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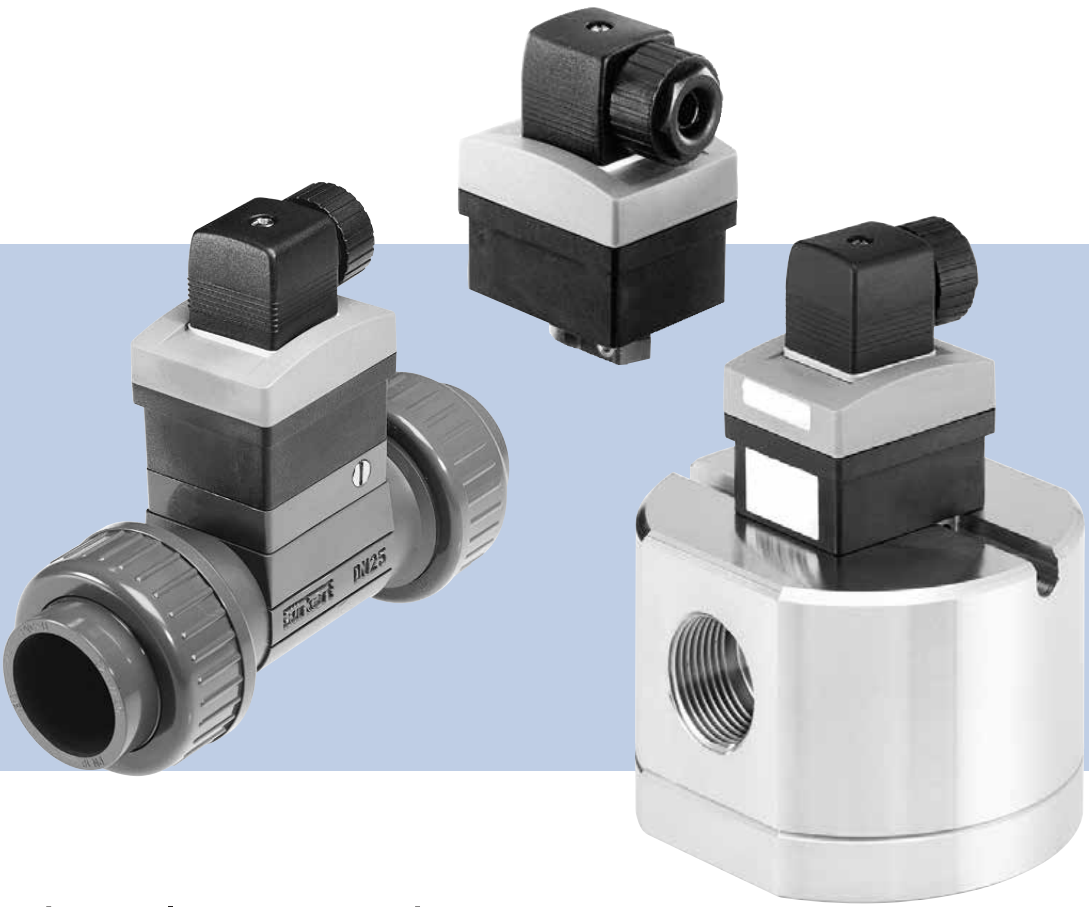
bürkert
FLUID CONTROL SYSTEMS

Type 8030 – SE30

INLINE Flowmeter – Flow transmitter



Operating Instructions

Bedienungsanleitung
Manuel d'utilisation

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1. ABOUT THESE OPERATING INSTRUCTIONS

The Operating Instructions describe the entire life cycle of the device. 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. Pay attention in particular to the chapters "3. Basic safety information" and "2. Intended use".

- Whatever the version of the device, the Operating Instructions must be read and understood.

Definition of the word "device"

The word "device" used within these Operating Instructions refers to the flowmeter type 8030 or to the flow transmitter type SE30.

Symbols used

DANGER

Warns against an imminent danger.

- Failure to observe this warning results 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.

CAUTION

Warns against a possible risk.

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

NOTE

Warns against material damage.

Indicates additional information, advice or important recommendations.

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

- Indicates an instruction to be carried out to avoid a danger, a warning or a possible risk.

→ Indicates a procedure to be carried out.

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2. INTENDED USE

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

The flowmeter type 8030 and the flow transmitter type SE30 combined with a sensor-fitting are intended exclusively to measure flow rate in liquids.

- Use the device in compliance with the characteristics and commissioning and use conditions specified in the contractual documents and in the Operating Instructions.
- Never use the device for security applications.
- Use the device only in combination foreign devices or foreign components recommended or approved by Bürkert.
- Protect the device against electromagnetic interference, ultraviolet rays and, when installed outdoors, the effects of climatic conditions.
- Only operate a device in perfect working order.
- Store, transport, install and operate the device properly.
- Only use the device 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 device.

The operating company is responsible for the respect of the local safety regulations including for the staff safety.

Danger due to high pressure in the installation

Danger due to electrical voltage

Danger due to high temperatures of the fluid

Danger due to the nature of the fluid

Various dangerous situations

To avoid injury:

- Do not use the device in explosive atmospheres.
- Transport, install and dismantle a heavy device with the help of another person and with appropriate tools.

Various dangerous situations

To avoid injury:

- Do not use the device in an environment incompatible with the materials it is made of.
- Do not use fluid that is incompatible with the materials the device is made of.
- Do not make any modifications to the device.
- Do not subject the device to mechanical loads.
- 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.

NOTE

The device may be damaged by the fluid in contact with

- Systematically check the chemical compatibility of the component materials of the device 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).

NOTE

Elements / Components sensitive to electrostatic discharges

The device contains electronic components sensitive to electrostatic discharges. They may be damaged if they are touched by an electrostatically charged person or object. In the worst case scenario, these components are instantly destroyed or go out of order as soon as they are activated.

- To minimise or even avoid all damage due to an electrostatic discharge, take all the precautions described in standard EN 61340-5-1.
- Do not touch any of the live electrical components.

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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

You may also contact your local Bürkert sales office.

The addresses of our international sales offices are available on the internet at: country.burkert.com

Warranty conditions

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

Information on the Internet

You can find the Operating Instructions and technical data sheets regarding the types 8030 or SE30 at: country.burkert.com

5. DESCRIPTION

Construction of the flow transmitter SE30

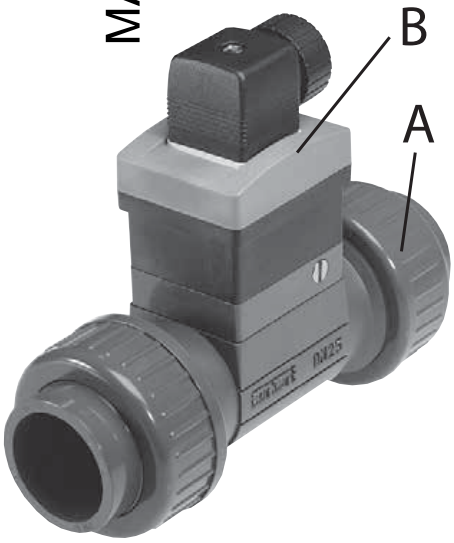
The SE30 is a flow transmitter and has:

- 1 transistor output NPN

or

- 1 NPN transistor output and 1 PNP transistor output

Construction of the flowmeter 8030

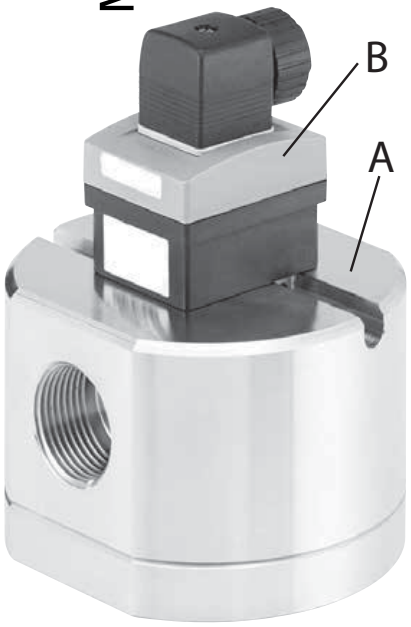


A: Sensor-fitting type S030 including the paddle-wheel flow sensor.

Set in rotation by the flow, the 4 permanent magnets integrated in the vanes of the paddle generate pulses, the frequency of which is proportional to the flow velocity of the fluid.
A conversion coefficient specific to each pipe (material and diameter) is necessary to determine the flow rate value associated with the measurement.
The conversion coefficient (K-factor) expressed in pulses per litre is given in the Operating Instructions of the sensor-fitting type S030 used, available at: country.burkert.com.

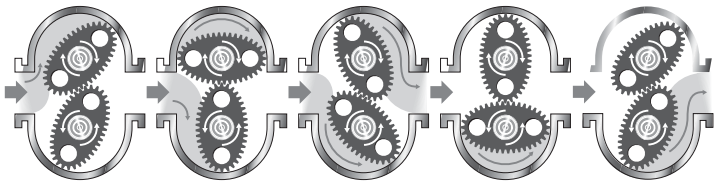
B: Flow transmitter SE30 (see page 10).

Construction of the flow transmitter SE30 with sensor-fitting S077



A: Sensor-fitting type S077 including the flow sensor with oval gears.

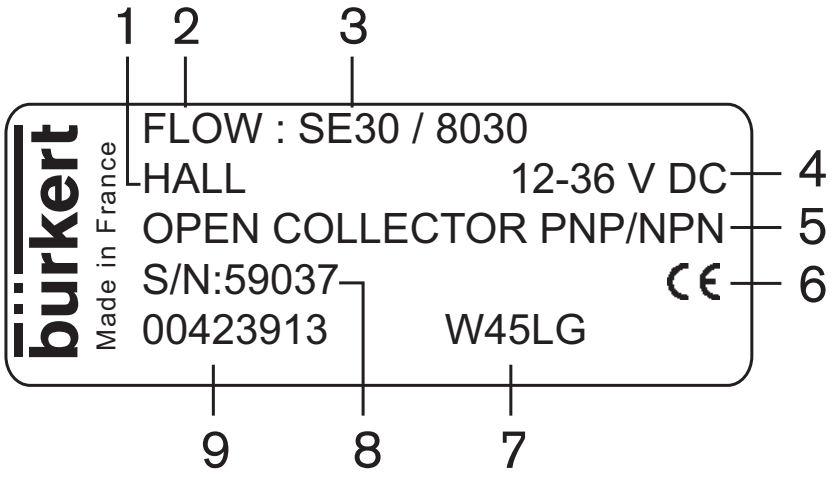
The sensor-fitting includes the flow sensor with oval gears.



Set in rotation by the flow, the magnets integrated in the oval gears generate pulses, the frequency of which is proportional to the volume of fluid. A conversion coefficient specific to each pipe (material and diameter) is necessary to determine the flow rate value associated with the measurement.
The conversion coefficient (K-factor) expressed in pulses per litre is given in the Operating Instructions of the sensor-fitting type S077 used, available at: country.burkert.com

B: Flow transmitter SE30
(see page 10).

Type label



1. Type of sensor
2. Measured quantity
3. Type of the device
4. Supply voltage
5. Output data
6. Conformity marking
7. Manufacturing code
8. Serial number
9. Article number

Fig. 1: Type label (example)

Symbols on the device

Symbol	Description
	Direct current
	Alternating current
	Earth terminal
	Protective conductor terminal

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6. TECHNICAL DATA

Technical data of an SE30

The technical data of the flow transmitter SE30 may be restricted by the sensor-fitting used.

- ▸ Refer to the Operating Instructions of the sensor-fitting used.

Conditions of use of an SE30

Ambient temperature (operating)	–15 °C...+60 °C
Air humidity	< 80 %, non condensated
Protection rating	IP65, female connector wired, plugged and tightened

Standards and directives of an SE30

The device complies with the relevant EU harmonisation legislation. In addition, the device also complies with the requirements of the laws of the United Kingdom.

The harmonised standards that have been applied for the conformity assessment procedure are listed in the current version of the EU Declaration of Conformity/UK Declaration of Conformity.

Materials of an SE30

Part	Material
Housing, male fixed connector	PC
Female connector type 2518 / screw / seal	PA / stainless steel / NBR
Type label	Polyester

Dimensions of an SE30

Please refer to the technical data sheets of the device, available at: country.burkert.com

Electrical data of an SE30

Supply voltage	
• Hall version	• 12...36 V DC, filtered and regulated. The device must be connected permanently to a Safety Extra-Low Voltage circuit (SELV circuit) or Protective Extra Low Voltage (PELV circuit).
• Hall Low Power version	• 12...36 V DC, via transmitter the device is connected to.

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Current consumption • Hall version • Hall Low Power version	 • 30 mA max. • 0.8 mA max.
Protection against polarity reversal	yes
Transistor output (Hall version)	Pulse output, NPN and PNP, open collector, max. 100 mA, frequency up to 300 Hz, duty cycle 1/2 ± 10 % NPN output: 0.2...36 V DC PNP output: supply voltage
Transistor output (Hall Low Power version)	Pulse output, NPN, open collector, max. 10 mA, frequency up to 300 Hz, duty cycle 1/2 ± 10 %

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Technical data of an 8030

Conditions of use of an 8030

→ See "Conditions of use of an SE30", page 15.

Standards and directives of an 8030

The device complies with the relevant EU harmonisation legislation. In addition, the device also complies with the requirements of the laws of the United Kingdom.

The harmonised standards that have been applied for the conformity assessment procedure are listed in the current version of the EU Declaration of Conformity/UK Declaration of Conformity.

Conformity to the Pressure Equipment Directive

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

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

- Device used on a pipe (PS = maximum admissible pressure, in bar; DN = nominal dimension of the pipe, in mm)

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

Dimensions of an 8030

→ Please refer to the technical data sheets of the device, available at: country.burkert.com

Materials of an 8030

Wetted parts	Material
• Sensor-fitting S030	• Refer to the Operating Instructions of the sensor-fitting used.

→ See also "Materials of an SE30", page 16.

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Fluid data of an 8030

Pipe diameter	DN6 to DN65. The appropriate diameter is determined using the flow rate / DN / fluid velocity graphs.
Fluid pressure	Depends on the material of the fitting used and on the fluid temperature: refer to the Operating Instructions of the sensor-fitting used.
Fluid temperature	The fluid temperature may be restricted by the fluid pressure: refer to the Operating Instructions of the sensor-fitting used.
• with sensor-fitting S030 in metal or PVDF	• –15...+100 °C
• with sensor-fitting S030 in PP	• 0...+80 °C
• with sensor-fitting S030 in PVC	• 0...+50 °C
Type and data of the fluid	Refer to the Operating Instructions of the sensor-fitting used.

Flow rate measurement	
• Measurement range	• 0.3...10 m/s
• Measurement deviation	
- with K-factor determined with a Teach-In procedure	- ±1 % of the measured value * (at the value of the Teach-In flow rate)
- with standard K-factor	- ±2.5 % of the measured value *
• 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

Electrical data of an 8030

→ See "Electrical data of an SE30", page 16.

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Technical data of an SE30 with sensor-fitting S077

Conditions of use of an SE30+S077

Ambient temperature (operating)	0...+60 °C
Air humidity	< 80 %, non condensated
Protection rating	IP65, female connector wired, plugged and tightened

Standards and directives of an SE30+S077

The device complies with the relevant EU harmonisation legislation. In addition, the device also complies with the requirements of the laws of the United Kingdom.

The harmonised standards that have been applied for the conformity assessment procedure are listed in the current version of the EU Declaration of Conformity/UK Declaration of Conformity.

Conformity to the Pressure Equipment Directive

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

- Observe the fluid nominal pressure (PN) for the device. The nominal pressure (PN) is given by the device manufacturer.

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

- Device used on a pipe (PS = maximum admissible pressure, in bar; DN = nominal dimension of the pipe, in mm)

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

Dimensions of an SE30+S077

→ Please refer to the technical data sheets of the SE30+S077, available at: country.burkert.com

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Materials of an SE30+S077

Wetted parts	Material
• Sensor-fitting S077	• Refer to the Operating Instructions of the sensor-fitting used.

→ See also "Materials of an SE30", page 16.

Fluid data of an SE30+S077

Type and data of the fluid	Refer to the Operating Instructions of the sensor-fitting used.
Fluid temperature	
• with sensor-fitting S077 in aluminium	• –20...+80 °C
• with sensor-fitting S077 in stainless steel	• –20...+120 °C
Maximum pressure of the fluid	
• DN15	• 55 bar (thread process connection)
• DN25	• 55 bar (or in accordance to the value of the used flanges)
• DN40 or DN50	• 18 bar
• DN80 / DN100	• 12 bar / 10 bar

Flow rate measurement	
• Measurement range	
- viscosity > 5 mPa.s	- 2...1200 l/min
- viscosity < 5 mPa.s	- 3...616 l/min
• Measurement deviation	
- if "specific" K-factor is used (marked on the name plate of the device)	- ±0.5 % of the measured value
- if "standard" K-factor is used	- ±1 % of the measured value
• Repeatability	• ±0.03 % of the measured value

Electrical data of an SE30+S077

→ See "Electrical data of an SE30", page 16.

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7. INSTALLATION AND COMMISSIONING

Safety instructions

DANGER

Risk of injury due to electrical voltage

- If a 12...36 V DC powered version is installed either in a wet environment or outdoors, all the electrical voltages must be of max. 35 V DC.
- Shut down and isolate the electrical power source before carrying out work on the system.
- Observe all applicable accident protection and safety regulations for electrical equipment.

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 burn injury due to high fluid temperatures

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

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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 unintentional switch on of power supply or uncontrolled restarting of the installation

- Take appropriate measures to avoid unintentional activation of the installation.
- Guarantee a set or controlled restarting of the process subsequent to any intervention on the device.

WARNING

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

- Take account of fluid temperature-pressure dependency according to the nature of the materials the sensor-fitting is made of (see the technical data and the Operating Instructions of the sensor-fitting used).
- Comply with the Pressure Equipment Directive 2014/68/EU.

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WARNING

Risk of injury due to non-conforming commissioning.

Non-conforming commissioning may lead to injuries and damage the device and its surroundings.

- Before commissioning, make sure that the staff in charge have read and fully understood the contents of the Operating Instructions.
- In particular, observe the safety recommendations and intended use.
- The device / the installation must only be commissioned by suitably trained staff.
- Before commissioning, adjust the K-factor of the sensor-fitting used. Refer to the Operating Instructions of the sensor-fitting used.

Protect the device against electromagnetic interference, ultraviolet rays and, when installed outdoors, the effects of the climatic conditions.

To make sure the device operates correctly, plug in and tighten the connector.

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Fluid Installation of the 8030

The 8030 is inserted into an S030 sensor-fitting mounted on the pipe. The SE30 is assembled on the S030 sensor-fitting by a quarter-turn rotation system.

Installing the S030 sensor-fitting on the pipe

→ Select an S030 sensor-fitting suitable for the fluid in the pipes. Refer to the graphs page 31. These graphs are used to determine the DN of the sensor-fitting S030 appropriate to the application, according to the fluid velocity and the flow rate.

Example :

- Specification: for a nominal flow rate of 10 m³/h, the ideal flow velocity is between 2 and 3 m/s.
- Solution: intersection between flow rate and flow velocity in the graph gives the appropriate pipe diameter, DN40 (or DN50 for the asterisked fittings).

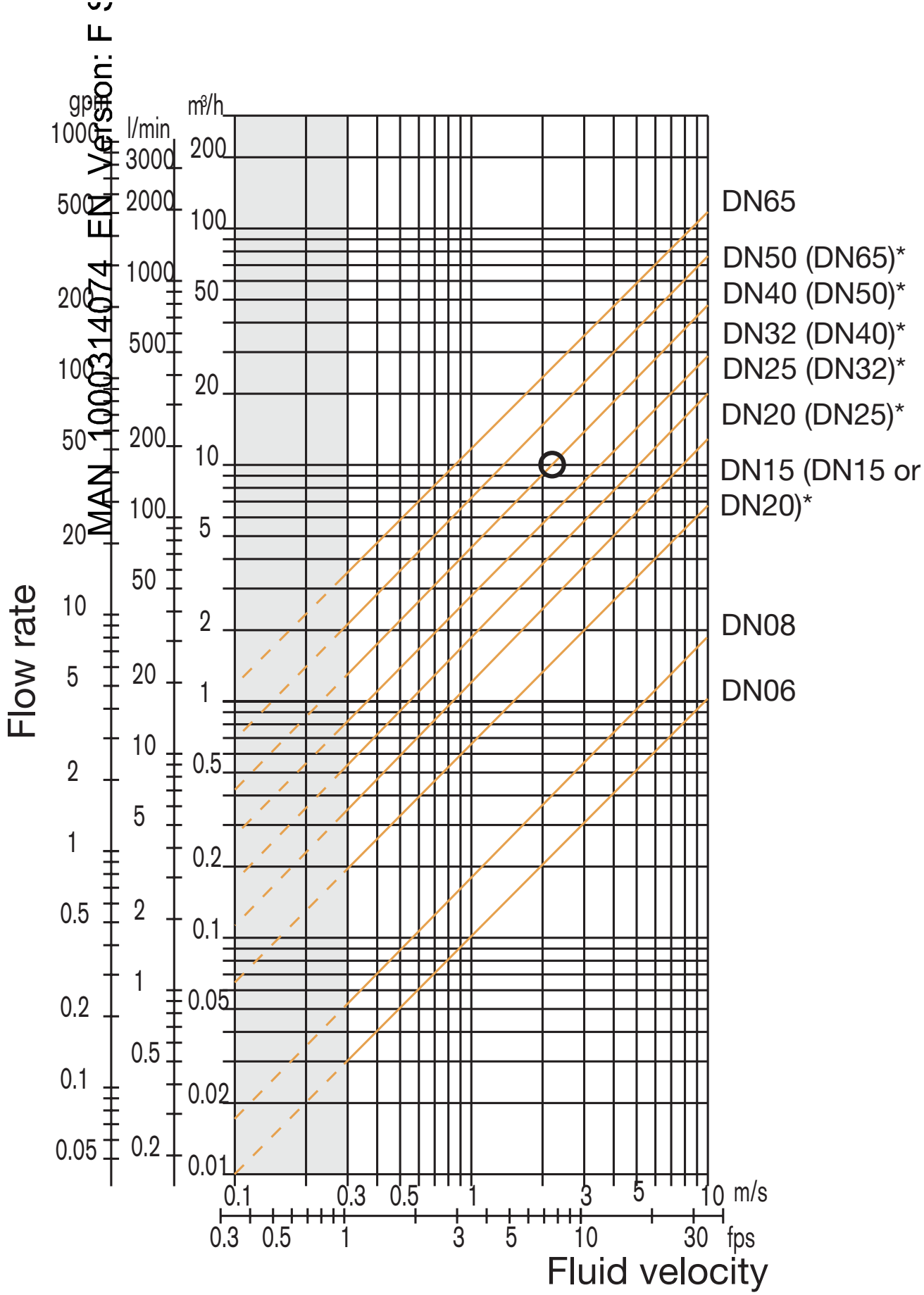
* For the fittings:

- with external thread connections acc. to SMS 1145
- with welding end connections acc. to SMS 3008, BS 4825-1 / ASME BPE / DIN 11866 series C, DIN 11850 series 2 / DIN 11866 series A / EN 10357 series A
- Clamp connections acc. to SMS 3017, BS 4825-3 / ASME BPE, DIN 32676 series A

! 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.

! The norm for the clamp connections DIN 32676 series A has been added.


gpm
l/min
m³/h
Flow rate
DN65
DN50 (DN65)*
DN40 (DN50)*
DN32 (DN40)*
DN25 (DN32)*
DN20 (DN25)*
DN15 (DN15 or DN20)*
DN08
DN06
m/s
fps
Fluid velocity

Assembling the SE30 with the S030 sensor-fitting

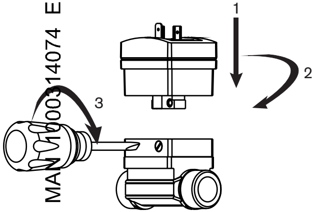
<table>
<tr>
<td> 
</td>
<td>1. Install the SE30 in the S030 sensor-fitting.
2. Turn the SE30 by a quarter turn.</td>
</tr>
<tr>
<td colspan="2">3. Tighten the lateral screw(s) to lock SE30 in place on the sensor-fitting (tightening torque max. 1 Nm, i.e. 0.74 lbf·ft).</td>
</tr>
</table>

Fig. 2: Assembling the SE30 and the S030 sensor-fitting

Finalising the installation of the 8030

→ Wire the device and switch it on (see "Wiring", page 35).

Fluid installation of an SE30 with S077 sensor-fitting

The SE30 is inserted into an S077 sensor-fitting mounted on the pipe. The SE30 is assembled on the S077 sensor-fitting by a quarter-turn rotation system.

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Installing the S077 sensor-fitting on the pipe

→ Select an S077 sensor-fitting adapted to the viscosity of the fluid in the pipe.

To select a sensor-fitting, refer to the technical data sheet for the relevant sensor-fitting.

CAUTION

Risk of damage when installing the sensor-fitting.

▸ Follow the installation instructions given in the Operating Instructions for the sensor-fitting.

→ Install the sensor-fitting S077 on the pipe in such a way that:

- the spindles of the oval gears are set horizontally, as shown in Fig. 3.
- the installation instructions given in the Operating Instructions of the sensor-fitting used are respected.

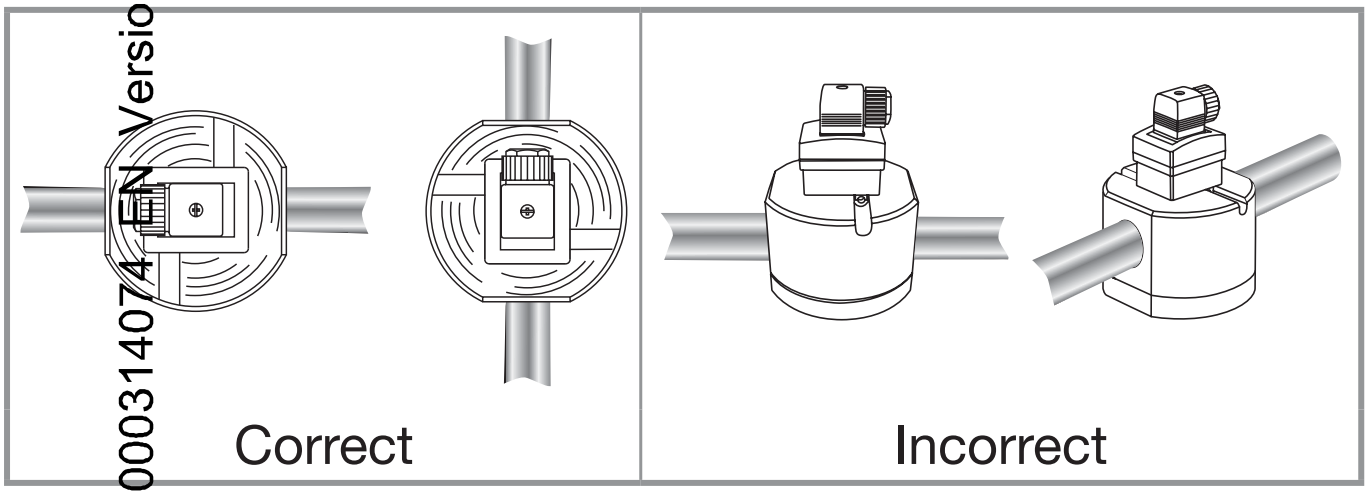
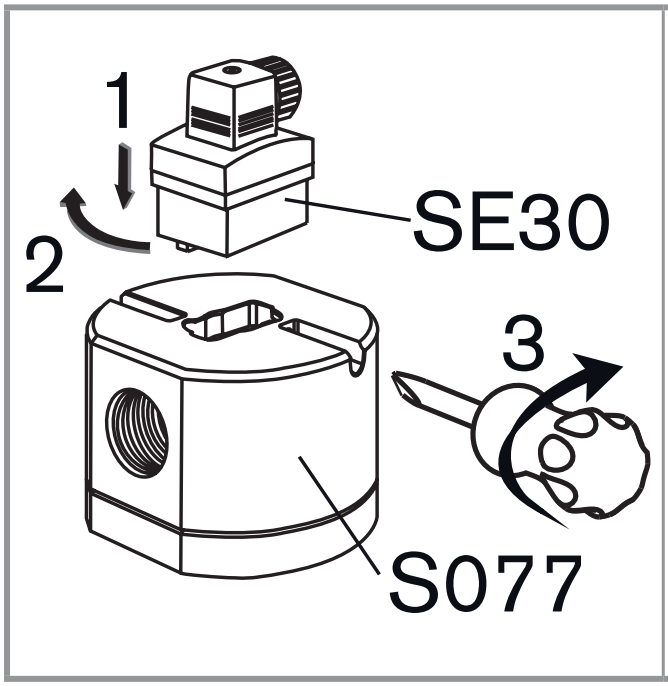


Fig. 3: The spindles of the oval gears must be horizontal

Assembling the SE30 with the S077 sensor-fitting



→ Insert the SE30 in the S077 sensor-fitting.

→ Turn the SE30 by a quarter turn.

→ Tighten the lateral screws to lock the SE30 in place on the S077 sensor-fitting (tightening torque max. 1 Nm, i.e. 0.74 lbf·ft).

Fig. 4: Istallation of the SE30 in the S077 sensor-fitting

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Finalising the installation of the SE30 with S077 sensor-fitting

→ Wire the device and switch it on (see "Wiring", page 35).

Wiring

DANGER

Risk of injury due to electrical discharge

- If a 12...36 V DC powered version is installed either in a wet environment or outdoors, all the electrical voltages must be of max. 35 V DC.
- Disconnect the electrical power for all the conductors and isolate it before carrying out work on the system.
- Observe all applicable accident protection and safety regulations for electrical equipment.

Protect the power supply

- Protect the power supply with a correctly rated fuse if it is not protected by default.

- Use a high quality electrical power supply (filtered and regulated).

Electrical connection is made via a male fixed connector by a female connector type 2518 or type 2509.

Specifications of the connection cables

Tab. 1: Specifications of the cables and wires for the female connector type 2518 with article number 00572264 (supplied), or the female connector type 2509 with article number 00162673 (not supplied)

Specification of the cables and the conductors (not supplied)	Recommended value
Shielded cable	yes
Length of the cable	max. 50 m
External diameter of the cable	5...8 mm
Operating temperature	min. 80 °C
Cross section of the conductors, except the local earth conductor	0.25...1.5 mm^2

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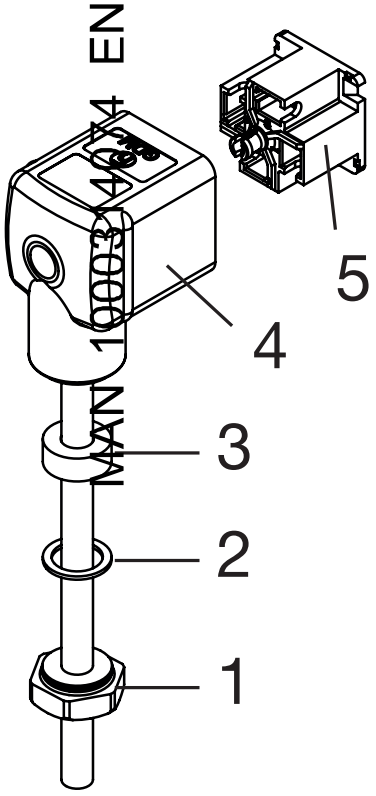
Assembling the female connector



→ Unscrew the pressure screw [1] and remove the pressure ring [2] and the seal [3].

→ Remove contact holder [5] from the cover [4].

→ Insert the cable into pressure screw [1], through the pressure ring [2], through the seal [3] and finally through the cover [4].

→ Connect the wires on the contact holder [5].

→ Position the contact holder [5] in steps of 90° then put it back into cover [4], pulling gently on the cable so that the wires do not clutter the housing.

→ Tighten the pressure screw [1] (1.5...2 Nm).

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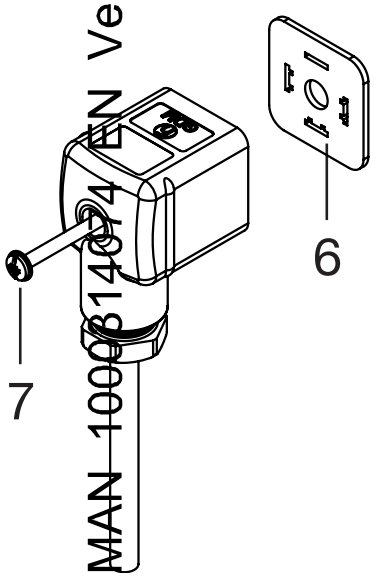
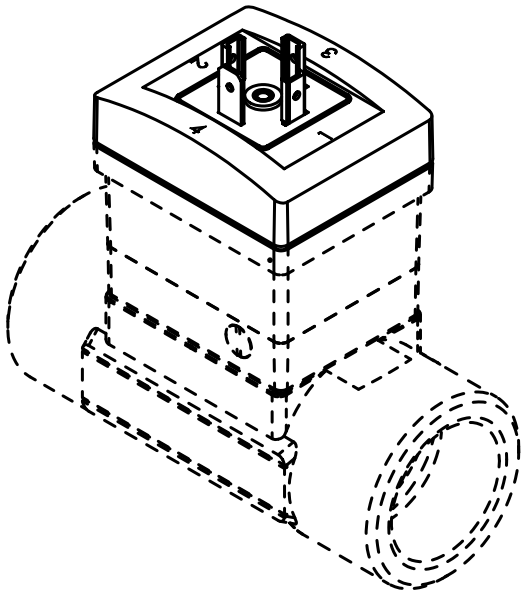


→ Place the seal [6] between the connector and the fixed connector on the device and then plug the type 2518 connector into the fixed connector.

→ Insert and tighten the central screw [7] (0.5...0.6 Nm) to ensure tightness and correct electrical contact.

Fig. 5: Assembling the female connector type 2518 (supplied)



1. V+ (12...36 V DC)
2. NPN transistor output
3. 0 V DC
4. PNP transistor output

Fig. 6: Pin assignment of the male fixed connector, Hall version

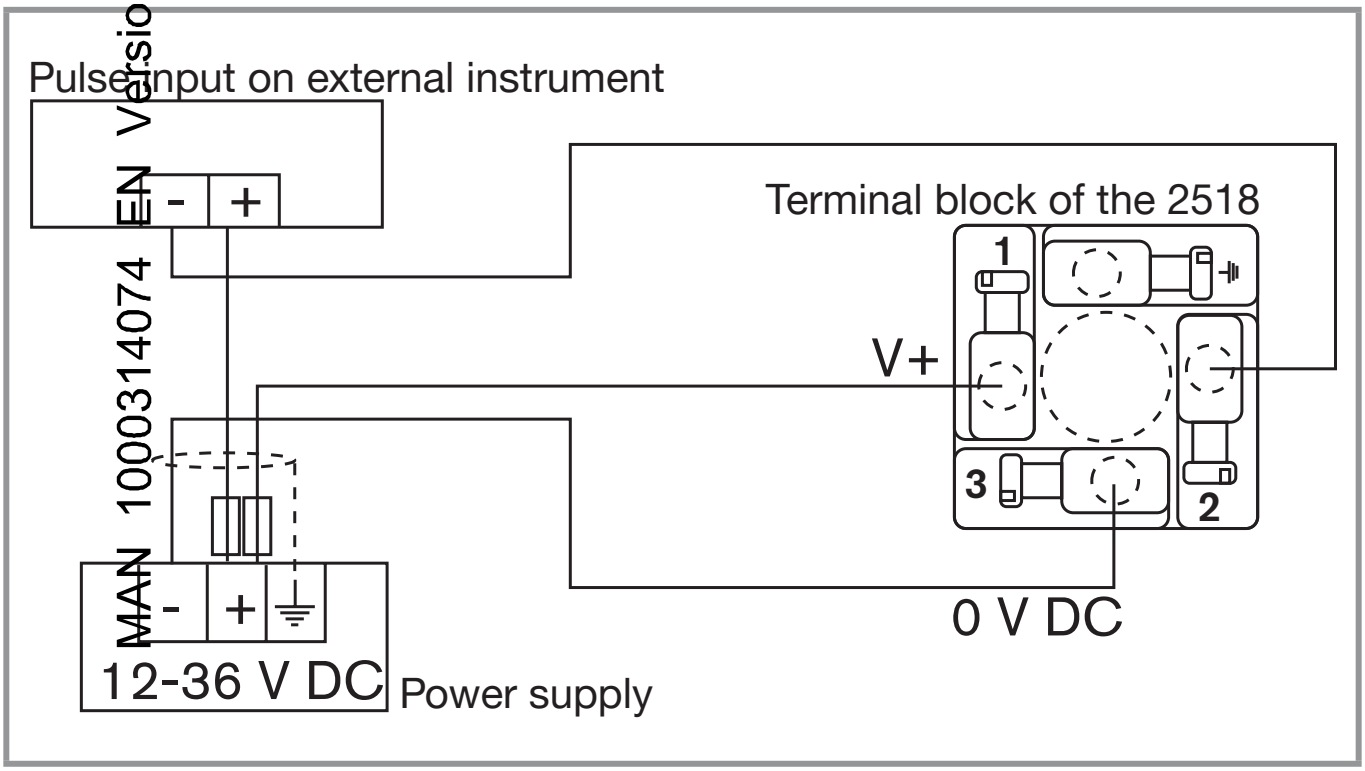


Fig. 7: NPN wiring of the Hall version

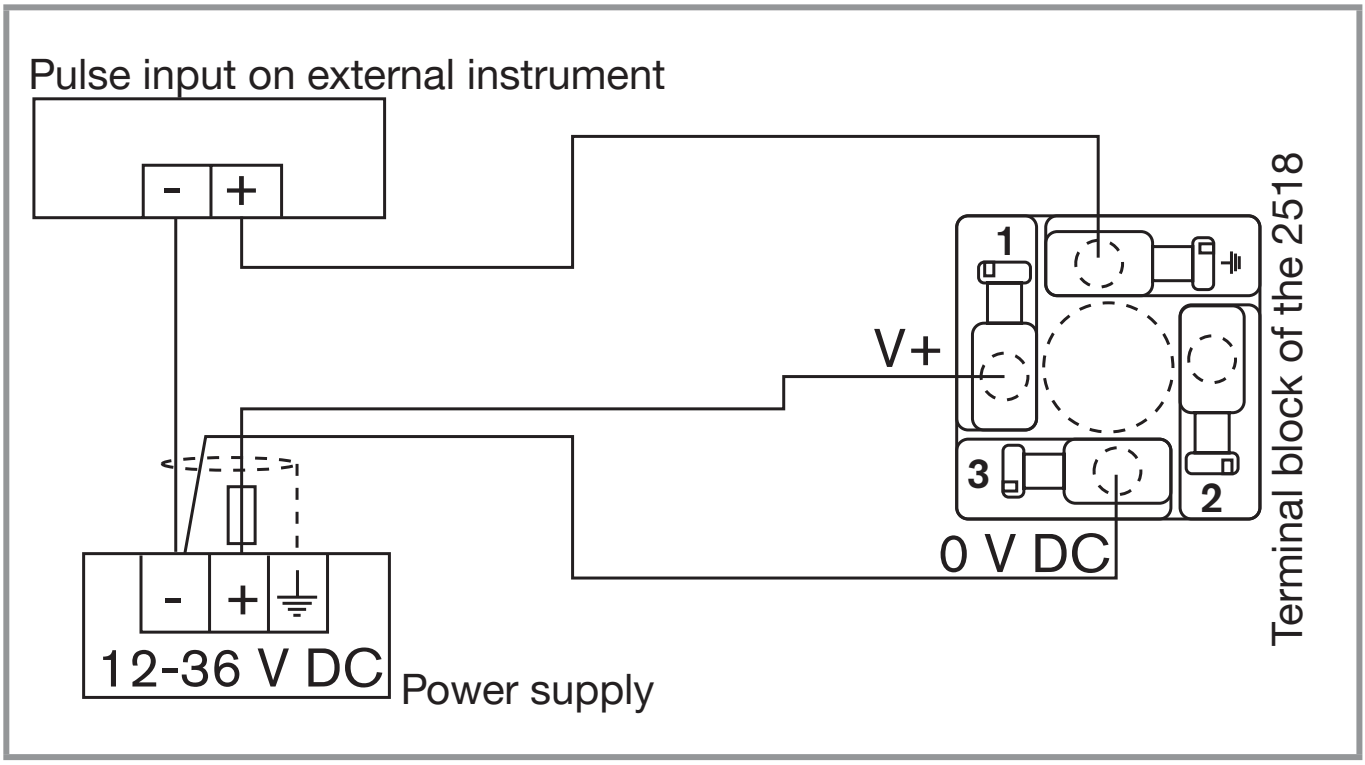
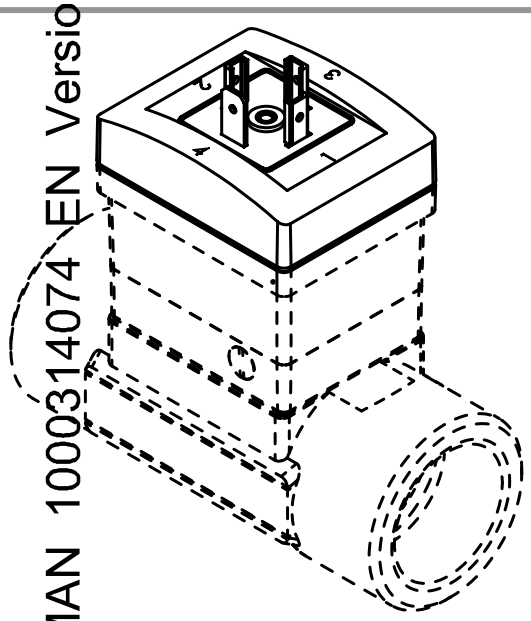


Fig. 8: PNP wiring of the Hall version



1. V+ (12...36 V DC)
2. NPN transistor output
3. 0 V DC
4. Not connected

Fig. 9: Pin assignment of the male fixed connector, Hall Low Power version

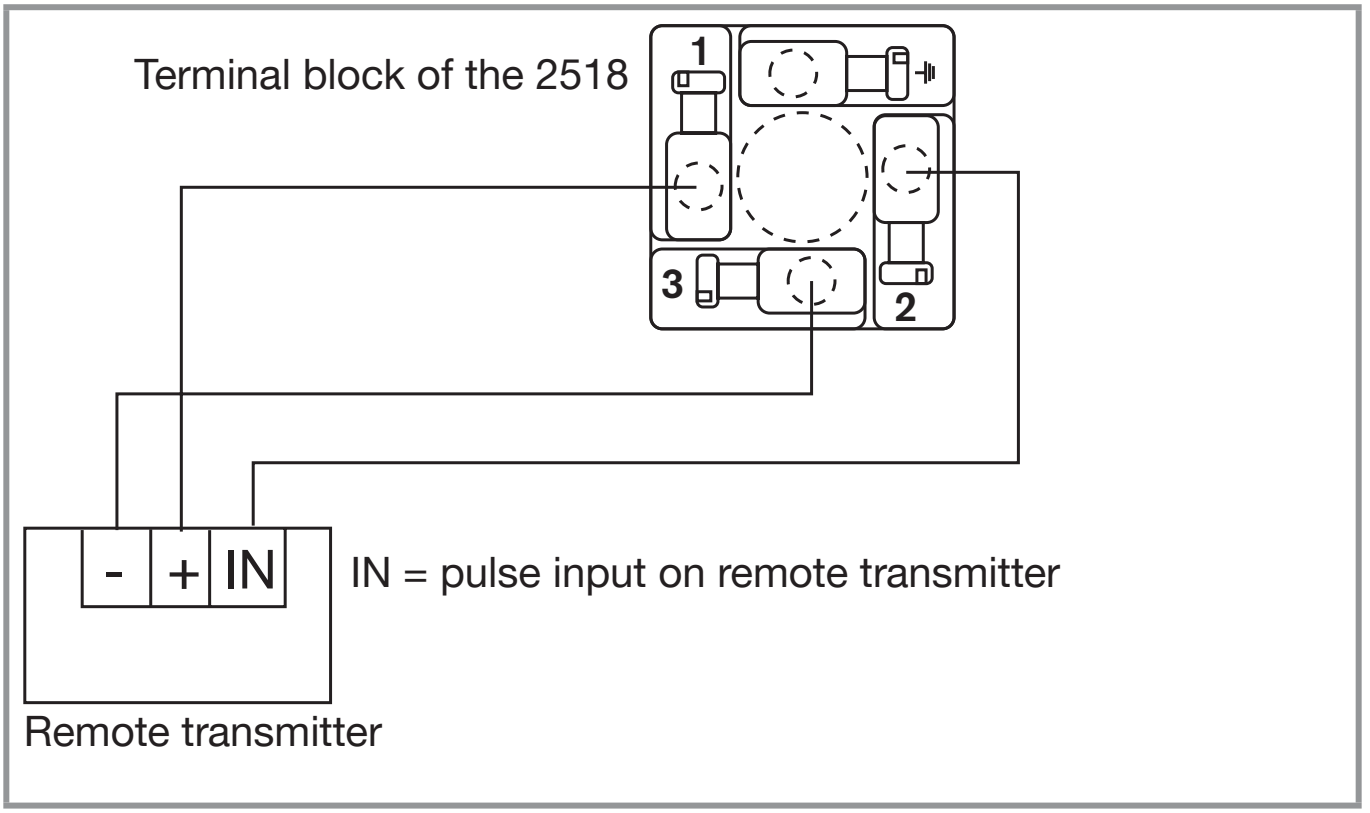


Fig. 10: NPN wiring of the Hall Low Power version

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8. MAINTENANCE

Safety instructions

DANGER

Risk of injury due to electrical voltage.

- If a 12...36 V DC powered version is installed either in a wet environment or outdoors, all the electrical voltages must be of max. 35 V DC.
- Disconnect the electrical power for all the conductors and isolate it before carrying out work on the system.
- Observe all applicable accident protection and safety regulations for electrical equipment.

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 burn injury due to high fluid temperatures

- Use safety gloves to handle the device.
- 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 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 the device

→ The device can be cleaned with a cloth dampened with water or a detergent compatible with the materials the device is made of.

Please feel free to contact your Bürkert supplier for any additional information.

9. 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 device and the surrounding area.

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

Accessories	Article number
Female connector with cable gland (type 2518) sealing in NBR	572264
Female connector with cable gland (type 2518) sealing in silicone	572330
Female connector (type 2509) with NPT 1/2" reduction, without cable gland	162673

10. PACKAGING, TRANSPORT

NOTE

Damage due to transport

Transport may damage an insufficiently protected device.

- Transport the device in shock-resistant packaging and away from humidity and dirt.
- Do not expose the device to temperatures that may exceed the admissible storage temperature range.
- Protect the electrical interfaces using protective plugs.

11. STORAGE

NOTE

Poor storage can damage the device.

- Store the device in a dry place away from dust.
- Storage temperature of the SE30 and the 8030: –15...+60 °C
- Storage temperature of the SE30+S077: 0...+60 °C

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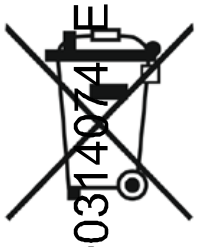
12. DISPOSAL

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 country.burkert.com.

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We reserve the right to make technical changes without notice.

Technische Änderungen vorbehalten.

Sous réserve de modification technique.

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