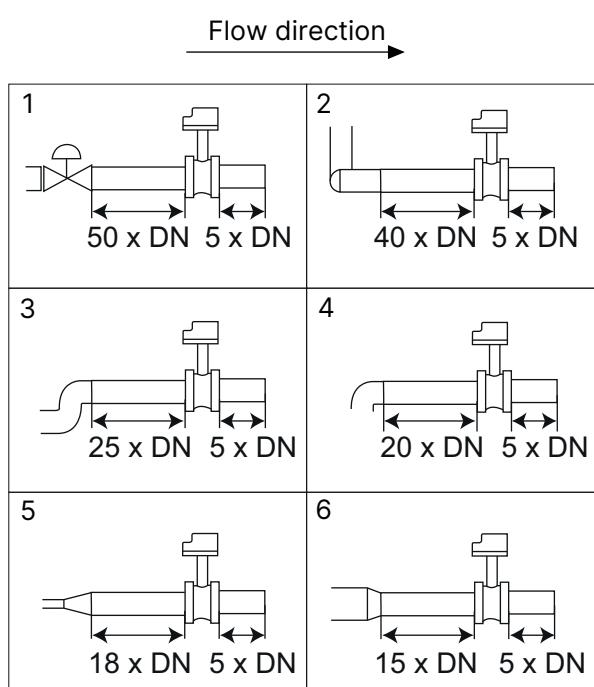


Fig. 3: Upstream and downstream distances depending on the design of the pipes.

1 With regulating valve	2 Pipe with 2 elbows at 90° in 3 dimensions
3 Pipe with 2 elbows at 90°	4 Pipe with 1 elbow at 90° or 1 T-piece
5 With pipe expansion	6 With pipe reduction

► Use a flow conditioner, if necessary, to obtain the best accuracy.
 ► Prevent the formation of air bubbles in the pipe.

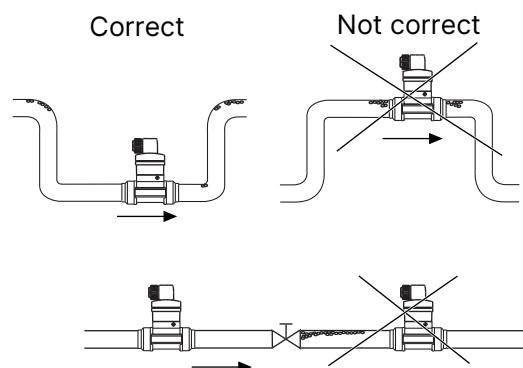


Fig. 4: Additional recommendations on installation

- ▶ Ensure the pipe is always filled with liquid.

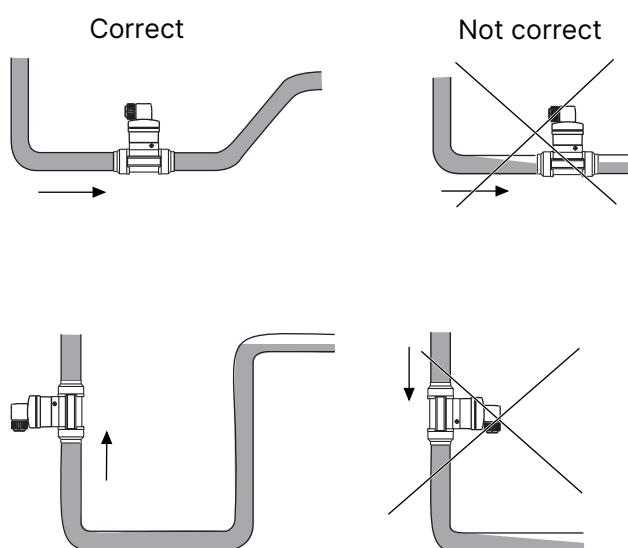


Fig. 5: Additional recommendations on installation

5.2 Installing a fitting with welding ends



Follow the previously described general installation recommendations.

NOTICE!

The seal on the fitting with welding ends may be damaged during welding.

- ▶ Before welding the weld-ends, unscrew the 4 tightening screws.
- ▶ Remove the sensor holder.
- ▶ Remove the seal.
- ▶ Weld the weld-ends.
- ▶ After welding, correctly replace the seal in the groove.
- ▶ Replace the sensor holder.
- ▶ Tighten the 4 screws in an alternating pattern, applying a nominal tightening torque of 1.5 N·m (1.11 lbf·ft).

5.3 Installing a Clamp fitting

NOTICE!

- ▶ Make sure the seals are in good condition.
- ▶ Place seals adapted to the process (temperature, fluid type) in the grooves of the Clamp fitting.
- ▶ Fix the Clamp fitting to the pipe by means of a clamp collar.

5.4 Installing a flange fitting

NOTICE!

- ▶ Make sure the seals are in good condition.
- ▶ Place seals adapted to the process (temperature, fluid type) in the grooves of each connection.

NOTICE!

Make sure the seal remains in the groove while tightening the flange.

- ▶ Tighten the flange to fix the fitting to the pipe.

6 Maintenance

6.1 Safety instructions



DANGER!

Risk of injury due to high pressure in the installation.

- ▶ Stop the circulation of fluid, cut off the pressure and drain the pipe before loosening the process connections.
- ▶ Observe the fluid temperature/pressure dependency depending on the fitting used.



DANGER!

Risk of burns due to high fluid temperatures.

- ▶ Do not touch with bare hands the parts of the product that are in contact with the fluid.
- ▶ Stop the circulation of fluid and drain the pipe before loosening the process connections.



DANGER!

Risk of injury due to the nature of the fluid.

- ▶ Respect the prevailing regulations on accident prevention and safety relating to the use of dangerous fluids.



WARNING!

Risk of injury due to non-conforming maintenance.

- ▶ Maintenance must only be carried out by qualified and skilled staff with the appropriate tools.
- ▶ Ensure that the restart of the installation is controlled after any interventions.

6.2 Cleaning



CAUTION!

The product may be damaged by the cleaning solution.

- ▶ Clean the product with a cloth dampened with water or a detergent compatible with the materials the product is made of.

7 Spare parts and accessories



CAUTION!

Risk of injury and/or damage caused by the use of unsuitable parts.

Incorrect accessories and unsuitable spare parts may cause injuries and damage the product and the surrounding area.

- ▶ Use only original accessories and original spare parts from Burkert.

Certificate	Order code
Inspection certificate 3.1 acc. to EN 10204	803723
Test report 2.2 acc. to EN 10204	803722
Certificate with the surface finish value	804175
3-point calibration certificate (S030 combined with the instrument mounted)	550676
FDA approval	803724

- ▶ For any certificate, contact your Burkert sales subsidiary.

Some S030 fittings in DN15 and DN20 exist in 2 versions with different K factors.

If a version 2 exists, only version 2 is available from March 2012. The version-2 fitting have a "v2" marking that can be found:

on the bottom of the DN15 or DN20 fitting in plastic



on the side of the DN15 or DN20 fitting in metal



Sensor holder in stainless steel	Article number
With PVDF paddle-wheel, FKM seal, screws and certificate, for DN06, DN08, DN15 v2 and DN20 v2	448678
With PVDF paddle-wheel, FKM seal, screws and certificate, for DN15 (except DN15 v2 and DN20 v2) to DN65	432306
With PVDF paddle-wheel, EPDM seal, screws and certificate, for DN15 (except DN15 v2 and DN20 v2) to DN65	432305
With PVDF paddle-wheel, EPDM seal, screws and certificate, internal roughness =0,8 µm for DN15 (except DN15 v2 and DN20 v2) to DN65	434149
With PP paddle-wheel, EPDM seal, screws and certificate, for DN06, DN08, DN15 v2 and DN20 v2	554896
With PP paddle-wheel, EPDM seal, screws and certificate, for DN15 (except DN15 v2 and DN20 v2) to DN65	449425

Sensor holder in brass	Article number
With PVDF paddle-wheel, FKM seal, screws and certificate, for DN06, DN08, DN15 v2 and DN20 v2	448677
With PVDF paddle-wheel, FKM seal, screws and certificate, for DN15 (except DN15 v2 and DN20 v2) to DN65	432304
With PVDF paddle-wheel, EPDM seal, screws and certificate, for DN15 (except DN15 v2 and DN20 v2) to DN65	432303
With PP paddle-wheel, EPDM seal, screws and certificate, for DN15 (except DN15 v2 and DN20 v2) to DN65.	449866
Sensor holder in PVC	Article number
With PVDF paddle-wheel, FKM seal, screws and certificate, for DN06, DN08, DN15 v2 and DN20 v2	448674
With PVDF paddle-wheel, FKM seal, screws and certificate, for DN15 (except DN15 v2 and DN20 v2) to DN65	432298
With PVDF paddle-wheel, EPDM seal, screws and certificate, for DN15 (except DN15 v2 and DN20 v2) to DN65	432297
With PP paddle-wheel, EPDM seal, screws and certificate, for DN15 (except DN15 v2 and DN20 v2) to DN65.	443982
Sensor holder in PP	Article number
With PVDF paddle-wheel, FKM seal, screws and certificate, for DN15 to DN65.	432300
With PVDF paddle-wheel, EPDM seal, screws and certificate, for DN15 to DN65.	432299
With PP paddle-wheel, FKM seal, screws and certificate, for DN15 to DN65.	552881
With PP paddle-wheel, EPDM seal, screws and certificate, for DN15 to DN65.	443983
Sensor holder in PVDF	Article number
With PVDF paddle-wheel, FKM seal, screws and certificate, for DN06, DN08, DN15 v2 and DN20 v2	448676
With PVDF paddle-wheel, FKM seal, screws and certificate, for DN15 (except DN15 v2 and DN20 v2) to DN65	432302
With PVDF paddle-wheel, EPDM seal, screws and certificate, for DN15 (except DN15 v2 and DN20 v2) to DN65	432301
Set of O-rings (DN6 to DN65) for metal fittings	Article number
FKM	426340
EPDM	423341

Set of O-rings in FKM for plastic fittings ²⁾	Article number
DN08	448679
DN15	431555
DN20	431556
DN25	431557
DN32	431558
DN40	431559
DN50	431560

Set of O-rings in EPDM for plastic fittings ²⁾	Article number
DN08	448680
DN15	431561
DN20	431562
DN25	431563
DN32	431564
DN40	431565
DN50	431566

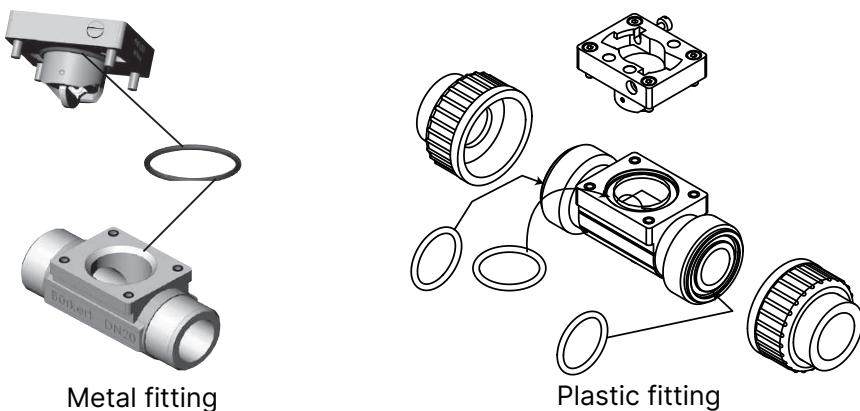


Fig. 6: Position of O-rings in an S030 fitting

²⁾ The O-ring is only intended for fitting body with flat bottom groove. The O-ring is not suitable for fitting body with ribbed groove (old variant).

8 Logistics

8.1 Transport and storage

- ▶ Protect the device against moisture and dirt in the original packaging during transportation and storage.
- ▶ Avoid UV radiation and direct sunlight.
- ▶ Protect connections from damage with protective caps.
- ▶ Observe permitted storage temperature.

8.2 Return



No work or tests will be carried out on the device until a valid Contamination Declaration has been received.

- ▶ To return a used device to Burkert, contact the Burkert sales office. A return number is required.

8.3 Disposal

Environmentally friendly disposal



- ▶ Follow national regulations regarding disposal and the environment.
- ▶ Collect electrical and electronic devices separately and dispose of them as special waste.

Further information at country.burkert.com