Dear Customer,

Congratulations on your purchase of our flow sensor 8030.

BEFORE INSTALLING OR USING THIS PRODUCT, PLEASE TAKE OUR ADVICE AND READ THE ENTIRE MANUAL THOROUGHLY.

This will enable you to fully profit from all of the advantages offered by this product.

1.1 Unpacking and Control

Please verify that the product is complete and free from any damage. The standard delivery must include:

-1 SE30 Flow Sensor
-1 Instruction Manual type SE30
-1 Instruction Manual Fitting type S030

Compare the Type specification on the label to the following ordering chart to ensure that you have received the proper unit. If there is any loss or damage, please contact your local Bürkert subsidiary.

1.2 About this Manual

This manual does not contain any warranty statement. Please refer to our general terms of sale and delivery.
Only properly-trained staff should install and/or repair this product. If difficulties should occur at the time of installation, please contact your nearest Bürkert sales office for assistance.

1.3 User's Responsibility for Safety

Bürkert manufactures a broad range of flow sensors. While each of these products is designed to operate in a wide variety of applications, it is the user's responsibility to select a transmitter model that is appropriate for the application, install it properly, and maintain all components. Special attention must be paid to the chemical resistance of the transmitter against the fluids which are directly contacting the product.

This symbol appears in the manual to call special attention to instructions that affect the safe installation, function and use of the product.

1.4 Electromagnetic Compatibility

This confirms that this product meets the main protection requirements as laid down in the Council Directive on the harmonization of the laws of the Member States relating to electromagnetic compatibility (89/336/EEC).

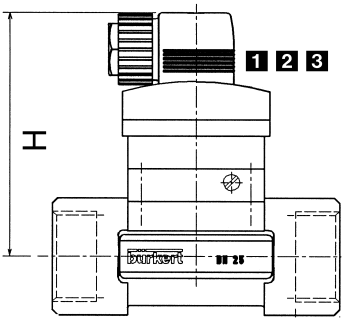
2.1 Flow Sensor 8030 type specification

The flow sensor 8030 is made of an electronic module SE30 designed to be mounted on a fitting S030 which houses the paddle-wheel.
Refer to the specific in struction manual for the fitting type S030.

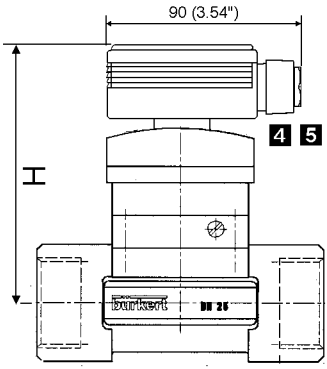
Sensor electronic	Power supply	Cable entry	Order N°
1 SE30 with coil	none	PG9	**423912 C**
2 SE30 with Hall sensor	12-30 VDC	PG9	**423913 D**
3 SE30 with Hall sensor "Low Power"	from 8021/3/5	PG9	**423914 E**

2.2 Dimensions of the flow sensor type 8030 Inline

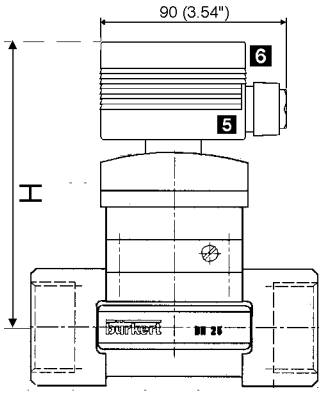
Type 8030 standard 1 2 3



Type 8030 with 4...20 mA 5
or calibrated frequency output 4



8030 with 4...20 mA output 5
and programming unit type 1077-3 6



DN	H1		H4		H6	
	mm	inch	mm	inch	mm	inch
15	92,0	3,63	113,5	4,47	125,5	4,95
20	89,0	3,51	110,5	4,36	122,5	4,83
25	89,5	3,53	111,0	4,37	123,0	4,85
32	93,0	3,67	114,5	4,51	126,5	4,99
40	97,0	3,82	118,5	4,67	130,5	5,14
50	104,0	4,10	125,5	4,95	137,5	5,42

The heigth H is independant from the connection type and material of the fitting.

2.3 Design and Measuring Principle

Design

The 8030 flow sensor is made of a compact fitting type S030 and an electronic module type SE30 which can be easily connected together by means of a quarter-turn system (bayonet).

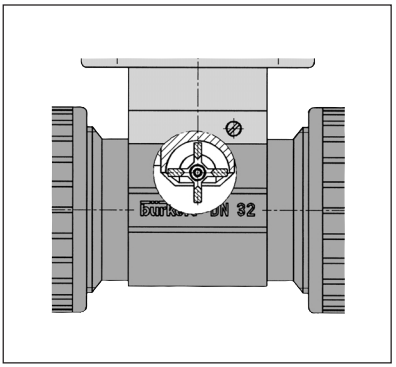
The output signal can be displayed or processed directly. The output signal is provided via a 4-pole cable plug according to DIN 43650.

In the versions with 4...20 mA **5** or adjustable pulse output **4**, an additional IP65 housing is pluged on the sensor instead of the cable plug. The output signals are available on a terminal strip inside the enclosure via a PG 9 cable gland.

All parts contacting the fluid are in PVDF or ceramic, enabling the use of the sensor in aggressive fluids.

Measuring Principle

When liquid flows through the pipe, 4 magnets inserted in the paddle-wheel set in rotation produce a measuring signal in the 8030 transducer (coil or Hall Sensor).



The frequency modulated induced voltage is proportional to the flow velocity of the fluid. A correlation coefficient (K-factor) specific to each fitting diameter and material is necessary to compute the flow-rate value. The correlation coefficient (K-factor pulse/l) is available in the instruction manual of the Inline fitting type S030.
A minimum flow velocity from 0.3 m/s (1.0 ft/s); flow value of 3 l/min in a DN15 pipe is required to ensure the flow measurement.

1 The flow sensor 8030 with coil requires no external power supply . This flow sensor can be only be operated with Burkert flow indicators/totalizers (8025; SE34) wall-mounted battery powered.

2 The flow sensor 8030 with Hall Sensor requires an external power supply of 12...30 VDC. It is designed for connection to any system with open collector frequency input PNP or NPN.

3 The flow sensor 8030 with Hall sensor "Low Power" is designed for use with Burkert flow transmitters or indicators (8025; 8021; 8023; 8600; SE34).

4 The flow sensor 8030 with adjustable frequency output module type 8021 requires an external power supply of 12...30 VDC. It is designed for connection to any system with open collector frequency input PNP or NPN.

5 The flow sensor 8030 with 4...20 mA output module type 8023, runs in 2-wires system and requires an external power supply of 12...24 VDC.

2.4 Technical Data

General Data

Pipe diameter	from DN 15 to DN 50 (1" to 2")
Measuring range	0.3 to 10 m/s (1.0 to 32.8 fps)
Flow range	as from 3 l/min (DN15 pipe, 0.3 m/s flow velocity)
Flow range	as from 1.0 gpm (1/2" pipe, 1.0 fps flow velocity)
Plastic fitting	**PVC; PP; PVDF**
Pressure class	PN10
Fluid temperature max	PVC: 50 °C (132 °F); PP: 80 °C (176 °F); PVDF: 100 °C (212 °F)

Metal fitting	**Stainless-stel (316L/1.4404); brass (Cu Zn39 Pb2)**
Pressure class	PN16
Fluid temperature max:	100 °C (212 °F)
Ambiant temperature	0 to 60 °C (32 to 140 °F)
Storage temperature	0 to 60 °C (32 to 140 °F)
Relative humidity	max. 80 %
Enclosure	IP65
Measuring error	1) with individual calibration on site or Teach-In (type 8025) ≤± 0.5 % o.F.S (*) 2) with standard K-factor ≤± (0.5 % o.F.S + 2,5 % o.R) (*)
Linearity	≤± 0.5 % o.F.S (*)
Repeatability	0.4 % o.R (*)
Pulses/rotation	2
Fitting	PVC, PP, PVDF, SS 316L (1.4404) or brass
Paddle-wheel	PVDF; Axis and bearing ceramic
O-rings	FPM standard (option EPDM)
Housing	PC

Specific data SE30 with coil 1 (ref 423912C)

Only for use with battery powered flow transmitter type 8025 or indicator type SE34

Measuring range	0.3 to 10 m/s (1.0 to 32.8 ft/s) from 3 l/min (DN15)
Power Supply	None
Output signal	Alternating 0...10 V, frequency: 0...300 Hz
Cable L. max.:	10 m (shielded cable max. 1,5 mm²)

Specific data SE30 with Hall sensor 2 (ref 423913D)

Measuring range	0.3 to 10 m/s (1.0 to 32.8 ft/s) from 3 l/min (DN15)
Power Supply	12...30 VDC
Output signal	Transistor NPN/PNP open collector max. 100 mA Frequency: 0...300 Hz
Cable L. max.:	50 m (shielded cable, max. 1,5 mm²)

Specific data SE30 with Hall sensor "low power" 3 (ref 423914E)

Measuring range	0.3 to 10 m/s (1.0 to 32.8 ft/s) from 3 l/min (DN15)
Cable L. max.:	50 m (shielded cable, max. 1,5 mm²)

Can only be connected to Burkert devices

Technical Data

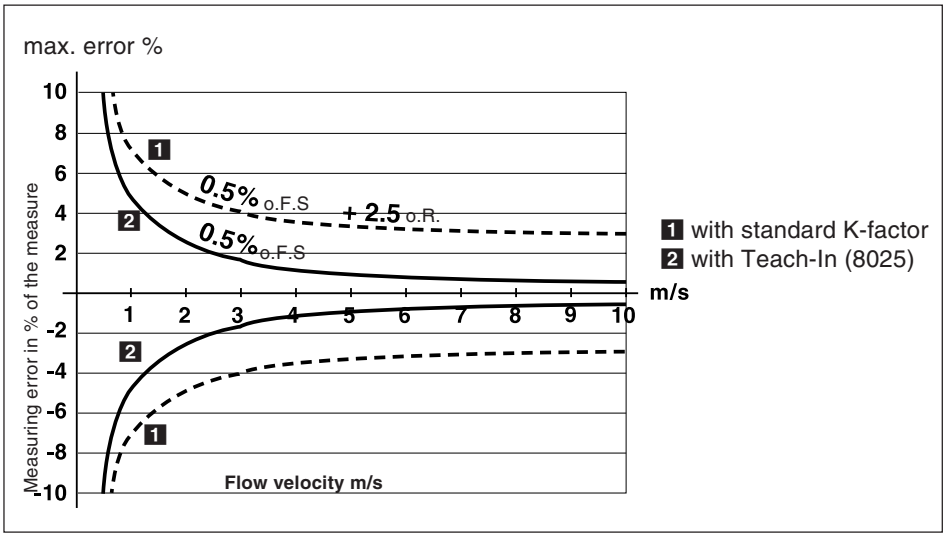
Specific data 8030 with Calibrated Frequency Output 4

Associated flow sensor SE30	Hall sensor versions 2 3
Associated pulse divider	type 8021 (ref 418895P)
Supply voltage	12...30 VDC
Output signal	transistor PNP and NPN open collector max. 100 mA
Accuracy	0.1 %
Material of additional housing	PA

Specific data 8030 with 4...20 mA Output 5

Associated flow sensor SE30	Hall sensor "Low Power" 3
Associated flow transmitter	type 8023 (ref 130428 V)
Supply voltage	12...24 VDC
Output signal	4...20 mA
Load	max. 500 Ω at 12 V; max. 1000 Ω at 24 V.
Accuracy	± 2 %
Material of additional housing	PA

(*) Under reference conditions i.e. measuring fluid water, ambiant and water temperatures 20 °C, applying the minimum inlet and outlet pipe straights, matched pipe dimensions.
o.F.S = of Full Scale; o.R = of Reading



Accuracy of the measurementwith/without Teach-In (water at 20°C)

3.1 Installation Guidelines

The 8030 flow sensor can only be used to measure pure, liquid and water ressembling fluids (solids content ≤ 1%, viscosity max. 300 cSt with on-line calibration).

Installation Guidelines

The recommended upstream and downstram straight pipe length should respect 10xD in and 3xD out.
According to pipe's design, necessary distances can be bigger or use a flow tranquilizer to obtain the best accuracy.
For more information please refer to EN ISO 5167-1.

The pipe must be completely filled with the liquid, i.e. air bubbles must not be present. The flow sensor is not designed for gas flow measurement.

The device must be protected from constant heat radiation and other environmental influences, such as direct exposure to sunlight.

The flow sensor can be installed in either horizontal or vertical pipe.

The suitable pipe size is selected using the diagram on the end pages. Pressure and temperature ratings must be respected according to the selected fitting material. (see fig. 3.1)

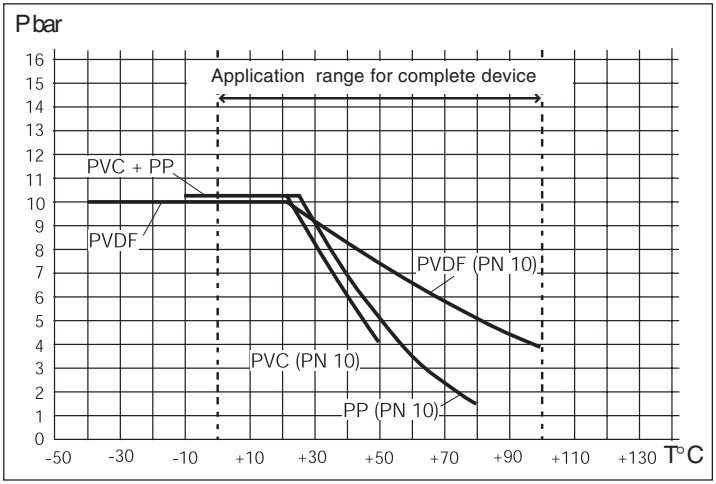


Fig. 3.1. Pressure-Temperature-Diagram

3.1.1 Servicing

In correct installation conditions, the sensors are maintenance-free. If contamination or clogging should nevertheless occur during operation, the sensor (paddle-wheel, bearing) can be cleaned with water or any appropriate to PVDF cleaning agent .

3.2 Installation

The flow sensor 8030 can be easily installed in pipes using the specially designed fitting system S030.

1. The fitting **1** must be installed into the pipe according to the installation specifications in section 3.1.

2. Fasten the electronic housing to the fitting using the bayonet connection, and turn by 30 °.

3. Tighten the electronic housing with the screw.

4 The optional transmitters (type 8021; 8023) are connected to the SE30 flow sensor via the upper cable plug socket.

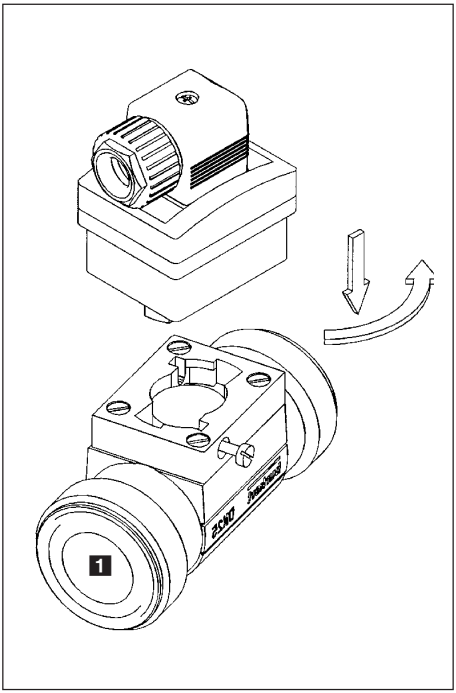


Fig. 3.2 Installation of 8030 flow sensor

3.3 General Electrical Connection

The terminal lead carries both the voltage supply and the measuring signal and should not be laid together with power cables or cables carrying high frequencies. If this cannot be avoided, then they should either be kept 30 cm (1 ft) apart or shielded cables should be used.
If using shielded cables, ensure that the shield is properly earthed. In normal operating conditions a single cable with a cross section of 0.75 mm^2 is adequate to transmit the measuring signal.
If in doubt, however, always use a shielded cable. The voltage supply must be of good quality (filtered and stabilised).

3.3.1 Connection distances

In order to ensure the integrity of the measuring signal of the flow sensor 8030, observe the following maximum distances of connection.

Sensor	Distance Max.**(*)**
8030 with coil **1**	10 m
8030 Hall **2**	50 m
8030 Hall "Low Power" **3**	50 m

(*): With shielded cable. These indicative distances may vary according to electromagnetical environment.

3.4 Electrical wiring 8030 standard

Standard DIN43650 plug connector, PG9-cable glands, pipe cross section max. 1.5 mm², IP65 rating.

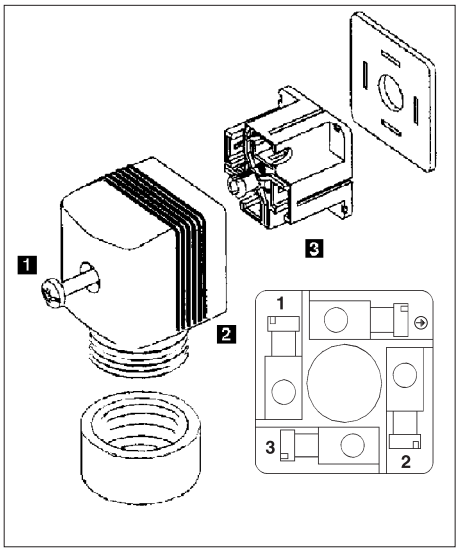


Fig. 3 .3 Type 2508 cable plug assembly

1. To open the connector remove the screw **1**.
2. Remove internal part **3** from external part **2**.
3. Connect according to above pin assignment.
4. When re-assembling, the internal part may be inserted into the external part **2** in 90 °-step intervals as required.

3.4.1 Wiring of 8030 with coil **1**

1: Not assigned
2: Pulse output
3: Pulse output
⏚: Not assigned

The flow sensor type 8030 with coil is designed to be connected to a wall mounted flow transmitter 8025 or indicator SE34 battery powered. (see fig. 3.5 and 3.7)

3.4.2 Wiring of 8030 with Hall sensor

1: L+(12...30 VDC)
2: Pulse output NPN
3: L-
⏚: Pulse output PNP

The flow sensor type 8030 with Hall sensor can be connected to a remote flow transmitter 8025 or indicator SE34 (see fig. 3.5 and 3.7).

3.4.3 Connection of the flow sensor to the Flow Indicator type SE34 12-30 VDC/battery separate (Wall-mounted or Panel version)

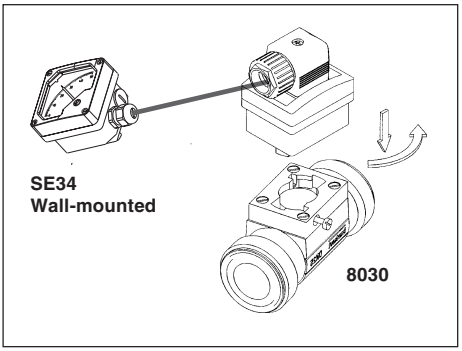


Fig. 3.4 Flow indicator wall-mounted

For technical information about the flow indicator type SE34, please refer to data sheet type SE34.

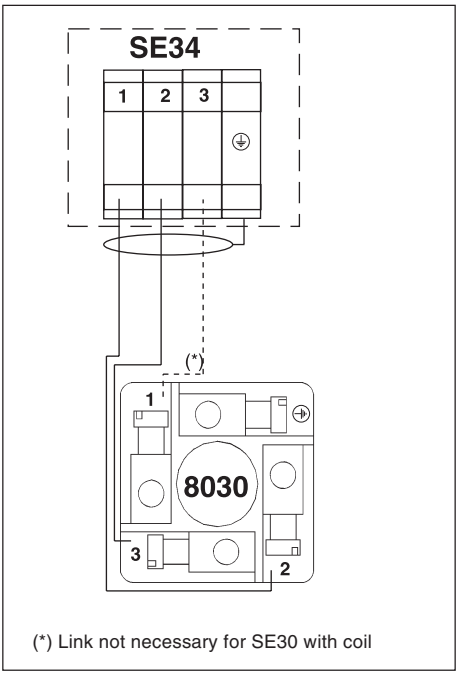


Fig. 3.5 Flow indicator SE34 separate

3.4.4 Wiring of 8030 with coil or Hall sensor "Low Power" 3 to a transmitter type 8025

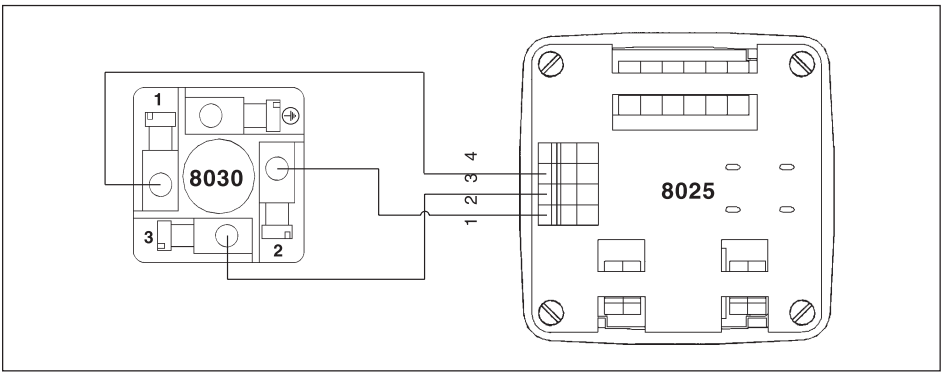


Fig. 3.6 Flow transmitter 8025 panel version

3.4.5 Wiring of a flow sensor 8030 with Hall sensor "Low-Power" or coil to a transmitter 8025 wall-mounted version

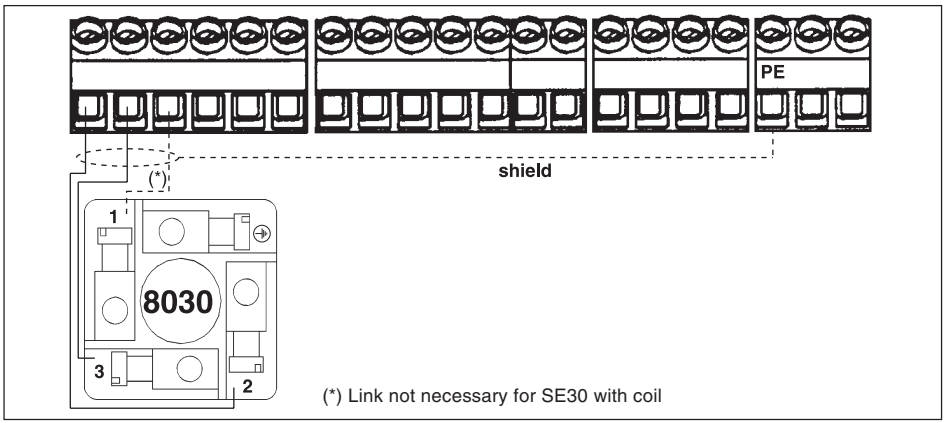


Fig. 3.7 Flow transmitter 8025 wall-mount version

3.5 Wiring of flow sensor 8030 standard with Hall Sensor to a PLC

Depending on the PLC version, use either the PNP or NPN version of the pulse output (see Fig. 3.8). The maximum cable lenth is 50 m. (see § 3.4.3).

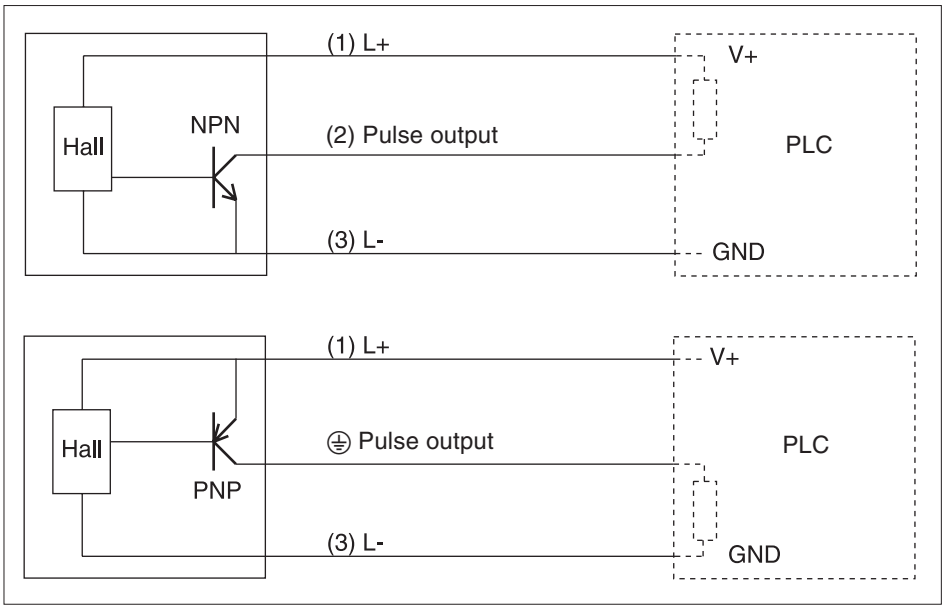


Fig. 3.8 Wiring diagram of flow sensor 8030 with Hall sensor to a PLC

3.6 Electrical wiring 8030 Hall sensor with adjustable pulse output (8021)

Unscrew central screw and remove the cover. Pull cable through PG 9 and wire according to following pin assignment. The connection to a PLC or any other device with frequency input is identical to the connection of the single sensor with Hall effect output.

1: output PNP
2: L-
3: output NPN
4: L+ (12...30 VDC)

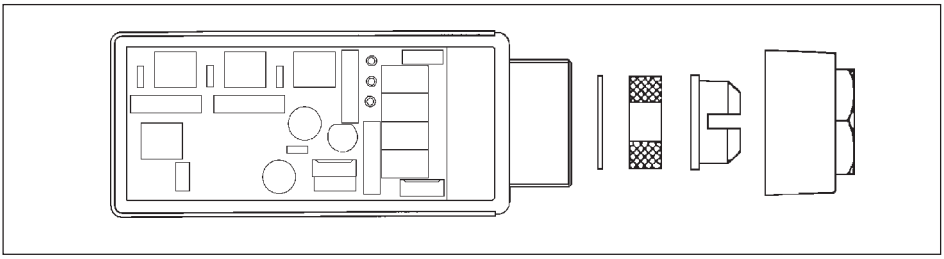


Fig. 3.9 Electrical wiring 8021

3.7 Electrical wiring 8030 Hall sensor "Low Power" with 4...20 mA output (type 8023)

Loosen central screw and take off the cover. Run the cable through the PG9 cable gland and wire up in accordance with the following pin assignment:

1: L+ (12...24VDC)
2: L-

See Appendix for examples of connections.

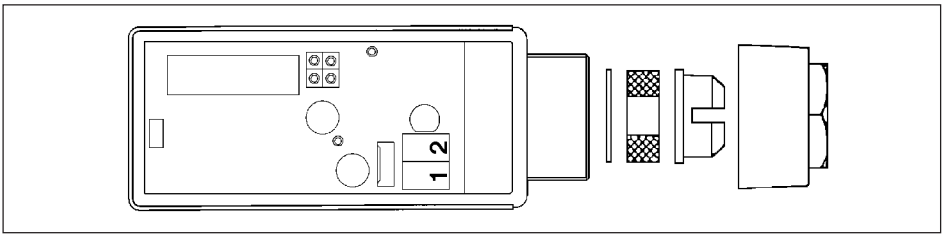


Fig. 3.10 Electrical wiring 8023

Warning: reverse connection of the polarity may damage the device !

4.1 Commissioning 8030 standard

4.1.1 Examination of fitting orifice

The size, as well as the ideal flow rate in [m/s] or [ft/s] to determine the flow volume can be defined with the nomogram (see appendix). The general flow rate lies at 2.5 m/s (8.2 ft/s). The orifice must be adapted accordingly.

For applications, with significantly varying flow rates, it is important to keep the flow rate within the permissible limits (0,3...10 m/s).

4.1.2 Flow rate determination

The sensor measures the flow volume via the frequency, which is proportional to the flow, generated by the paddle wheel.
The flow quantity Q in [l/min] or [US gal/min] is specified by the following parameters:

f = operating frequency in [Hz]
K = specific fitting factor in [pulse/l], or [pulse/US gal]

Flow quantity $\mathbf{Q = \frac{60xf}{K}}$

Example: Fitting DN 25
Pipe material PVC
Frequency: 108 Hz

The following applies for the example:
K = 52,91 pulse/l (Fig. 4.5)
The flow Q is thus calculated:

$$Q = \frac{60 \times f}{K} = \frac{60 \times 108}{52,91}$$

Q= =**122.5** l/min

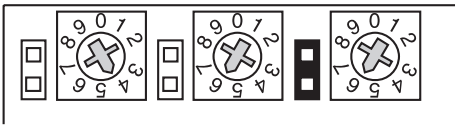
4.2 Commissioning 8030 with adjustable pulse output type 8021

The programming of the Pulse Divider requires the entry of a factor K and a multiplier D. These parameters are programmed through rotary switches and jumpers (see Fig. 4.1). To access to electronic board, unscrew central screw and remove cover.

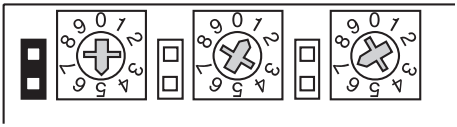
4.2.1 Programming of factor K

Enter the K-factor (pulse/litre) corresponding to fitting DN and material (refer to instruction manual type S030). To do that, set 3 rotary switches and 3 jumpers. Each rotary switch corresponds to a K- factor digit and each jumper position to a decimal point position. A K- factor from 0.000 to 999 can be programmed.

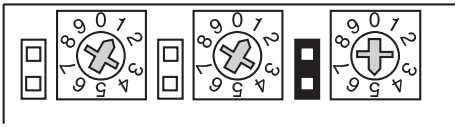
Example 1: K=46,6 puls/l (DN25 PVC)
Programming will be as follows:



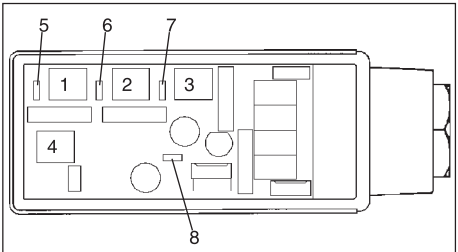
Example 2: K=0.517 puls/l (DN150 SS)
Programming will be as follows:



Example 3: K=11,46 puls/l (DN50 SS)
Programming will be as follows:



The fourth digit is not taken into account.



1, **2**, **3** rotary switches for factor K programming.

5, **6**, **7** jumpers for decimal position of factor K.

4 rotary switch for multiplier D programming.

8 reset jumper.

Fig. 4.1 Electronic board TYPE 8021

The factor K must be confirmed by a reset (short-circuit on jumper **8**).

4.2.2 Programming of multiplier coefficient D

The multiplier D is programmed with the fourth rotary switch (see Fig. 4.1). The correspondance between numbers on the rotary switch and the mutiplicator D is as follows:

Position	0	1	2	3	4	5	6	7	8	9
Coefficient D (litre/pulse)	**0.01**	**0.1**	**1**	**10**	**100**	**1000**	**10000**	**1**	**1**	**1**

The Pulse Divider generates a pulse all KxD pulses from the 8030, that is to say at all Dx1 litre. In case of previous example 1 (K= 46,6 puls/l), with a coefficient D=1, it corresponds to a pulse all 46,6 pulses from 8030, that is to say **one pulse per litre**. If in the same case D=10, it corresponds to **one pulse each 10 litres**.

Confirm the multiplier D by a reset (short-circuit on jumper **8** - Fig. 4.1).

Essential condition: the product KxD must be greater or equal to 2. If it is not the case, the Pulse Divider gives no output signal.

In order to generate a pulse all n litres (n different of basic multiplicators D).
It is necessary to program the following calculated factor K:

$$K_{calculated} = K_{standard} x (n/D)$$

where D is the first multiplier greater than n.

Example: to get a pulse all 5 litres with a standard factor K of 52,91 (DN25 PVC), the following factor K must be programmed:

$$K_{calculated} = K_{standard} x (X/D) = 52,91 x (5/10) = 26,45$$

Here D=10.

4.3 Commissioning 8030 with 4...20 mA output (type 8023) 5

Operation without type 1077-3 control unit

If used without the type 1077-3 control unit, the device measures the current flow rate and outputs the associated 4...20 mA standard signal. The adjustable values (fitting factor, 4...20 mA measuring range) can only be changed by using the control unit.

Operation with the type 1077-3 control unit

The control unit is fixed on the 8023 flow rate transmitter in place of the cover. It can be rotated 180 ° in each direction.

The voltage supply must be switched off before installing the control unit. Otherwise this can result in a reset of the program and thereby cause the flow rate transmitter to lose some functions.

Two modes are available while operating with the control unit :

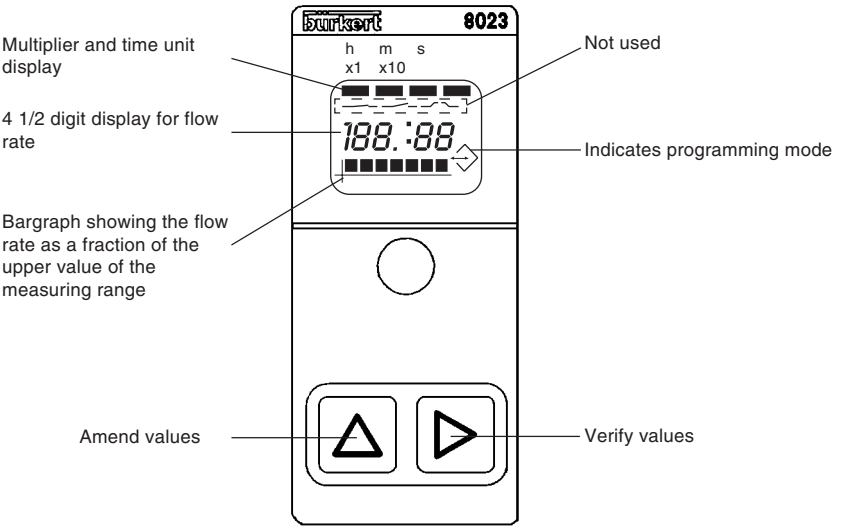
A) Programming mode

Plug in the control unit type 1077-3 . All entered data are transmitted and stored in the transmitter. After programming completion, all set data are transmitted from control unit to the flow rate transmitter. The transmitter can be operated in standard mode without the control unit.

B) Standard mode

The current flow rate is displayed and the corresponding 4...20 mA standard output signal is provided.

4.3.1 Display and Control Elements



4.3.2 Standard Mode

After the operating voltage has been switched on, all segments on the control unit light up for approx. 2 secs. (display test). Then the current flow rate is displayed and the corresponding 4...20 mA standard output signal is provided.
The standard signal range is limited by the flow rate transmitter scaling. The flow rate value assigned to respectively 4 and 20 mA must be indicated.
If one of the upper or lower limits is passed, the display will remain at its lowest or highest value and the output will be of 4 or 20 mA accordingly to the passed threshold.

When the flow rate transmitter is in standard mode, the current flow rate is displayed.

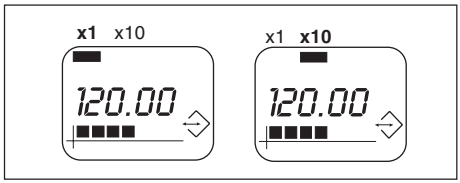
4.3.3 Programming Mode (see Fig. 4.4)

Pressing the ">" key for approx. 2 secs will switch the device into programming mode (warning : if no sensor (8030) is connected, the ">" key must be pressed for at least 8 secs). The K fitting factor, the lower and upper range values can now be set. Each item is set individually in the sequence described in the following chapter. The value flashes when it can be set. The "E" button is used to change the value.
Use the ">" key to move to the next item.
If the last item has been reached, and the ">" key has been pressed all adjustable values will be stored and the device will return to standard mode.

Note : When the system is in programming mode, the 8023 flow rate transmitter will continue to operate with the previously set values, i.e. it continues to output the current standard signal during programming mode. The reset values are only taken into consideration when the programming mode has been quit.

The Fitting Factor Multiplier (Fig. 4.2)

Since the display only permits values to be set between 0 and 199.9, a multiplier is introduced. If this is set to x10 this means that the adjustable value is multiplied internally by 10. If, for example, the fitting factor has been set at 10.45, the value set is actually 104.5. The multiplier is not displayed in standard mode.



Maximum K-Factor value: 1999.

Fig. 4.2 The fitting factor multiplier

Fitting Factor-K (see Fig. 4.4)

The fitting factor (K) adjusts the pulses generated by the paddle wheel to the electronic system. The fitting factor indicates how many pulses the paddle wheel emits per volume flow. The volume unit for the flow rate is determined by the fitting factor and does not therefore have to be given in addition. Any unit can be used (ml, l, m^3, gal, etc.).
(K-factor value: refer to the instruction manual type S030 according to fitting used).

Time Unit (see Fig. 4.3)

The time unit is selected from hours (h), minutes (m) and seconds (s).
The time unit is continuously displayed while in standard mode.

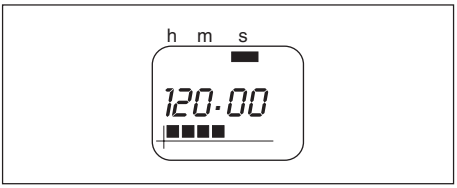


Fig. 4.3 Selecting the time unit

The Lower Range Value (4 mA)

The lower range value determines which flow rate value is allocated to the 4mA output signal. Its unit is determined by the previously set data (fitting factor and time unit).

The Upper Range Value (20 mA)

The upper range value determines which flow value is allocated to the 20 mA output signal. Its unit is the same as the lower range value. The upper range value must always be greater than the lower range value.

The control unit can be removed from the 8023 flow rate transmitter, e.g. after programming completion, without affecting the set process. The housing cover must then be placed back on the device and screwed in place.
The programmed values are stored in the flow rate transmitter.

Flow Rate Transmitter Settings on Delivery

Multiplier:	x1	Lower range value (4 mA):	0.00
Fitting factor (K):	46,6 (Pulse/l)	Upper range value (20 mA):	180.0
Time unit:	minutes (m)		

Programming the fitting Factor-K

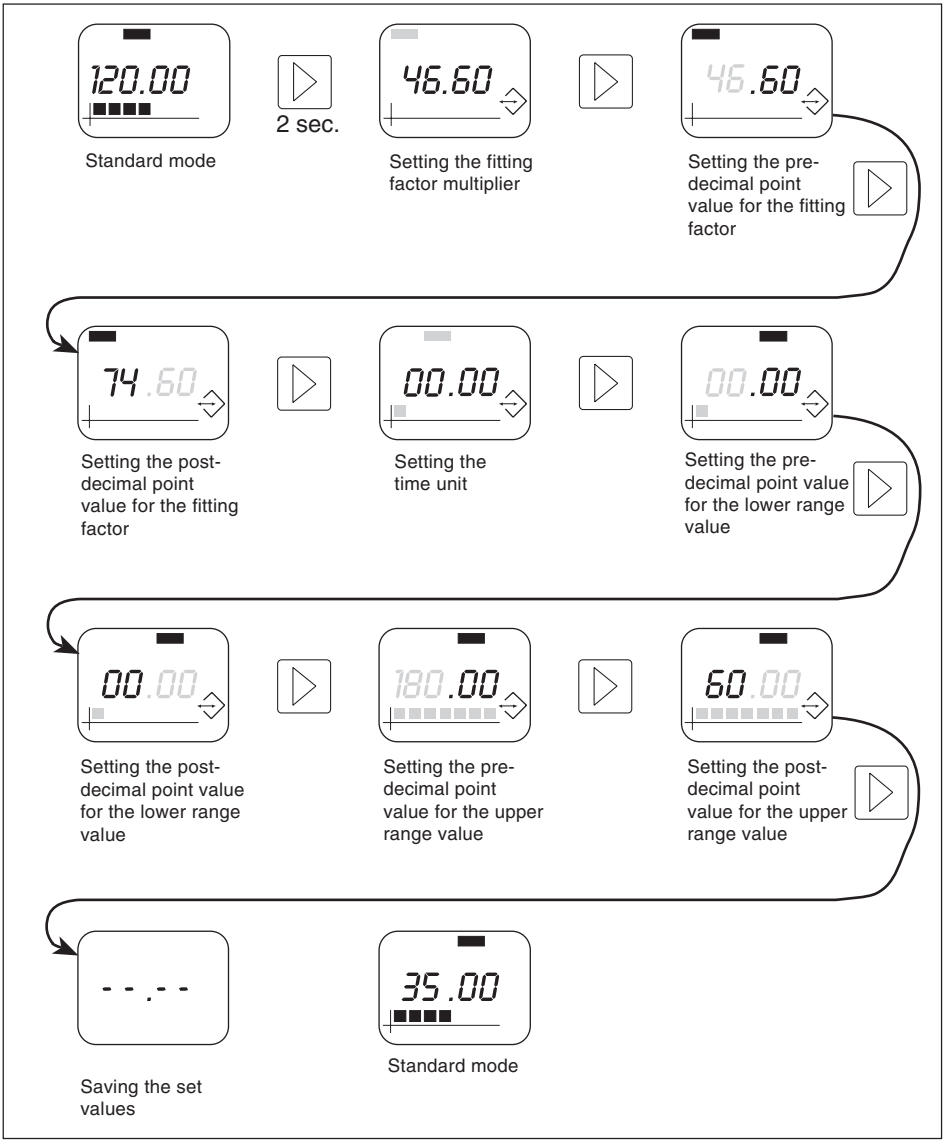
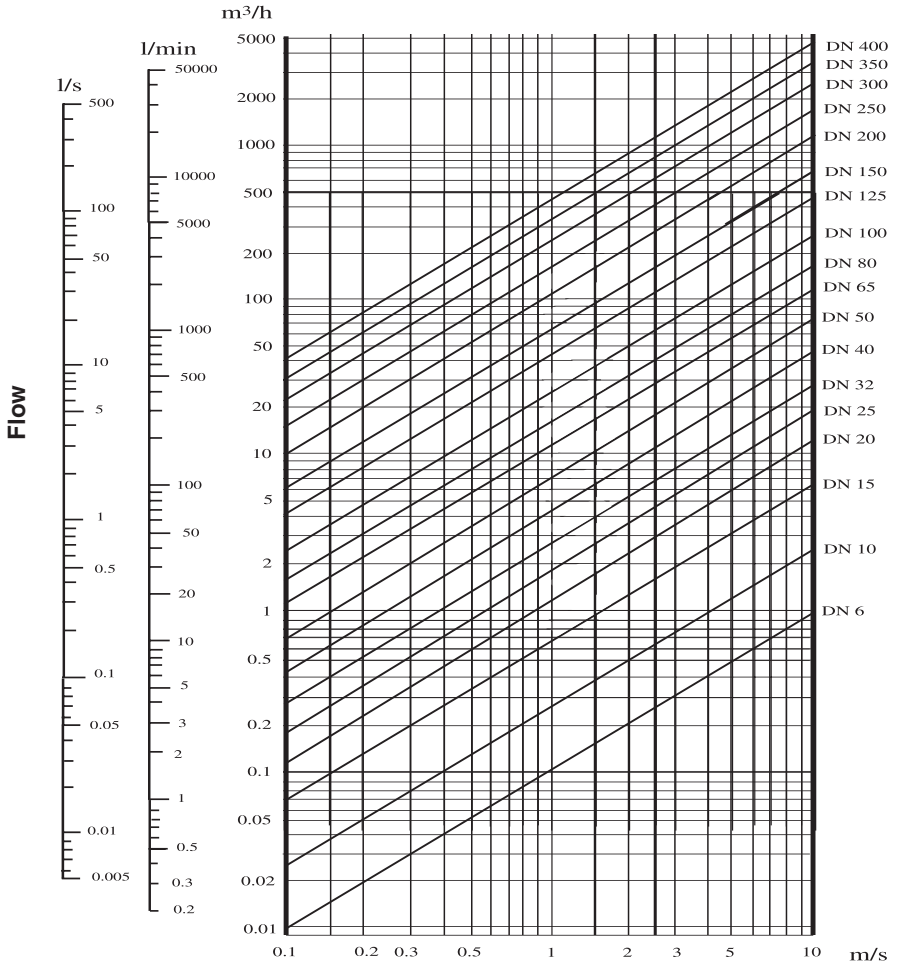


Fig. 4.4 Illustration of the various programming items

The grey numbers or symbols are the ones that are flashing and can be changed by using the "^" key.

Flow Chart (l/min, DN in mm and m/s)

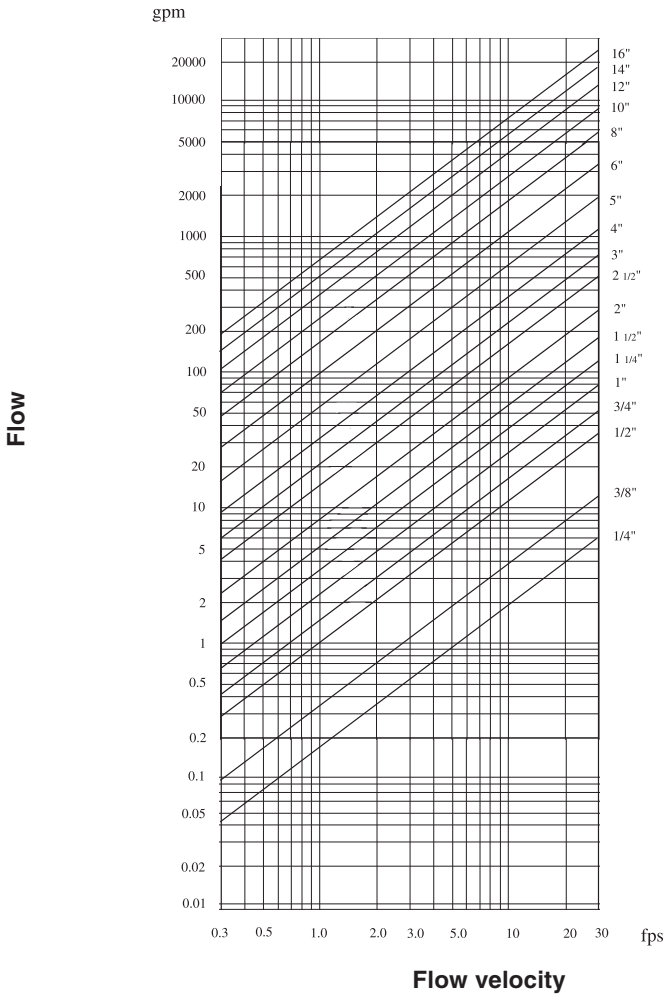


Selection Example:

Specifications:
Nominal flow: 10m³/h
Determination with
ideal flow velocity: 2...3 m/s

With these specifications, the required orifice, as defined by the flow chart is DN 40.

Flow Chart (gpm, DN in inch and fps)



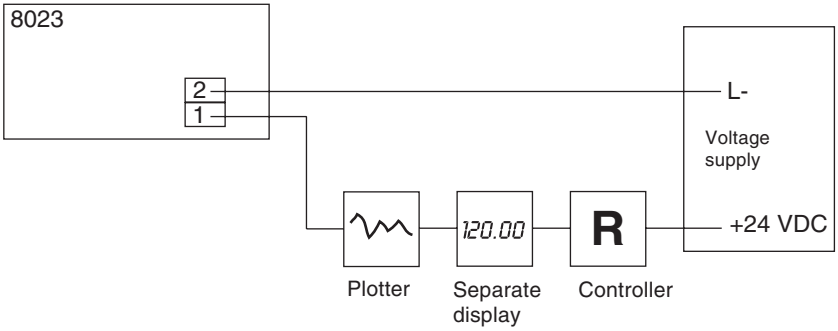
Selection Example:

Specifications:
Nominal flow: 50 gpm
Determination with
ideal flow velocity: 8 fps

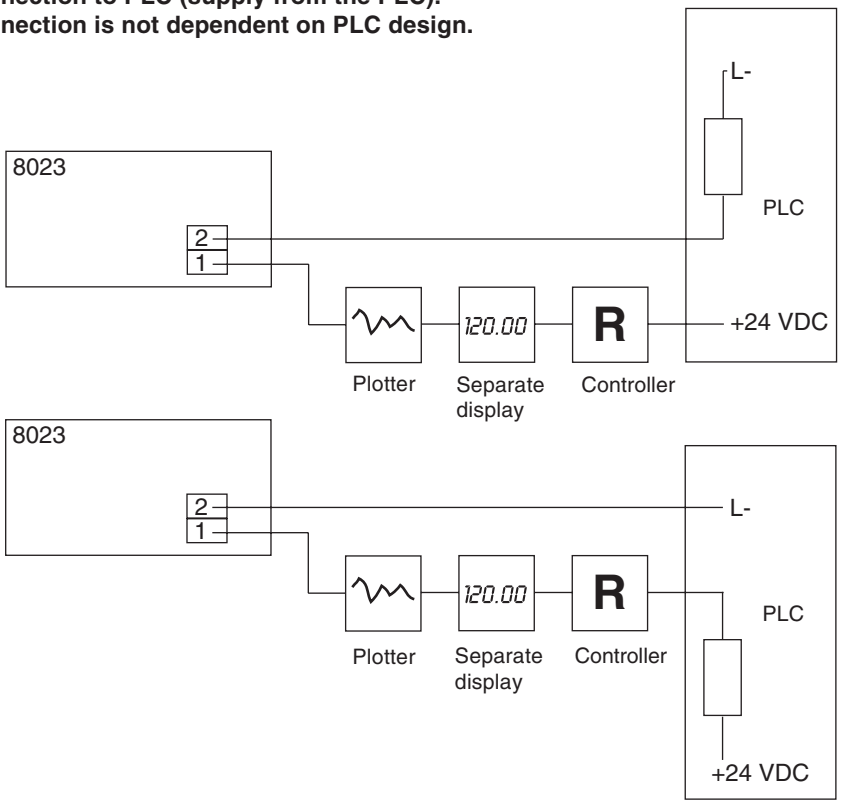
With these specifications, the required orifice, as defined by the flow chart is 1 1/2"

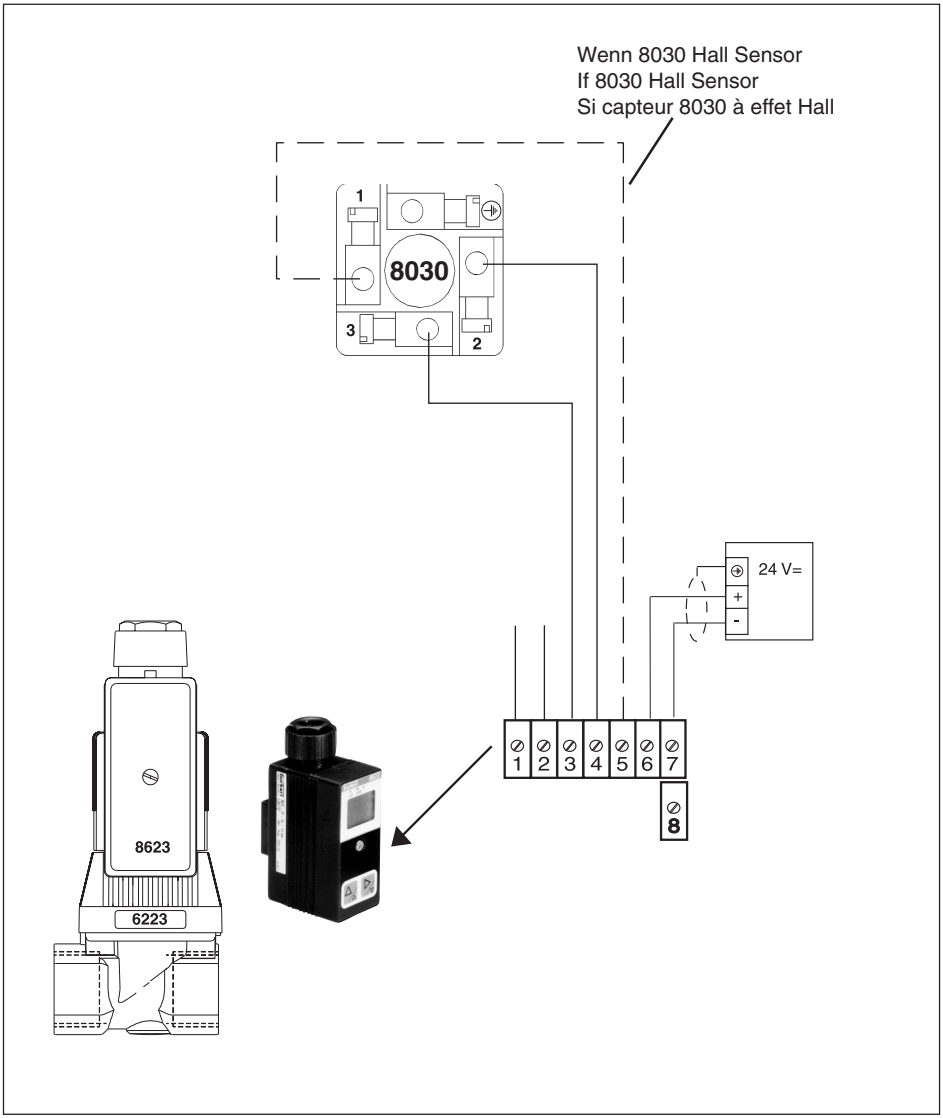
Connection examples of flow sensor type 8030 with 4...20 mA output

Connection to voltage supply and measuring equipment with 4...20 mA input (observe max. load impedance)



Connection to PLC (supply from the PLC).
Connection is not dependent on PLC design.



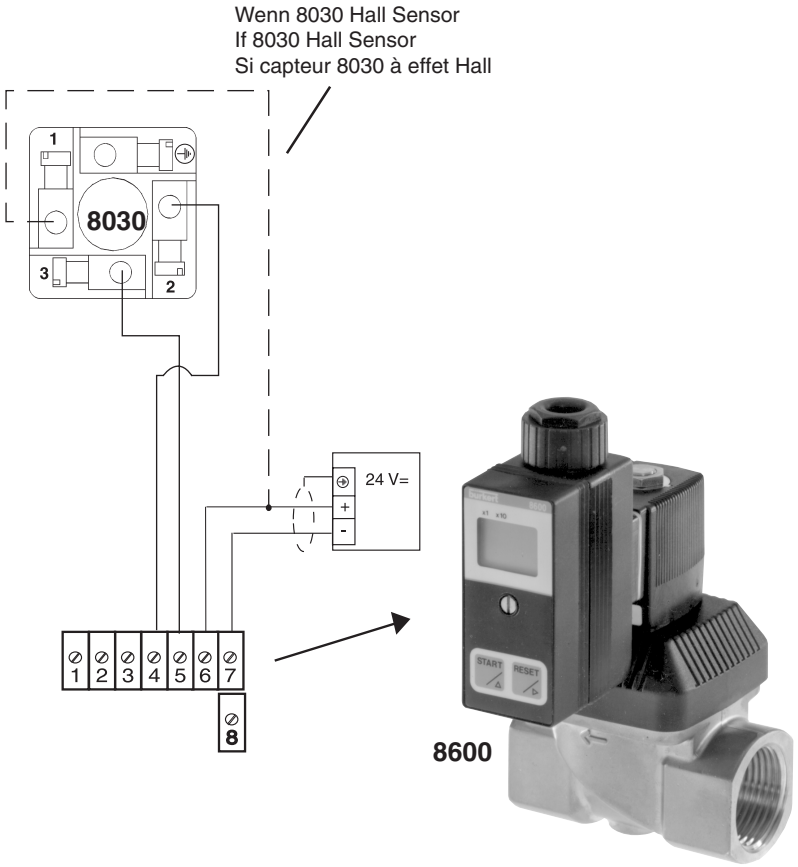


Easy - Link - Beispiel / Example / Exemple

... zwischen dem Durchfluss-Sensor Typ 8030 und dem auf einem Magnetregelventil Typ 6223 montierten Durchflussregler Typ 8623.

... between the flow sensor 8030 and the flow controller type 8623 mounted on a solenoid control valve type 6223.

... entre le capteur de débit 8030 et le contrôleur de débit 8623 monté sur une électrovanne de régulation type 6223.

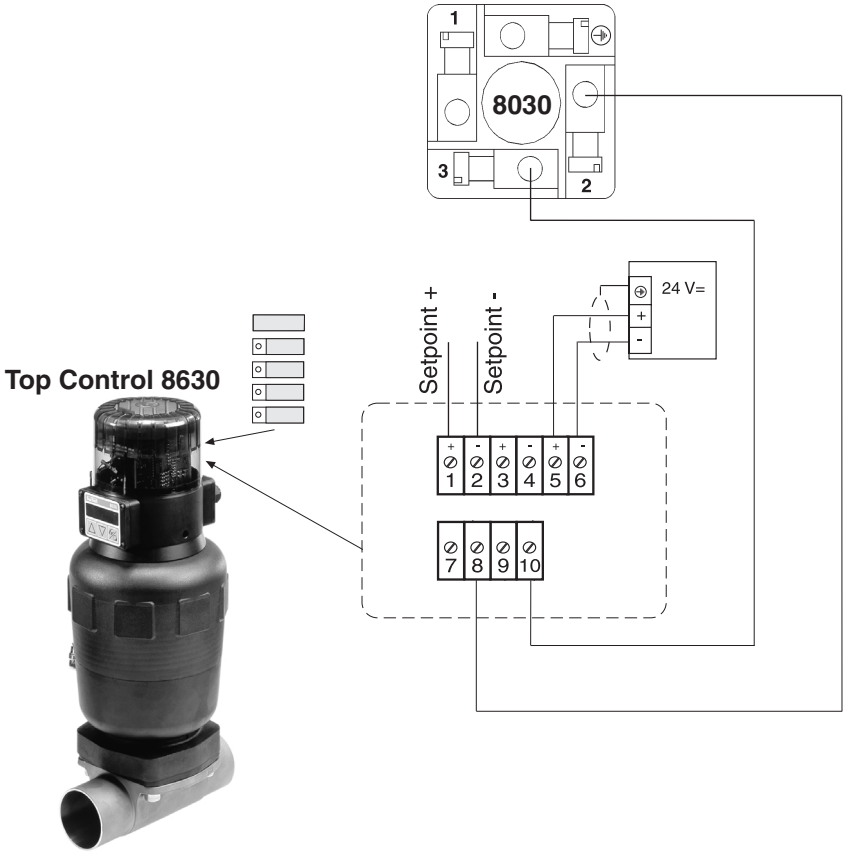


Easy - Link - Beispiel / Example / Exemple

... zwischen dem Durchfluss-Sensor Typ 8030 und dem Dosiergerät Typ 8600.

... between the flow sensor 8030 and the batch controller type 8600.

... entre le capteur de débit 8030 et le contrôleur de dosage 8600.

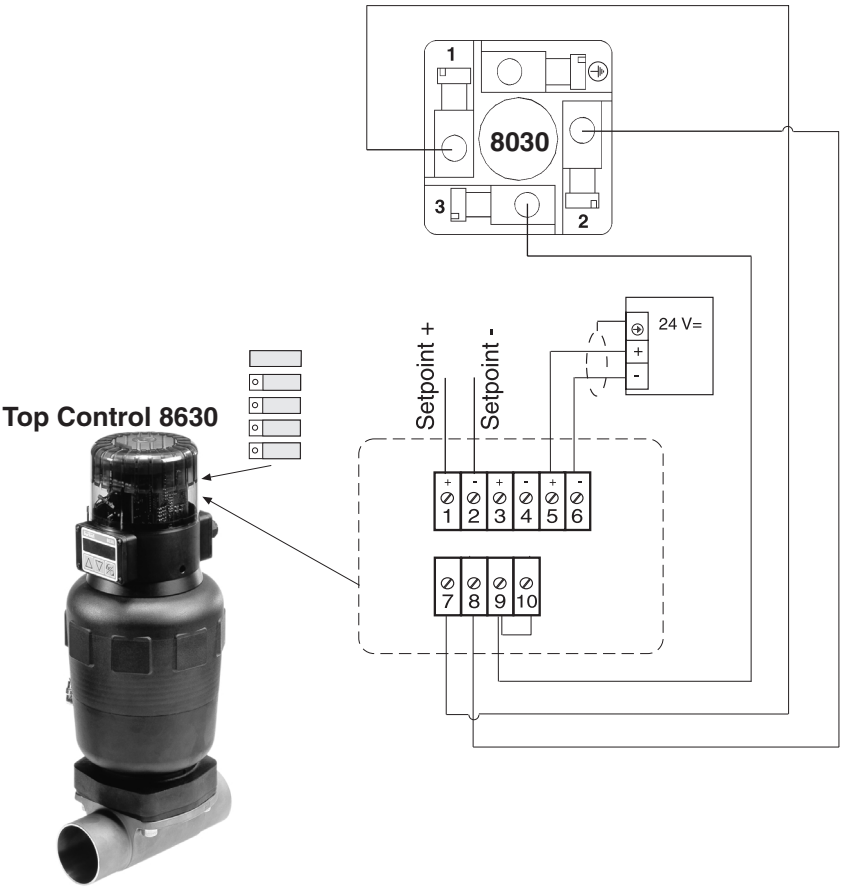


Easy - Link - Beispiel / Example / Exemple:

... zwischen dem Durchfluss-Sensor Typ 8030 mit Spule und dem auf einem Membranventil Typ 2031 montierten Top Control Typ 8630.

... between the flow sensor 8030 with coil and the Top Control type 8630 mounted on a diaphragm valve type 2031.

... entre le capteur de débit 8030 avec bobine et le Top Control 8630 monté sur une vanne à membrane type 2031.



Easy - Link - Beispiel / Example / Exemple:

... zwischen dem Hall-Durchfluss-Sensor Typ 8030 und dem auf einem Membranventil Typ 2031 montierten Top Control Typ 8630.

... between the Hall flow sensor 8030 and the Top Control type 8630 mounted on a diaphragm valve type 2031.

... entre le capteur de débit 8030 à effet Hall et le Top Control 8630 monté sur une vanne à membrane type 2031.

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