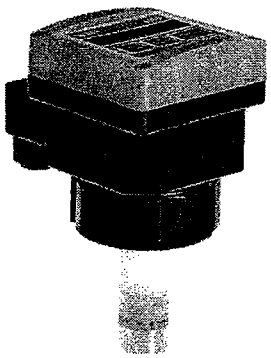
Product Information

Insertion Magflow Transmitter 8045



Satisfactory performance of magnetic inductive flow meters needs already during the engineering process important basic considerations regarding the application.

Subjects as mounting position, flow direction and appropriate up-/downstream straight runs has to be taken into account very carefully. To avoid to build up air cushions or air bubbles in the area of the flow meter, also the correct pipe design is essential for an accurate measurement.
Like all flow measurement technologies the magnetic inductive system has limits in the applications and requires for specific conditions in the fluids (e.g. degree of contamination, minimal conductivity etc.).
Very important for these instruments are the correct electrical wiring and sufficient local earth connections.

With this product information the applications and limitations for reliable measurements will be defined.
The most critical points and questions of mechanical and electrical installation will be touched and advises and recommendations for a successful mounting of the instrument will be given. It supports and assists any users of the magnetic inductive flow meter for a reliable operation without any difficulties.

Content Page

1. What is the 8045?

- Magnetic Inductive Flowmeter, insertion type

The operating principle is based on the voltage measurement between two electrodes within a magnetic field.

2. Typical applications

- Flow measurement of liquids in pipes (completely filled)
- Slightly contaminated fluids
- Fluids with a minimum conductivity of 20 µS/cm

In industries as:

- Waste engineering, water treatment
- Process technology
- Swimming pools
- Cooling water monitoring

3. Short function specs

- Measuring flow of liquids
- Measuring range: 0.05 to 10 m/s (0.15 to 32.8 fps)
- Measuring error: +/- 2% o.R. (1 to 10 m/s) with an individual works calibration or teach-in
  +/- 4% o.R. with standard mean K-factor
- Linearity: +/- (1% o.R. + 0.1% o. F.S.)
- Repeatability 0.25% of measured value
- Pressure rating: PN 6
- Conductivity: min. 20 µS/cm
- Fluid temperature: 0 to +80 °C (32 to 176 °F)
- Storage temperature: -20 to +60 °C (-4 to +140 °F)
- Operating temperature: -20 to +60 °C (-4 to +140 °F)

4. How to perform the mechanical installation?

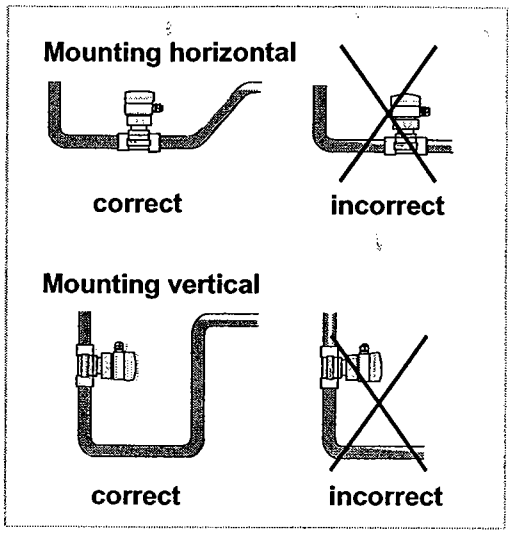
For general guidelines please also consult the instruction manual under 3.1 and 3.2.

Mounting Position

The electromagnetic flow transmitter can be mounted vertical or horizontal.

Important Note:

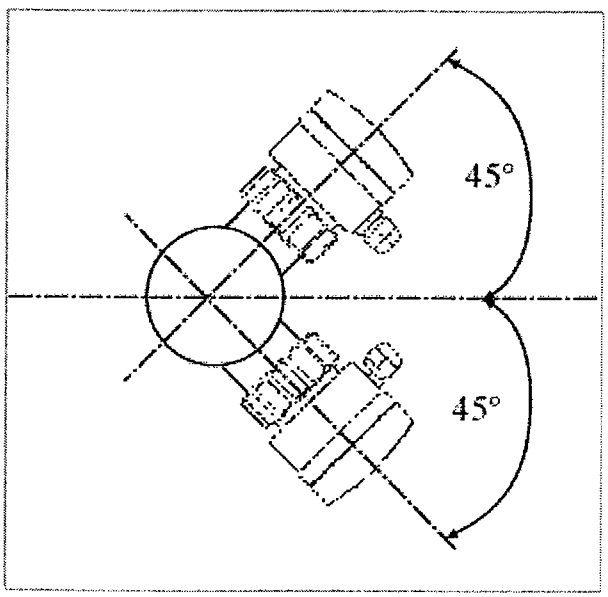
To obtain a reliable and accurate flow measurement, the piping has to be designed to ensure that the pipe is permanently full and without air bubbles.



Picture 1: Mechanical Installation

For vertical mounted transmitters the flow stream has to be in a upward direction.

It is advisable to mount the transmitter at an angle of 45° to the horizontal center line of the pipe.

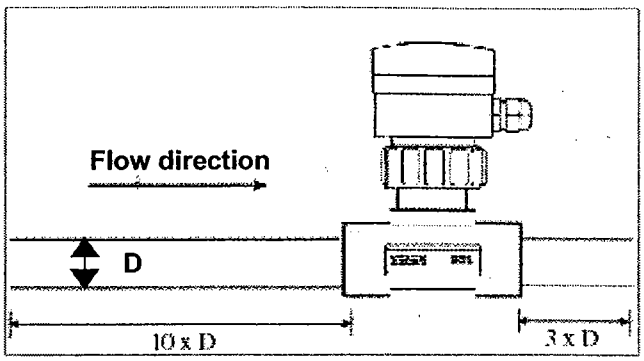


Picture 2: Mechanical Installation

Flow Direction

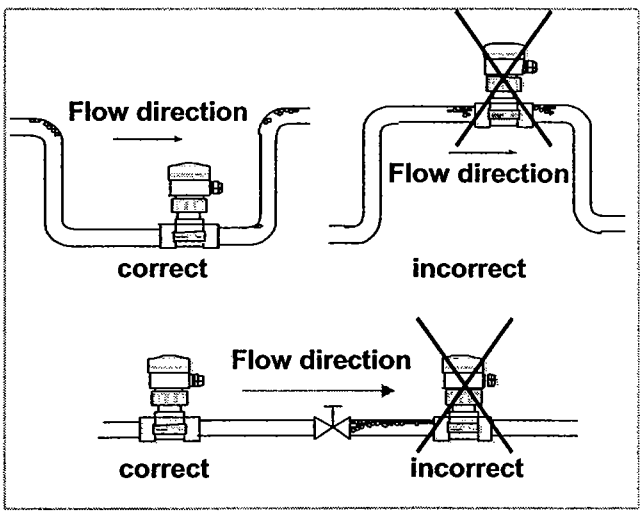
The measuring flow direction depends on the mounting direction of the transmitter.

For achieving the guaranteed accuracy results the minimum upstream (10 x D) and downstream (3 x D) straight runs must be maintained.



Picture 3: Flow direction

Please ensure that the pipe design does not allow to build up air bubbles or cavities within the medium as this will cause measuring errors.



Picture 4: Flow direction

5. How to connect electrically?

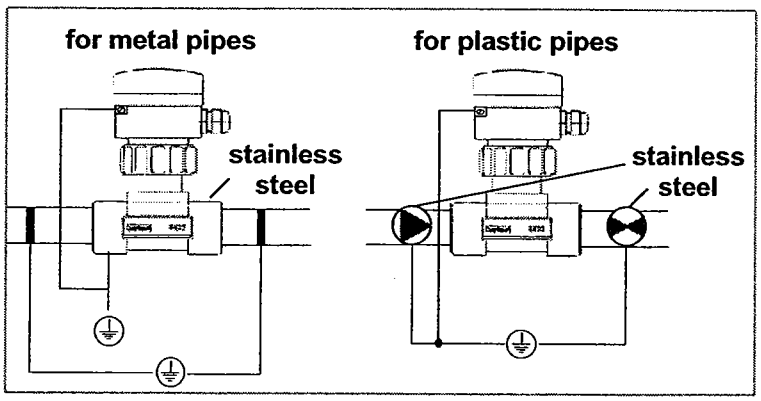
For general wiring guidelines please also consult the instruction manual under 3.3 and 3.4.

- Supply: 18 to 32 VDC (3 wire)
- Outputs: 4 to 20 mA
  (invertible, sourcing or sinking)
  alarm 22 mA
  2 relays / 3 A (optional)
- Grounding: an appropriate earth should be as close as possible to the transmitter. Proposed square section of the earth cable is minimum 4mm^2.

Examples for Grounding

For EMC purposes and measurement accuracy reasons the transmitter has to be connected to the earth correctly.
Between different earthes there may occur differences in the potential, which may influence the measurement in a negative way. To avoid this effect the various earth spots in the installation has to be connected. This procedure is necessary to eliminate the different potentials.
Special attention has to be given to plastic pipes, because there is no direct earth connection possible.

The diagram below indicates the proper way of grounding.



Picture 5: Grounding

6. Notes Approvals

EC Directrive EMC 89/336/EEC

The Bürkert product type 8045 meets the requirements of EC directive 89/336/EEC "Electro-Magnetic Compatibility" and the harmonized European standards (EN) listed in it.

The CE conformity certificates are kept for the authorities responsible according to the EC directive listed above at the following address:

Bürkert + Cie. S.a.r.l.
Triembach-au-Val
F-67220 Villé
France

Area of application

The product meets the following requirements:

Noise emission:	EN 50081-1
Noise immunity:	EN 50082-2

7. Area of application and limitations

	No difficulties	Take precautions	To check	Remarks
Flow measurement in plastic pipes		X		Make sure the transmitter is properly grounded. See chapter 5 in the product information
Minimum fluid conductivity			X	Minimal conductivity is 20 µS/cm
Fluctuating fluid conductivity		X		Change process concept to avoid fluctuating conductivity Change measuring principle
Heavy turbulent flow profile		X	X	Use a flow straightener Change position of the flow transmitter
Coating fluids		X		Set up maintenance procedure

8. Filter function and selection

The filter function provides a damping effect to prevent fluctuation within the output current and display. There are 2 types of filters, fast and slow. Each has 10 levels of damping available from 0 to 9 (0 having no damping effect).

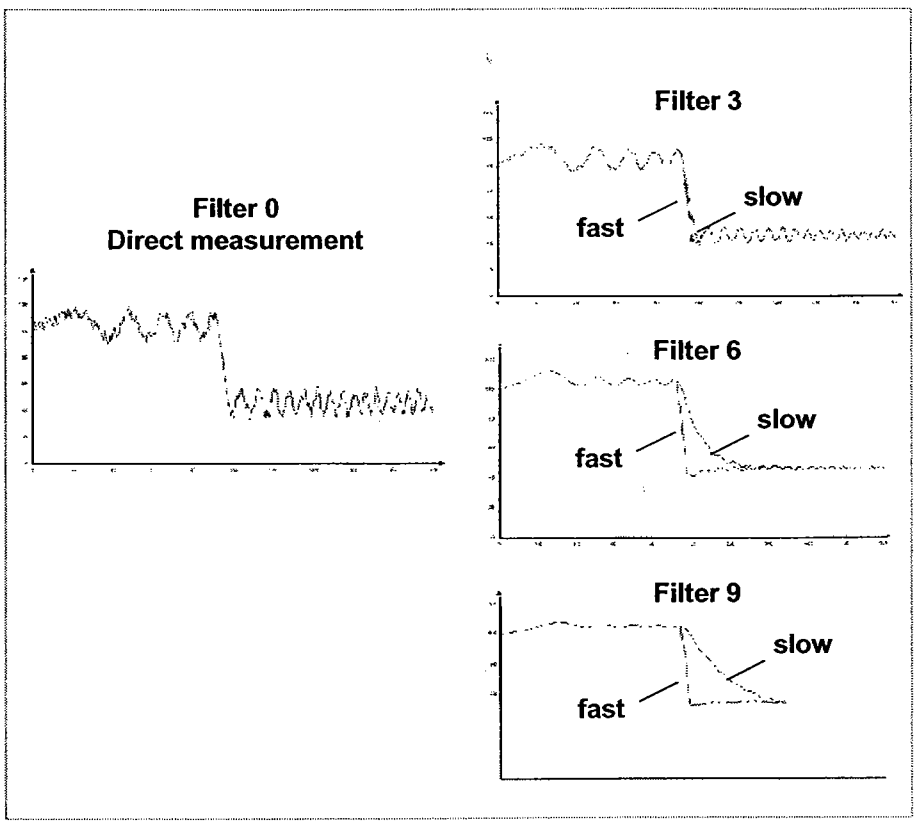
Fast Filter

Is used if rapid changes within the varying flow may occur. (In cases of quick valve shut off, the slow filter will take a few seconds to reach zero, while the fast filter will react immediately).

Slow Filter

May be used in bad measuring conditions (e.g. in case of electrical or magnetical interference, earthing problems, air bubbles in the fluid, hard fluctuating flow, etc.)

The diagrams below shows the influence on the different filters to the flow output signal:



Picture 6: Effects of filters

9. Trouble shooting	Faults	Status	Actions
The transmitter does not work	Transmitter connected?	No	Connect the device
	Power supply on terminal + and – OK?	No	Check the connection
	Power supply between 18 and 30 VDC?	No	Change power supply
	Power supply regulated (oscillation rate < 5%)?	No	Change power supply
	Fuse OK (if any)?	No	Change the fuses
	Switch ON (if any)?	No	Set the switch ON
Transmitter programming/testing unavailable	Internal switch 2 "locked"?	Yes	Set switch 2 down
Display "ERROR" – output current 22 mA	Display at the start-up (EEPROM failure)?	Yes	Restart the device
	ERROR at each start-up?	Yes	Return the device
	Display after each validation of the menu (EEPROM failure)?	Yes	Configure the device again
	Failure at each validation of the menu?	Yes	Return the device
Fluctuating display	Inappropriate filter?	Yes	Increase the filter or select slow mode filtering
	Air bubbles in the fluid?	Yes	Set slow mode filtering
	The electrodes are dirty?	Yes	Clean the electrodes
	Are the electrodes passivated?	No	Install the transmitter into the fluid 24hours before use
	Is the flow rapidly fluctuating?	Yes	Transmitter is not suited for the application
Earth connection	Is the earth good connected? (No noise on the earth line)	No	Use a non disturbed earth
	Are metal pipes connected to the earth?	No	Connect the pipes to earth
Flow measurement incorrect	Correct K-factor?	No	Enter the correct coefficient or determine via teach-in
	The flow has stopped and the display does not equal zero?	Yes	Perform a zero point calibration
Current output value	Switch 1 correctly set (sinking or sourcing)?	No	Select appropriate position
	Connection of the current output OK?	No	Reconnect the current output
Fixed current output value	Parameters for current output OK?	No	Program the current output
The relays do not work	Parameters OK?	No	Program the relay outputs
	Relay correctly connected?	No	Connect relays
	Connection of relays 1 and 2 inverted?	Yes	Connect relays accordingly
	Protection fuses for the relays OK (if any)?	No	Change the fuses
	Relay switches ON (if any)?	No	Switch ON

10. Frequently asked questions (FAQs)

Can we upgrade a paddle wheel measuring system into a magmeter system?

Yes, it is possible. The magmeter type 8045 is fully compatible with the paddle wheel type 8025 and fits into the same fitting. Even an inline paddle wheel can be easily upgraded into a magmeter. This can be done by a special adapter screwed in place of the inline paddle holder. This modularity enables to upgrade, with low costs, any Bürkert measuring system, if the fluid characteristic changes.

How can we perform batch control with the 8045?

The 8045 magmeter is equipped with an individual scalable pulse output which can be connected to a panel or wall mount batch controller 8025 instead of a sensor 8020 or 8030. This enables to perform the dosing of difficult fluids at a reasonable price.

Can we use the magmeter in fluids containing air bubbles?

Each application has to be considered separately. Normally, air bubbles in the liquid can false the measurement and lead to fluctuating display and output current. In cases of low air bubbles contents, the special filter function helps to improve the reliability and stability of the measurement.

How can we be sure of the measurement accuracy?

Each sensor is individually and in real conditions factory tested. A correction factor is labeled on the product. This coefficient is applied to the standard K-factor. This test is certified on the backside of the instruction manual delivered with the product. Additionally, the product integrates the advanced teach-in function, enabling to determine an application specific K-factor for even more accuracy.

11. Additional information and documentation

For additional information and details, please also consult the following Bürkert product documentation:

1. Data sheets, Telesales catalogue
2. Instruction manual
3. Training documents, mailers, technical articles