

Type S039

INLINE fitting



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Technische Änderungen vorbehalten.
Sous réserve de modifications techniques.

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Operating Instructions 1809/02_EU-ML_00563876 / ORIGINAL_FR

Operating Instructions

Bedienungsanleitung
Manuel d'utilisation

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1. ABOUT THE OPERATING INSTRUCTIONS

The Operating Instructions describe the entire life cycle of the fitting. Please keep the Operating Instructions in a safe place, accessible to all users and any new owners.

The Operating Instructions contain important safety information.

Failure to comply with these instructions can lead to hazardous situations.

- ▶ The Operating Instructions must be read and understood.

Symbols used



DANGER

Warns against an imminent danger.

- ▶ Failure to observe this warning can result in death or in serious injury.



WARNING

Warns against a potentially dangerous situation.

- ▶ Failure to observe this warning can result in serious injury or even death.

ATTENTION

Warns against a possible risk.

- ▶ Failure to observe this warning can result in substantial or minor injuries.

NOTE

Warns against material damage.

- ▶ Failure to observe this warning may result in damage to the fitting or system.



Indicates additional information, advice or important recommendations.



Refers to information contained in these Operating Instructions or in other documents.

→ Indicates a procedure to be carried out.

2. INTENDED USE

Use of fittings S039 that does not comply with the instructions could present risks to people, nearby installations and the environment.

The S039 fitting is intended to measure the flow rate of clean fluids in the piping thanks to its paddle wheel. The fitting S039 can be combined with an electronic module SE39 to build an optical flowmeter 8039.

- ▶ Use this fitting in compliance with the specifications and conditions of commissioning and use given in the contractual documents, in these Operating Instructions and in the Operating Instructions for the device which is inserted into it.
- ▶ Safe and trouble-free operation of the fitting depends on its proper transport, storage and installation, as well as careful operation and maintenance.
- ▶ Only use this fitting as intended.

3. BASIC SAFETY INFORMATION

This safety information does not take into account:

- any contingencies or occurrences that may arise during installation, use and maintenance of the devices.
- the local safety regulations for which the operating company is responsible including the staff in charge of installation and maintenance.



Danger due to high pressure in the installation.
Danger due to high temperatures of the fluid.
Danger due to the nature of the fluid.



Various dangerous situations

- ▶ Prevent any unintentional power supply switch-on.
- ▶ Ensure that installation and maintenance work are carried out by qualified, authorised personnel in possession of the appropriate tools.
- ▶ Guarantee a set or controlled restarting of the process, after a power supply interruption.



Various dangerous situations

- ▶ Observe the general technical rules when installing and using the fitting.
- ▶ Use the fitting only if in perfect working order and in compliance with the instructions provided in the Operating Instructions.
- ▶ Do not use the fitting in explosive atmospheres.
- ▶ Do not use this fitting to measure gas flow rates.
- ▶ Do not use fluid that is incompatible with the materials from which the fitting is made.
- ▶ Do not use this fitting in an environment incompatible with the materials from which it is made.
- ▶ Do not subject the fitting to mechanical loads (by placing objects on top of it or by using it as a step, for example).
- ▶ Do not make any external modifications to the device. Do not paint any part of the fitting.

NOTE

The fitting may be damaged by the fluid in contact with.

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

4. GENERAL INFORMATION

To contact the manufacturer of the device use following address:

Bürkert SAS
 Rue du Giessen
 BP 21
 F-67220 TRIEMBACH-AU-VAL

The addresses of our international branches can be found on the Internet at: www.burkert.com

Warranty conditions

The condition governing the legal warranty is the conforming use of the S039 in observance of the operating conditions specified in the Operating Instructions.

Information on the Internet

You can find the Operating Instructions and technical data sheet regarding the type S039 at: www.burkert.com

5. DESCRIPTION

The S039 fitting is intended to measure the flow rate of clean fluids in DN6 to DN50 pipes thanks to its paddle-wheel. Its combination with an SE39 electronic module builds an 8039 threshold detector.

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

The electronic device can be removed without opening the piping or stopping the process.

6. TECHNICAL DATA

Conditions of use

! The fluid temperatures and pressures may be restricted by the electronic device mounted on the fitting: refer to the related Operating Instructions.

Ambient temperature	Depends on the associated electronic module. Refer to the Operating Instructions of the 8039.
Pressure class	PN10; The fluid pressure may be restricted by the fluid temperature, see Fig. 1.
Fluid temperature	-15 °C to +100 °C

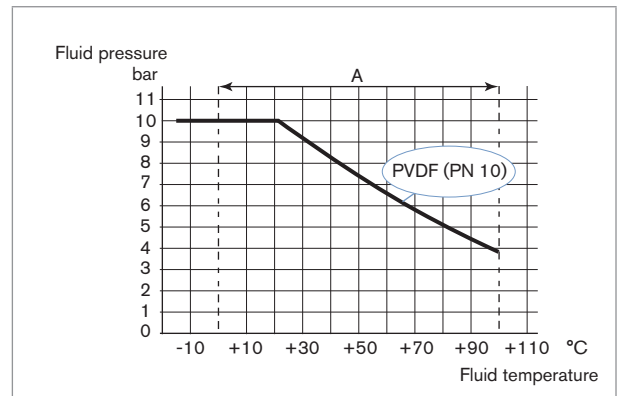


Fig. 1: Fluid pressure / temperature dependency curve for fittings S039 used on their own

Conformity to standards and directives

The applied standards, which verify conformity with the EU directives, can be found on the EU-type examination certificate and/or the EU declaration of conformity (if applicable).

Conformity to the pressure directive

- Make sure the device materials are compatible with the fluid.
- Make sure the pipe DN is adapted for the device.

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

- Device used on a piping (PS = maximum admissible pressure, DN = nominal diamtere 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


General technical data

Max. Fluid viscosity	300 cSt
Type of fluid	Clean, neutral or slightly aggressive
Rate of solid particles in the fluid	max. 1 %
Max. particle size	0.5 mm
Measurement range of the flow rate in the pipe	0.3 to 10 m/s
Measurement deviation	- with standard K-factor: ±3 % of the measured value * - with K-factor determined with a teach-in procedure: ±1% of the measured value * (at the value of the teach-in flow rate)
Linearity	±0.5 % of the full scale (10 m/s)
Repeatability	±0.4 % of the measured value *

* determined in the following reference conditions: medium = water, water and ambient temperatures 20 °C, min. upstream and downstream distances respected, appropriate pipe dimensions.

Diameters available

The diameters available depend on the design of the S039 fitting.

 Refer to the graph on page 19 to determine the appropriate DN of the pipe and fitting.

Connections of the S039 fitting	DN available
External threads, G or metric	DN06
External threads, G or NPT	DN08
Internal threads, G or NPT	DN15 to DN50

Materials

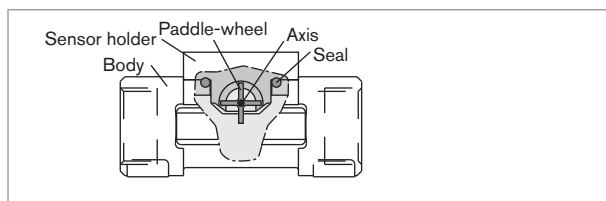


Fig. 2: Sectional drawing of the S039 fitting

Component	Material
Seal	FKM or EPDM
Body	Brass (CuZn39Pb2)

Component	Material
Screws	Stainless steel (316L - 1.4404)
Paddle-wheel	PVDF
Shaft and bearings	Ceramics (Al ₂ O ₃)

Dimensions

→ please refer to the technical data sheet related to the fitting available at: www.burkert.com

K factors (pulse/litre)

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

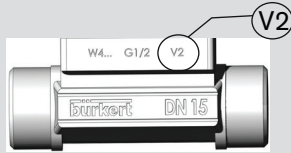
K factors (pulse/litre)			
DN06	DN08	DN15	DN15 v2
450	288	93,6	74,8

K factors (pulse/litre)				
DN20	DN25	DN32	DN40	DN50
60,3	45,9	28,7	18,2	10,4



Two versions of the S039 in DN15 exist, having different K factors.

Only version 2, identified by the "v2" marking, is available from March 2012. The "v2" marking can be found on the side of the DN15 fitting in metal:



To convert a K factor given in pulse/litre, use 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

7. INSTALLATION

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.

Risk of injury due to high fluid temperatures.

- ▶ Use safety gloves to handle the fitting.
- ▶ Stop the circulation of fluid and drain the pipe before loosening the process connections.

Risk of injury due to the nature of the fluid.

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



WARNING

Risk of injury due to non-conforming installation.

- ▶ Fluidic installation can only be carried out by qualified and authorised personnel with the appropriate tools.
- ▶ Observe the installation instructions for the measuring device inserted into the fitting.

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.

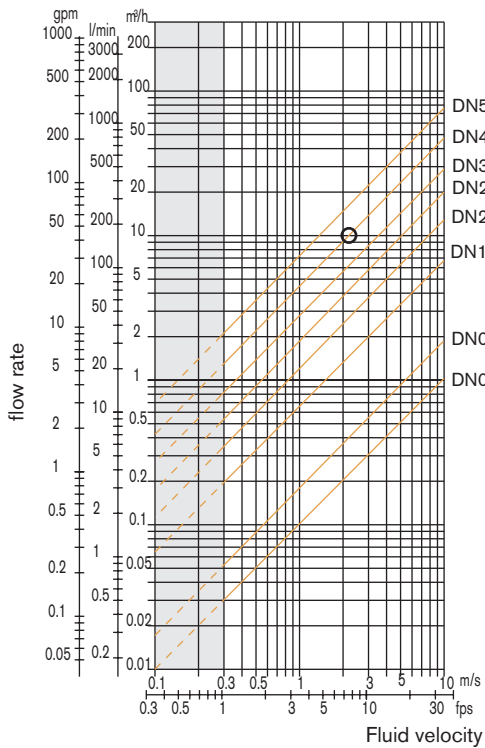
- ▶ Take into account the fluid pressure/ temperature dependency according to the materials from which the fitting is made and to the measuring device used (see the related Operating Instructions).
- ▶ Observe the Pressure Equipment Directive 2014/68/EU.

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

The graph is used to determine the DN of the pipe and the fitting appropriate to the application, according to the fluid velocity and the flow rate.

Selection example:

- Specification: if the nominal flow is 10 m³/h, the dimensioning of the optimal flow rate must be contained in 2 to 3 m/s
- Answer: on the chart, the intersection of flow rate and flow velocity gives the appropriate diameter, DN40.



→ Install the fitting on the pipe to comply with the upstream and downstream distances defined by standard EN ISO 5167-1 (see Fig. 3).

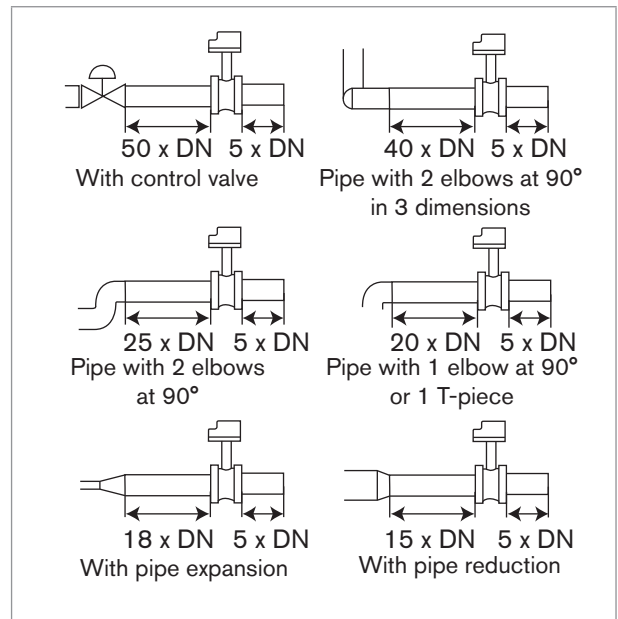


Fig. 3: Upstream and downstream distances depending on the design of the pipes.

- Use a flow conditioner, if necessary, to obtain the best accuracy.
- Prevent the formation of air bubbles in the pipe (see Fig. 4).
- Ensure the pipe is always filled with liquid (see Fig. 5).

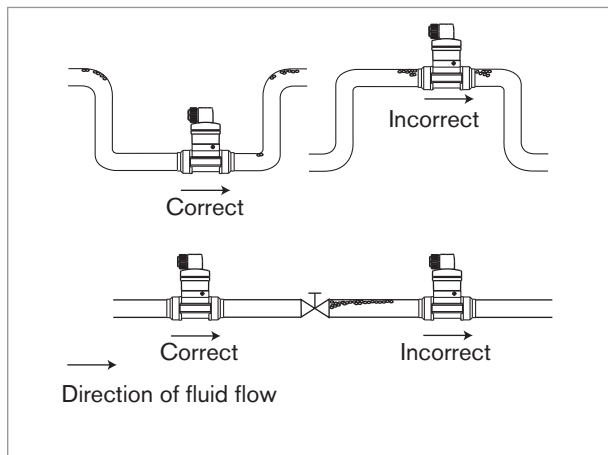


Fig. 4: Additional recommendations on installation

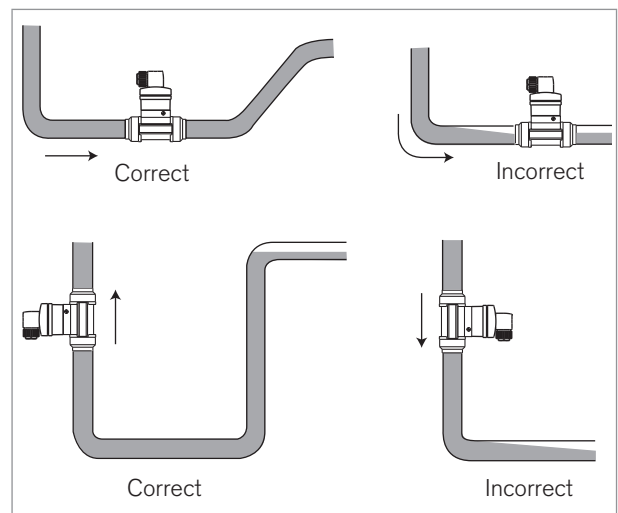


Fig. 5: Additional recommendations on installation

8. MAINTENANCE

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.

Risk of injury due to high fluid temperatures.

- ▶ Use safety gloves to handle the fitting.
- ▶ Stop the circulation of fluid and drain the pipe before loosening the process connections.
- ▶ Keep all easily flammable fluid or material away from the fitting.

Risk of injury due to the nature of the fluid.

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

Cleaning

NOTE

The fitting may be damaged by the cleaning product.

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

9. SPARE PARTS AND ACCESSORIES

ATTENTION

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

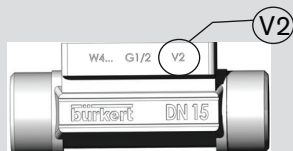
Incorrect accessories and unsuitable spare parts may cause injuries and damage the fitting and the surrounding area.

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



Two versions of the S039 in DN15 exist.

Only version 2, identified by the "v2" marking, is available from March 2012. The "v2" marking can be found on the side of the DN15 fitting in metal:



Spare parts	Article number
Sensor holder in PVDF	
With PVDF paddle-wheel, FKM seal, screws and certificate, for DN06, DN08, and DN15 v2	559 602
With PVDF paddle-wheel, FKM seal, screws and certificate, for DN15 (except DN15 v2) to DN50.	444 657
Set of O-rings (DN6 to DN50) for metal fittings	
FKM	444 655
EPDM	444 656



Fig. 6: Position of O-ring in an S039 fitting

10. PACKAGING, TRANSPORT, STORAGE

ATTENTION

Damage due to transport

- ▶ Transport may damage an insufficiently protected part.
- ▶ Transport the fitting in shock-resistant packaging and away from humidity and dirt.
- ▶ Do not expose the fitting to temperatures that may exceed the admissible storage temperature range.

Poor storage can damage the fitting.

- ▶ Store the fitting in a dry place away from dust.
- ▶ Storage temperature: -15 to +100 °C.

Damage to the environment caused by fittings contaminated by fluids.

- ▶ Dispose of the fitting and its packaging in an environmentally-friendly way.
- ▶ Keep to the existing provisions on the subject of waste disposal and environmental protection.