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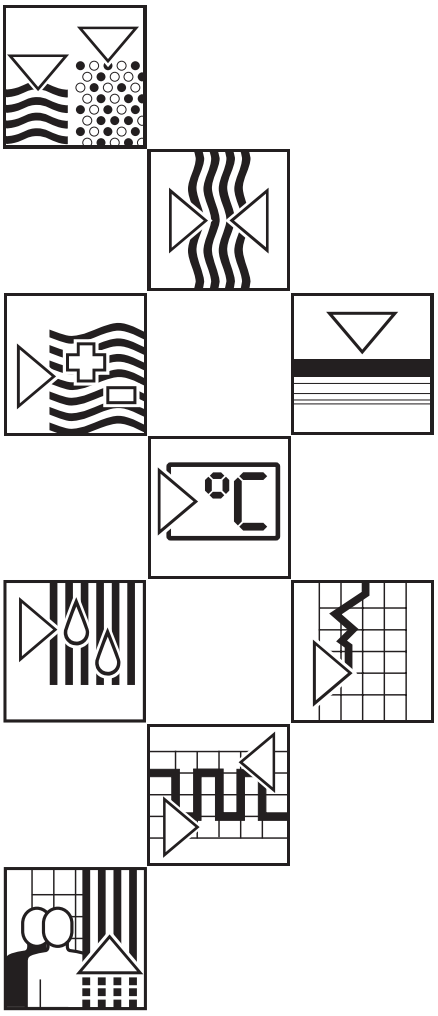
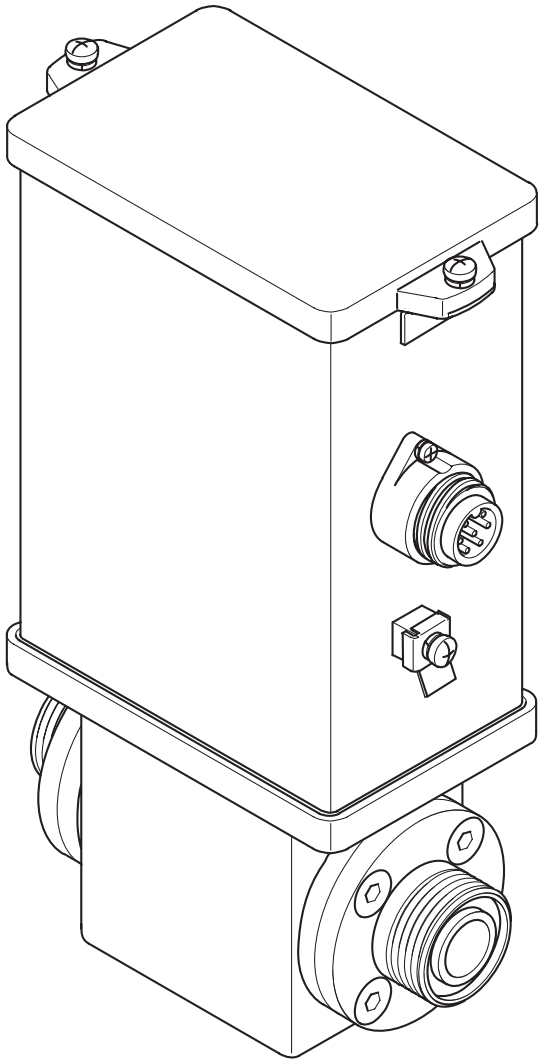
V1.00.XX

dosimag A
Electromagnetic Flow Measuring System

Operating Manual





Endress+Hauser

Nothing beats know-how

Safety Instructions

The following safety instructions must be carefully observed!

Correct Usage

- The Dosimag A flowmeter may only be used to measure the flow of conductive liquids.
- The Dosimag A flowmeter is designed and checked according to the regulations in force EN 61010 (corresponding to VDE 0411, “Safety requirements for electrical equipment for measurement, control and laboratory use”). A hazardous situation may occur if the flowmeter is not used for the purpose it was designed or is used incorrectly.

  For this reason, please note the information provided in this Operating Manual indicated by these pictograms:

- The manufacturer assumes no liability for damage caused by incorrect use of the instrument.

Personnel for Installation, Start-up and Operation

- Mounting, electrical installation, start-up and maintenance of the instrument may only be carried out by trained personnel authorised by the operator of the facility. Personnel must read and understand this Operating Manual and follow its instructions.
- The instrument may only be operated by personnel who are authorised and trained by the operator of the facility. All instructions in this manual are to be observed.
- For special fluids, including those used for cleaning, E+H will be pleased to supply information concerning the chemical resistance properties of wetted parts.
- Ensure that the measuring system is correctly wired up according to the wiring diagrams. The measuring system is to be grounded.

Repairs, Hazardous Materials

The following procedures must be carried out before a Dosimag A flowmeter is sent to Endress+Hauser for repair:

- In every case, a note must be enclosed with the instrument, containing a description of the fault, the application and the chemical and physical properties of the product being measured.
- Remove all residue which may be present. Pay special attention to the gasket grooves and crevices where fluid may be present. This is especially important if the fluid is dangerous to health, e.g. corrosive, poisonous, carcinogenic, radioactive, etc.
- No instrument should be returned to us without all dangerous material being removed first (e.g. in scratches or diffused through plastic).

Incomplete cleaning of the instrument may result in waste disposal or cause harm to personnel (burns, etc.). Any costs arising from this will be charged to the owner of the instrument.

Technical Improvements

In order to keep pace with development progress, the manufacturer reserves the right to modify technical data without special notice.
Your local E+H Sales Office will supply you with all current information and any updates to this Operating Manual.

Contents

1. System Description

1.1 Areas of application

The specially-developed Dosimag A field system is particularly suitable for the measurement of dynamic processes in a pipeline, e.g. dosing, rapid control, measurement after dosing or piston pumps, pulsing flows as well as short start/stop measurements in the filling industry. The Dosimag A electromagnetic measuring system fulfils the following requirements:

- short batch time
- high reproducibility
- easy cleaning
- compact design
- simple replacement

The Dosimag A operates on the electromagnetic measurement principle.
It enables liquids to be measured which have a minimum conductivity of 5 µS/cm. These include home domestic products such as cleaning agents, body lotions such as shampoo and liquid soap, car maintenance fluids such as antifreeze, and foodstuffs such as yoghurt, ketchup and mayonnaise. Foodstuffs are not physically altered and their molecular structure remains unchanged.

1.2 Principle of measurement

In accordance with Faraday's law of induction, a voltage is induced in a conductor that is moved through a magnetic field. In the magneto-inductive principle of measurement, the flowing medium represents the moving conductor. The induced voltage is proportional to the flow velocity and is fed to the measuring amplifier by a pair of electrodes. The flow volume is calculated from the cross-section of the pipe.
The DC magnetic field is generated by a switched direct current of alternating polarity. Together with the patented "Integrating Autozero Circuit", this assures a stable zero point and makes measurement independent of the fluid and insensitive to entrained solid particles.

$$Ue = B \cdot L \cdot v$$
$$Q = v \cdot A$$

Ue = induced voltage
B = magnetic induction (magnetic field)
L = distance between electrodes
v = flow velocity
Q = volume flow
A = pipe cross-section

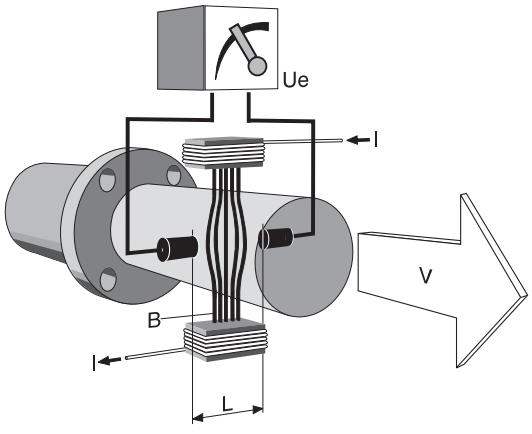
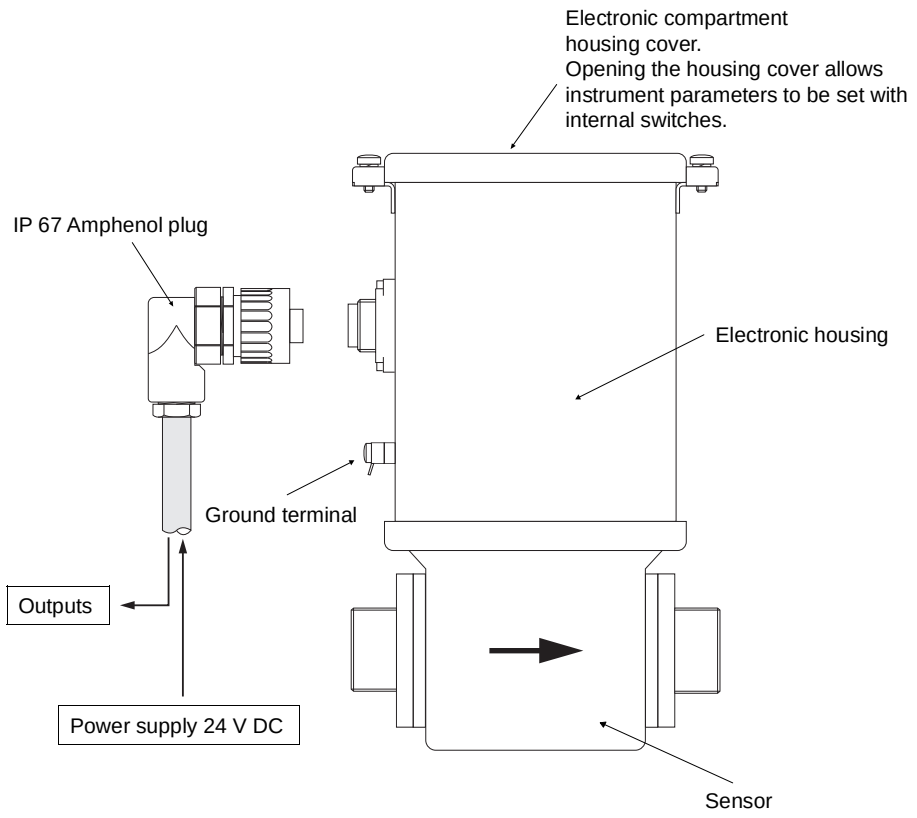


Fig. 1:
Principle of electromagnetic flow measurement

1.3 Design of the measuring system

The following illustration gives an overview of the Dosimag A measuring system.



Pulse/frequency output:	Open Collector, passive 0...10 kHz
Status output:	Open Collector, passive ⇒ indication of system and process errors

The outputs are galvanically isolated from one another and from power supply.
Technical data see Page 25.

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Fig. 2:
Design of the measuring system

1.4 Operation

Inside the housing there are miniature switches with which the following six system parameters can be set (see Page 15):

- Selection of volume units for the pulse output (ml or fluid ounces)
- Noise suppression (on/off)
- Pressure pulse suppression (on/off)
- Sampling rate (55 or 83 per second)
- Creep suppression (on/off)
- Pulse value or frequency output

1.5 Safety

The measuring systems comprehensive self-monitoring assures maximum safety. Any error messages (power failure, process error, system error) are emitted at the status output.

- The Dosimag measuring system complies with the requirements for electromagnetic compatibility (EMC) as per CE (EN 50081-1-2 and EN 50082-1-2).
- Protection type IP 67 (EN 60529)/NEMA 4X is standard (also with unplugged Amphenol connector).
- The Dosimag measuring system complies with the requirements of European Standard EN 61010.

1.6 Calibration

The Dosimag A is available in two versions:

Standard version
Applications which need high reproducibility, e.g. filling processes (repetitive, short-cycle filling of a container), require no absolute scaling of the pulse output, as filling machine a while also finding the mechanical tolerances of valves when adjusting to the set volume.

Option calibration
A 0.5% calibration option is offered for those applications requiring an absolute measuring accuracy (e.g. adding disinfectant to a rinsing tub).

	Standard version	**Option calibration**
Absolute value	typical ±5% o.r.	±0.5% o.r. ±0.01% o.f.s.
Reproducibility	standard deviation: ± 0.1% at >5s batching time	standard deviation: ±0.1% at >5s batching time
	Detailed specifications see Page 29	Detailed specifications see Page 29

1.7 Approvals

For the aseptic version (flat seal), the Dosimag A has two approvals:

- 3A (Sanitary Standards Symbol Administrative Council Application)
- SK 344-001 (Beverage approval of the German beverage dispensing equipment regulation)

The respective approval symbols are shown on the nameplate.

Note!
The CE mark is always applied.
The SK number is only applied on european versions.


Note!

2. Mounting and Installation

Caution!
The instructions given in this section on
• Protection type
• Temperature ranges
• Mounting
are to be observed in order to ensure safe operation of the measuring system.

2.1 Protection type IP 67 (EN 60529)/NEMA 4X

Dosimag A fulfils all the requirements of IP 67. After successful installation in the field or after replacing the instrument the following points must be observed in order to guarantee IP 67 protection:

Gaskets
Housing gaskets must be clean and undamaged when inserted in the gasket groove. The gaskets may need to be dried, cleaned or replaced.

Screws
Both housing cover screws must be firmly tightened.

Amphenol plug
The cable used for the Amphenol plug must have an outer diameter of 8...10 mm. Tighten the cable gland and Amphenol plug firmly.

The cable must loop down before the connection to the Amphenol plug. This prevents moisture from entering the plug.

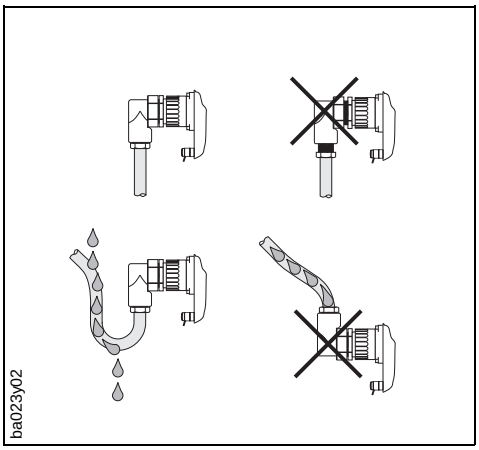


Fig. 3:
Mounting using Amphenol plug

Note the sequence when connecting the cable to the Amphenol plug:

1. 90° cable housing
2. Rubber gasket
3. Cable restraint
4. Cable gland
5. Connection piece
6. Plug

Caution!
The screw connections must be firmly tightened in order to guarantee IP 67 protection of the Amphenol plug.

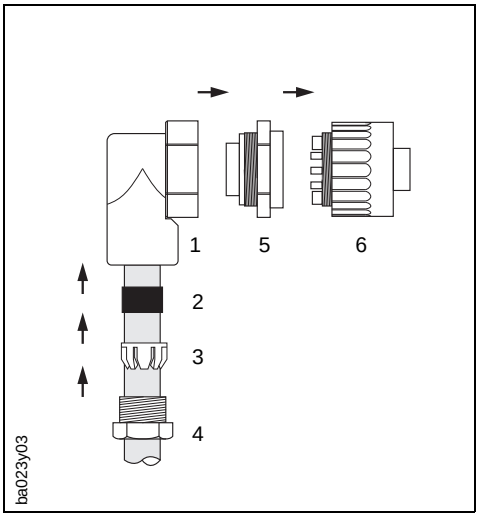


Fig. 4:
Procedure for installing the Amphenol plug

2.2 Air connection

The Dosimag A has IP 67 protection type as standard, and therefore no additional measures are required regarding sealing. There is the possibility, however, of air purging the Dosimag A.

Air mechanical connection
The connection is via an internal G1⁄8" thread, into which the fitting may be threaded to a maximum depth of 10 mm.

Air pressure and quality
The Dosimag can be purged with a maximum pressure of 0.5 bar gage. At higher pressure there is a danger of destroying electronic components. Since the electronic components are sensitive to dirt and humidity, only pure instrument air may be used.

IP 67 protection type

Warning!
To guarantee IP 67 protection type, with the use of the air connection, the device must be continuously purged, and the Amphenol connector must be plugged in (purged connector). If the air supply ceases, IP 67 protection type is not guaranteed.

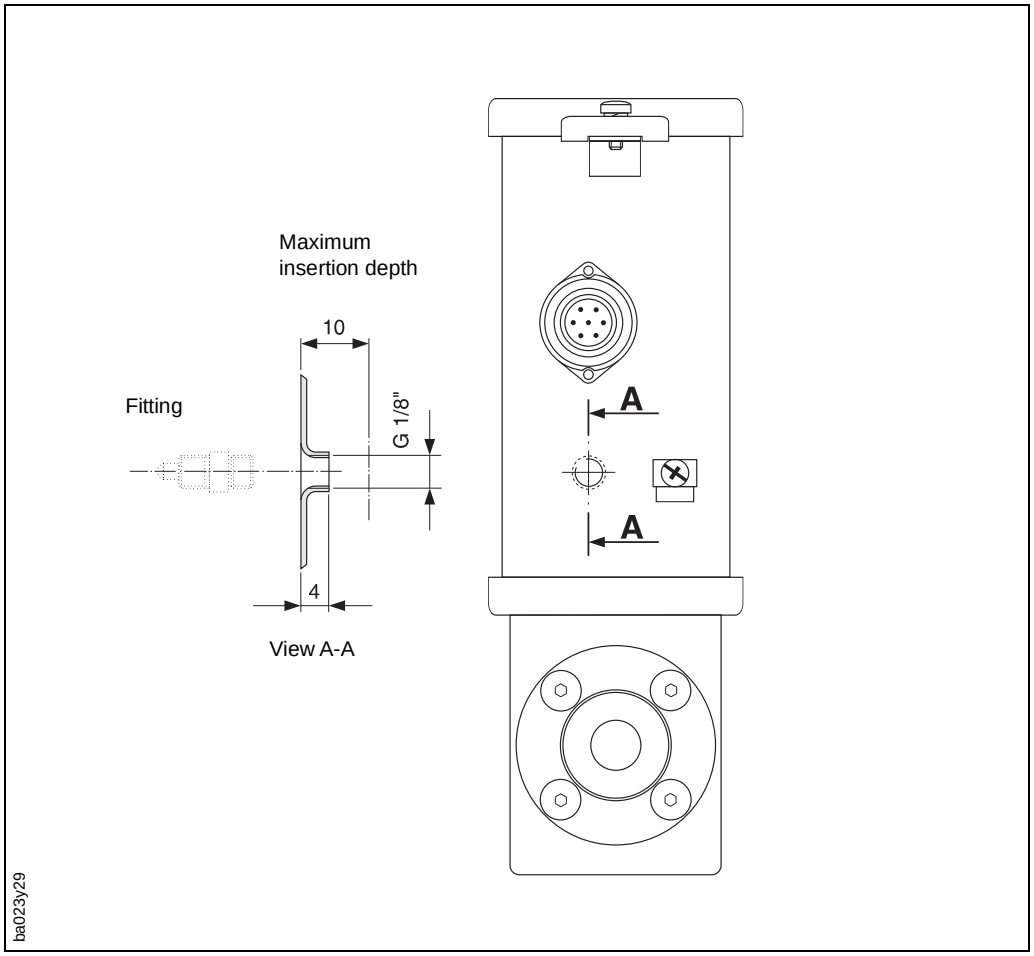


Fig. 5:
Air purge connection

2.3 Temperature ranges

The maximum approved ambient and fluid temperatures must be observed (see Page 27, 28).

2.4 Mounting guide lines

High accuracy or reproducibility can only be ensured if the piping is completely filled (air bubbles in the product will produce measuring errors). Pumps must always be mounted upstream of the measuring system.

The preferred mounting position is vertical. In this position the entrained solids sink and fatty components in the stationary fluid rise away from the measuring electrodes.

A:
When installing in rising piping, ensure that the shut-off valve is mounted upstream of the Dosimag A.

B:
When installing in falling piping, ensure that the shut-off valve is mounted downstream of the Dosimag A in order to prevent the flowmeter running empty.

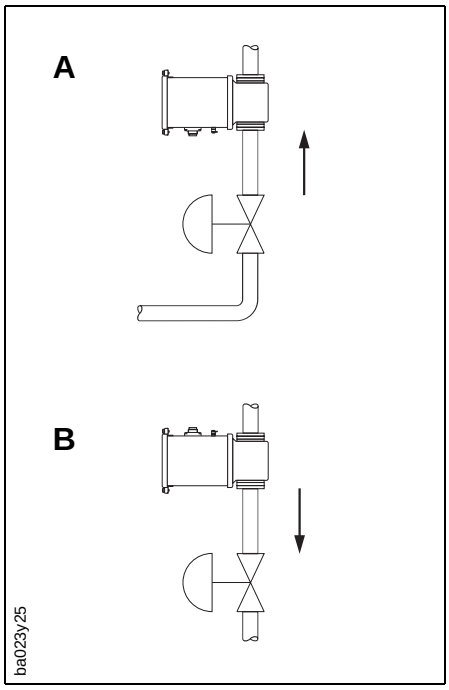


Fig. 6:
Installation in rising/falling piping

C:
If horizontal mounting is required, the axis of the electrodes must be horizontal (see Page 13).
This prevents brief insulation of the electrodes by entrained air bubbles.
Ensure that the shut-off valve is mounted behind Dosimag A.

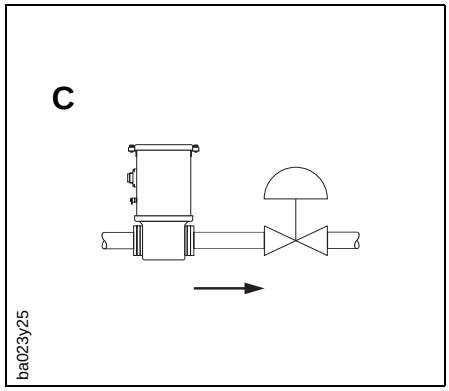


Fig. 7:
Installation in horizontal piping

2.5 Mounting the sensor

The process connections are screwed on either directly onto the 1" threaded stub (Tri-Clamp®), or with a skirted nut.

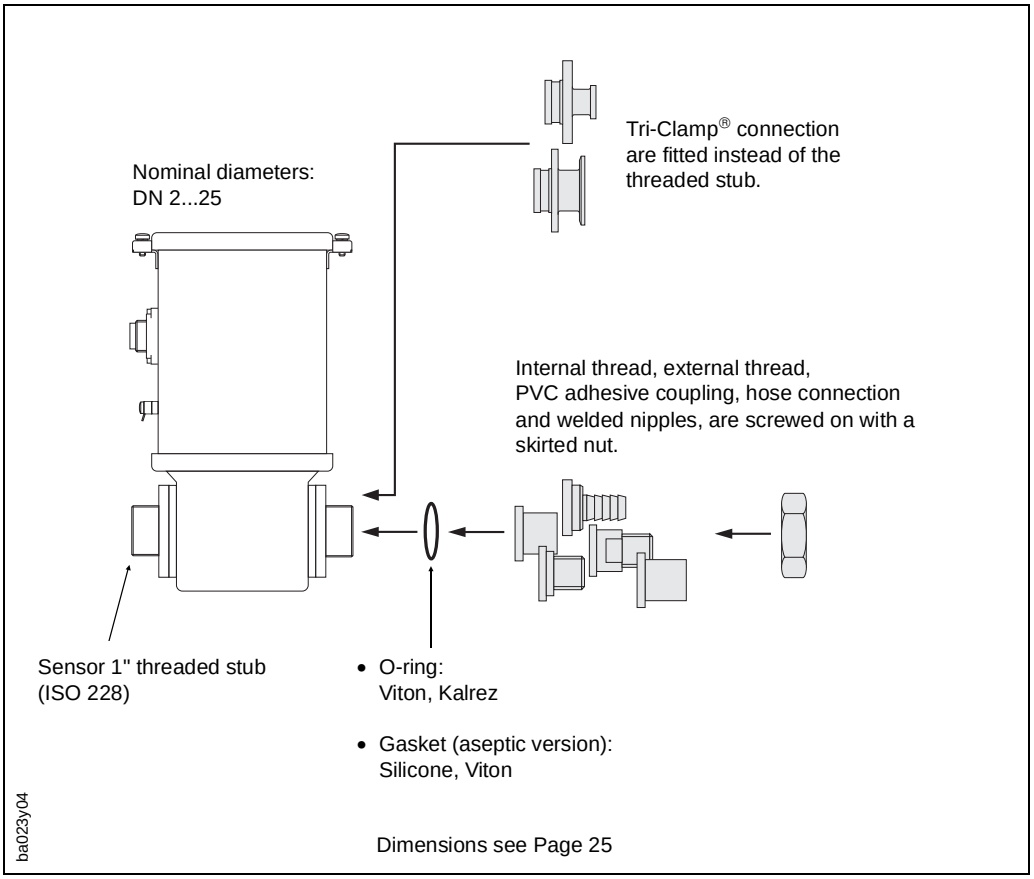


Fig. 8:
Types of sensor connection

Screw tightening torques and gaskets

When screwing on the process connections (right to the stop) the O-ring or the flat gasket is pressed completely into the sealing groove of the threaded stub.

Wall mounting for Dosimag A

Note!

Note!
If wall mounting of Dosimag A is required, a separate wall mounting set is available at E+H.

2.6 Electrical connection

Warning!
Do not install, wire up or disassemble when the unit is connected to a power supply.
Observe both polarity and the operating voltage.

Wiring diagram

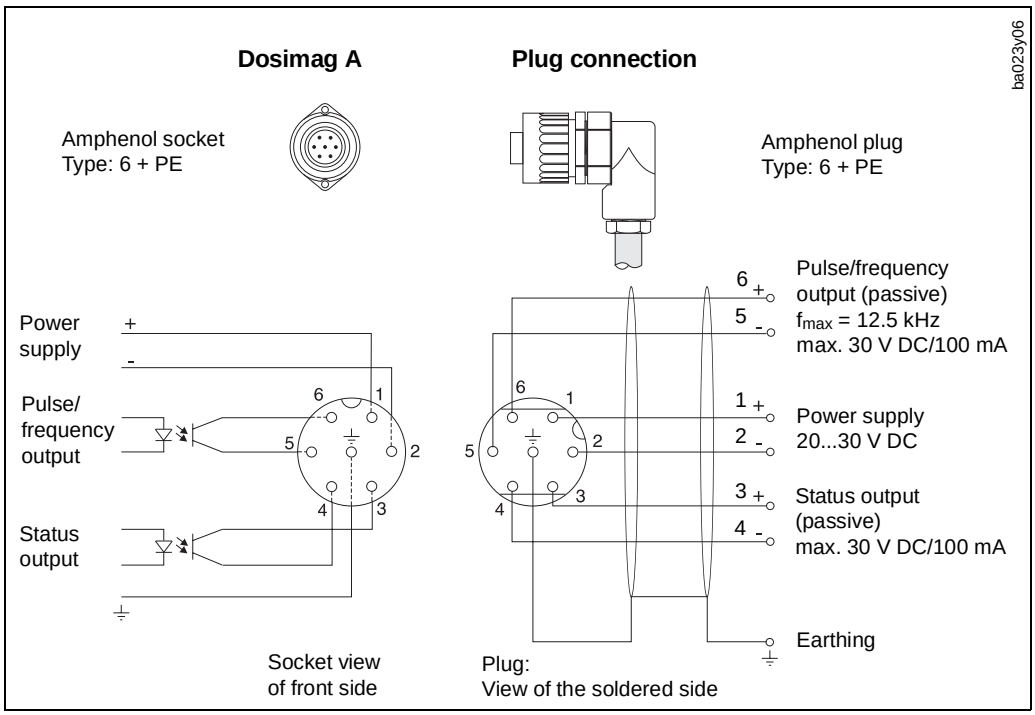


Fig. 9:
Electrical connection diagram

Wiring and cable specifications

Cable gland: PG 9 (cable diameter 8...10 mm)
Type of connection: solder
crimp (with air connection option)

Cable cross-section		
solder	min. 0.15 mm^2 AWG 26*	max. 0.75 mm^2 AWG 18*
crimp (with air connection option)	min. 0.5 mm^2 AWG 20*	max. 1.5 mm^2 AWG 16*

* = American Wire Gauge

It is recommended that only shielded cables should be used.

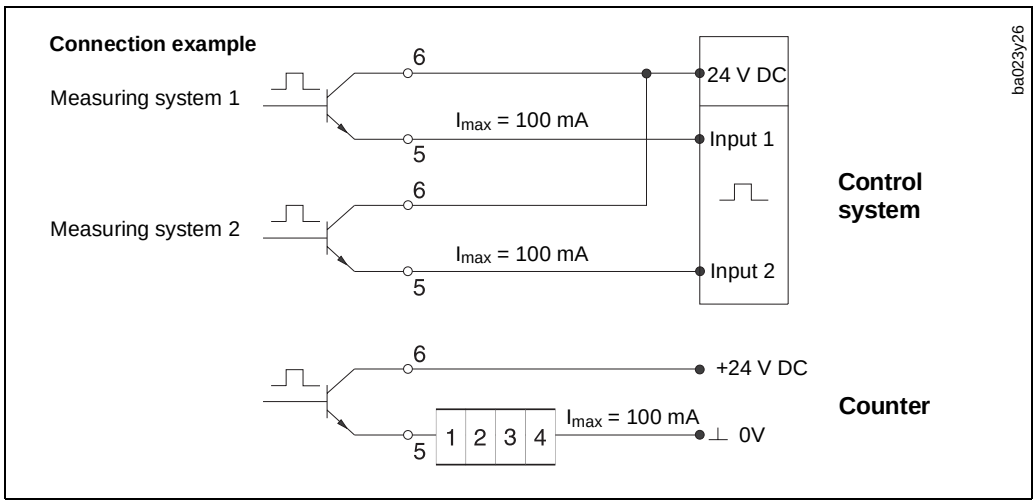


Fig. 10:
Connection example

2.7 Potential equalisation

Correct earthing of the sensor is important for accurate measurement. However, this is not critical when using metal piping under normal conditions.
Dosimag A is fitted with reference electrodes as standard. These produce a potential equalisation between the sensor and fluid.

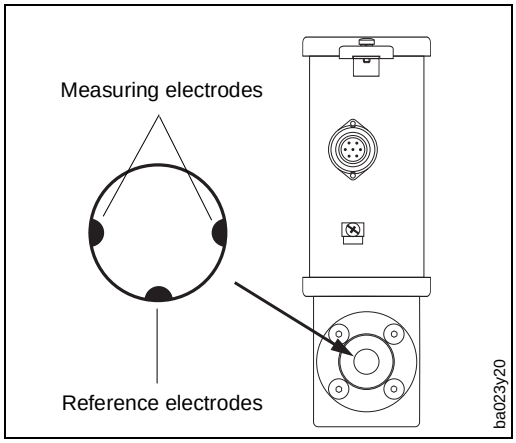


Fig. 11:
Position of electrodes

Position of electrodes
With horizontal mounting the reference electrodes must always be at the bottom.

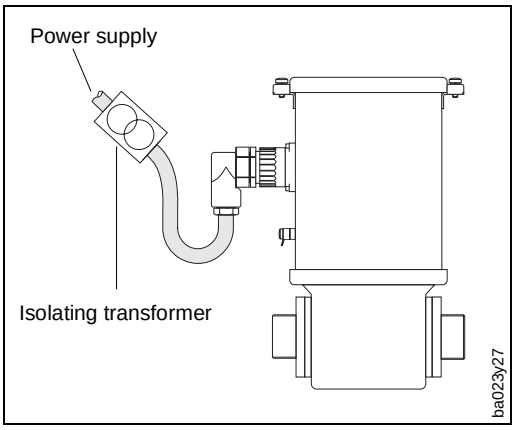


Fig. 12:
Use of an isolating transformer

Potential-free installation

Caution!
Measurement of highly conductive fluids (e.g. acids, caustics) and the use of plastic or lined pipes or hose can cause electrode damage due to galvanic decomposition. In such cases the instrument must be installed potential-free. Observe all national regulations regarding potential-free installation (e.g. VDE 0100)

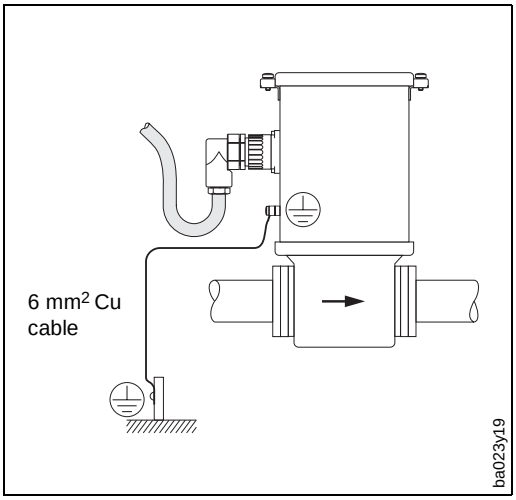


Fig. 13:
Grounding of Dosimag A

Electromagnetic compatibility
In order to fully guarantee the electromagnetic compatibility (EMC) of the Dosimag A, it is recommended that the instrument is connected to earth potential using the earth terminal at the housing.

3. Commissioning

3.1 Setting instrument functions

Instrument functions are set using miniature switches on the electronic circuit board.

Warning!
Switch off the supply voltage before unscrewing the cover to the electronic compartment.

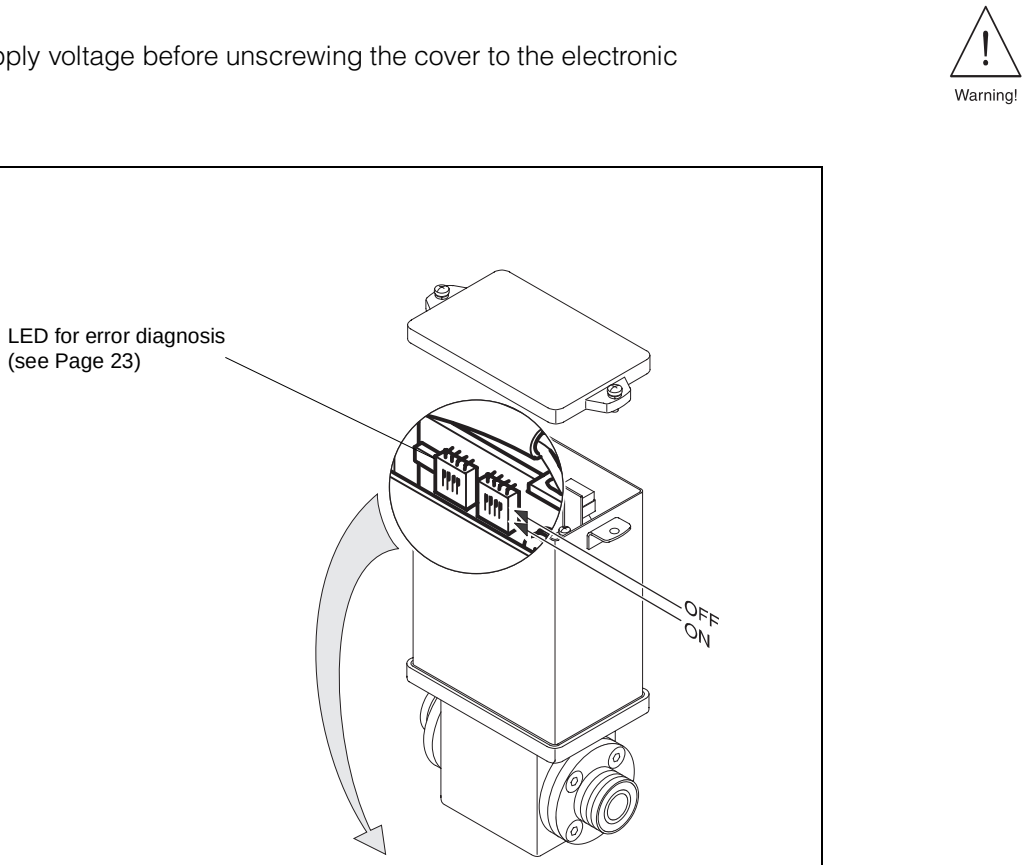


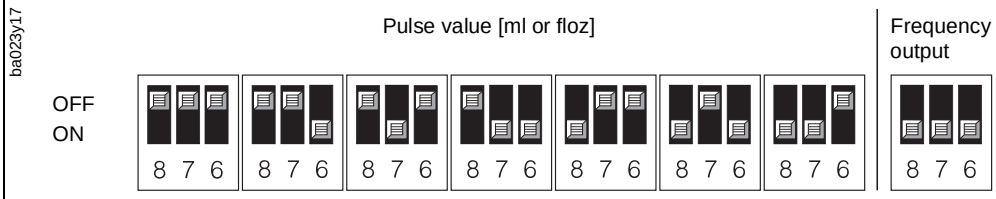
Fig. 14:
Setting the functions using miniature switches

Table: Pulse values and frequency output

Seven pre-programmed pulse values are available for each nominal diameter.
The frequency output is selected with the switch positions ON, ON, ON (f = 10 kHz at v = 10 m/s).

Note!

Note!
The pulse value should be selected so that the maximum frequency of 10 kHz is not exceeded during operation.



SI engineering units [ml/pulse]: Switch 1 OFF

Nominal diameter	ml/pulse	ml/pulse	ml/pulse	ml/pulse	ml/pulse	ml/pulse	ml/pulse	f =10 kHz at v=10 m/s
DN 2	0.001	0.002	0.005	0.01	0.02	0.05	0.1	f_{out} 10 kHz
DN 4	0.001	0.002	0.005	0.01	0.02	0.05	0.1	f_{out} 10 kHz
DN 8	0.01	0.02	0.05	0.1	0.2	0.5	1.0	f_{out} 10 kHz
DN 15	0.1	0.2	0.5	1	2	5	10.0	f_{out} 10 kHz
DN 25	0.1	0.2	0.5	1	2	5	10.0	f_{out} 10 kHz

US engineering units [floz/pulse]: Switch 1 ON

Nominal diameter	floz/pulse	floz/pulse	floz/pulse	floz/pulse	floz/pulse	floz/pulse	floz/pulse	f =10 kHz at v=10 m/s
DN 2	0.0001	0.0002	0.0005	0.001	0.002	0.005	0.01	f_{out} 10 kHz
DN 4	0.0001	0.0002	0.0005	0.001	0.002	0.005	0.01	f_{out} 10 kHz
DN 8	0.001	0.002	0.005	0.01	0.02	0.05	0.1	f_{out} 10 kHz
DN 15	0.01	0.02	0.05	0.1	0.2	0.5	1	f_{out} 10 kHz
DN 25	0.01	0.02	0.05	0.1	0.2	0.5	1	f_{out} 10 kHz

Fig. 15:
Pulse and frequency output

Calculating the pulse value

Example:
DN 8, maximum rate of flow Q = 125 ml/s, maximum output frequency f_{max} = 1000 Hz (1000 pulses/s)

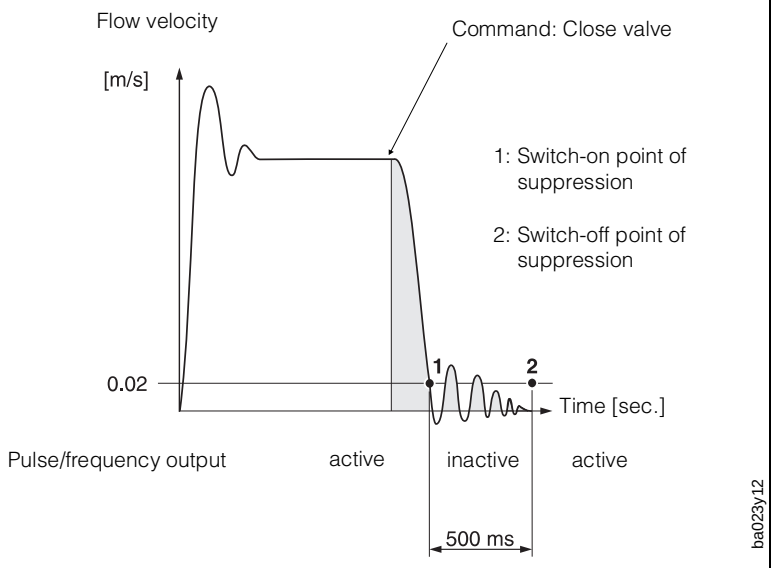
$$\text{Pulse value} = \frac{Q}{f_{max}} = \frac{125\ \text{ml/s}}{1000\ \text{Hz}} = 0.125\ \text{ml/pulse}$$

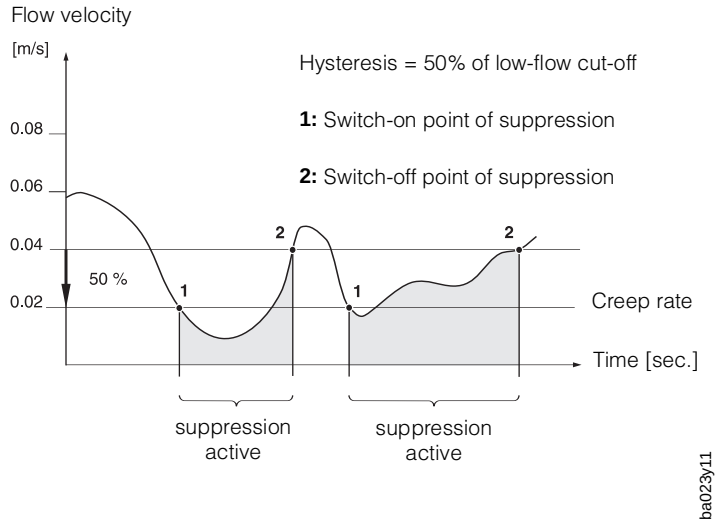
For DN 8, select the next higher pulse value = 0.2 ml/pulse ⇒

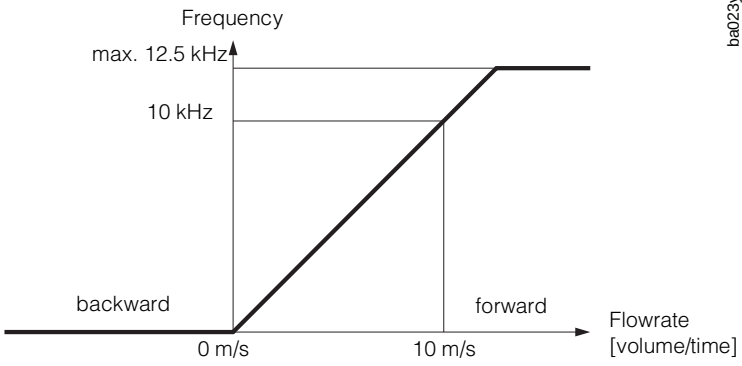
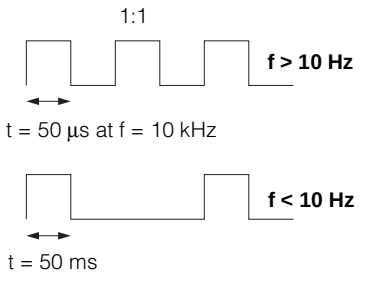
giving the maximum expected frequency

$$f_{max} = \frac{Q}{\text{Pulse value}} = \frac{125\ \text{ml/s}}{0.2\ \text{ml/pulse}} = 625\ \text{Hz}$$

3.2 Instrument functions and factory settings

System units	SI units: Volume in ml US units: Volume in floz (fluid ounces) (1 floz = 29.574 ml) Factory setting: **SI units** Switch No. 1: **OFF**
Noise suppression	The sensitivity of the output signal to transient flows and interference peaks can be reduced by using a digital filter function. Factory setting: **Switched off** Switch No. 2: **OFF**
Pressure pulse suppression	When batching valves are closed, strong, short duration liquid movements can occur in the piping and be detected by the sensor. Counting of such pulses leads to an incorrect totalizer value. For this reason, Dosimag A is equipped with pressure pulse suppression, permitting suppression of these system dependent interferences. *Switch-on point:* If the flowrate falls below a value of 0.02 m/s, then pressure pulse suppression is activated and the pulse/frequency output is inactivated for 500 ms (0 Hz), independent of the actual flowrate. *Switch-off point:* The pressure pulse suppression is deactivated after 500 ms. Factory setting: **Switched off** Switch No. 3: **OFF** 

Instrument functions and factory settings	
Sampling rate	The standard setting is 55 samples per second (= 55 SAPS). For accuracy optimization with dosing times of < approx. 1.5 s, a sample frequency of 83 can be selected. After setting to a higher sample frequency, it is recommended to recalibrate the system since minimal zero point shift can occur. This has no influence on the specified reproducibility. Factory setting: **55 SAPS** Switch No. 4: **OFF**
Creep suppression	Creep suppression prevents "false flow" from being detected (e.g. varying liquid head at standstill). *Switch-on point:* If the flowrate falls below a value of v = 0.02 m/s, then creep suppression is activated and the pulse/frequency output is deactivated. *Switch-off point:* If the flowrate rises above v = 0.04 m/s, then creep suppression is deactivated. Factory setting: **Switched on** Switch No. 5: **ON** 

Instrument functions and factory settings	
Pulse/ frequency output	The output can be used either as a pulse output or as a frequency output, depending on the position of the miniature switches. *Pulse output:* The pulse output is scaled within the range v = 0...10 m/s (max. 12.5 m/s), i.e. the user assigns a pulse weight to a particular volume (volume/pulse). These pulse are added by an external totaliser for determining total volumetric flowrate. *Frequency output:* The frequency output 0...10 kHz is permanently assigned a flowrate of 0...10 m/s. The measuring system measures unidirectionally, i.e. it will produce a signal for flow in a positive direction only. Signals for negative flow are suppressed. The results of measurement are linear up to a set full scale value (0...10 kHz). Spreading the pulse/frequency range is possible up to max. 12.5 kHz. Factory setting: **Frequency output** Switch No. 6, 7, 8: **ON - ON - ON** **Pulse/frequency output (passive)**  Note!  With frequencies above 10 Hz the on/off ratio is about 1:1. The pulse width in seconds is $t = {}^{0.5}/_{f\,(Hz)}$. At f = 10 kHz the pulse width is 50 µs. With frequencies below 10 Hz the on/off ratio is asymmetrical. The pulse width is constant at 50 ms. The behaviour of the pulse/frequency output is also dependent upon the status output configuration (see Page 20).

Instrument functions and factory settings			
Status output	Any error messages occur are given at the status output. The following error conditions are registered: Power supply error System error: Coil current error Amplifier error EEPROM error ROM error RAM error Process errors: Exceeding the measuring range (v >12.5 m/s) Max. frequency attained: Exceeding max. output frequency due to too low pulse scaling value (f >12.5 kHz and v <12.5 m/s) The status output has a fail-safe mode, i.e. with normal and error-free measuring range, the output is closed (Open Collector closed). **The status output cannot be affected by miniature switches.**		
	Status	**Behaviour of the status output** 	**Behaviour of the pulse/ frequency output**
	System OK.	closed 	f_{out} 0...12.5 kHz dependent on set pulse value and actual flowrate
	Power supply error	open 	f_{out} = 0 kHz
	System error	open 	f_{out} = 0 kHz
	Process error (v >12.5 m/s)	open 	f_{out} = 0 kHz
	Maximum frequency attained pulse value too small (f >12.5 kHz and v<12.5 m/s)	open 	f_{out} = 12.5 kHz Continuous output of 12.5 kHz even with overdriving the instrument

3.3 General information

Repeat the following checks before switching on the measuring equipment for the first time:

- Check the electrical connections and pin assignments.
- Check the maximum expected flowrate and corresponding frequency.
- Check the polarity of the connections.
- Does the direction of the arrow on the nameplate agree with the actual direction of flow in the piping?
- Is the measuring pipe completely filled?

If these checks are successful, then switch on the supply voltage. The unit is now ready for operation.
The outputs have the following status:

Pulse/frequency output	Status output	LED
f_{out} = 0...12.5 kHz	closed 	lights up

Note!
Ensure that, e.g. with a piston pump, all pressure peaks are detected.
For piston pumps the flow peaks are 3 to 4 times the mean delivery.


Note!

With extremely short peaks in the flow rate and/or batching times under 1.5 sec., the measuring accuracy reproducibility may be slightly below the specified error limits (depending on the process).

4. Troubleshooting and Remedies

4.1 Troubleshooting instructions


Note!

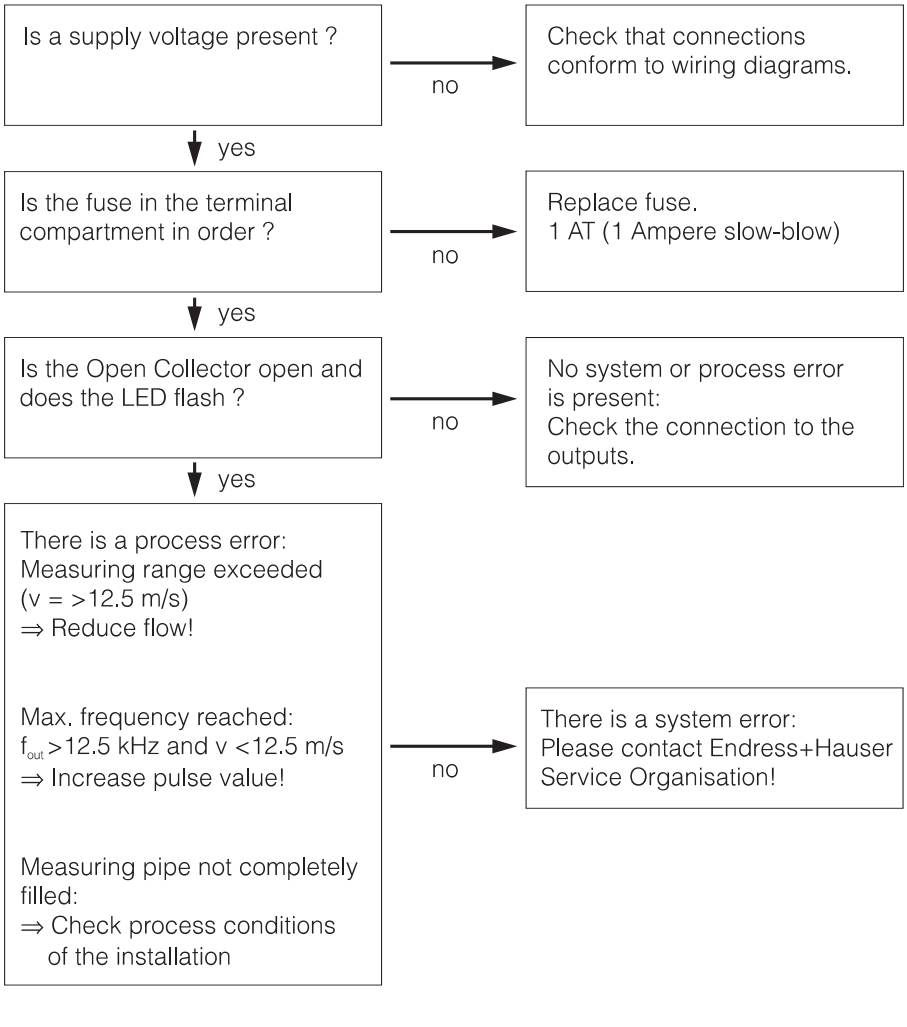
Note!
Error indications which occur during operation are given at the status output.

Type of error	Response of the status output	Response of the pulse/frequency output
Power supply error system error process error: (v >12.5 m/s)	Switch is open (Open Collector is open)	No output of pulses until the error has been cleared.
Maximum frequency attained, pulse value too small (f >12.5 kHz and v <12.5 m/s)	Switch is open (Open Collector is open)	Continuous output of pulses. Output at 12.5 kHz.

An LED is also situated on the amplifier board of the Dosimag A:

The LED remains lit to indicate operation without error. If an error is present, then this is shown by the LED flashing.

Flow diagram for correcting errors:



4.2 Replacing the instrument

Warning!
- Switch off the power supply before removing the Amphenol plug.

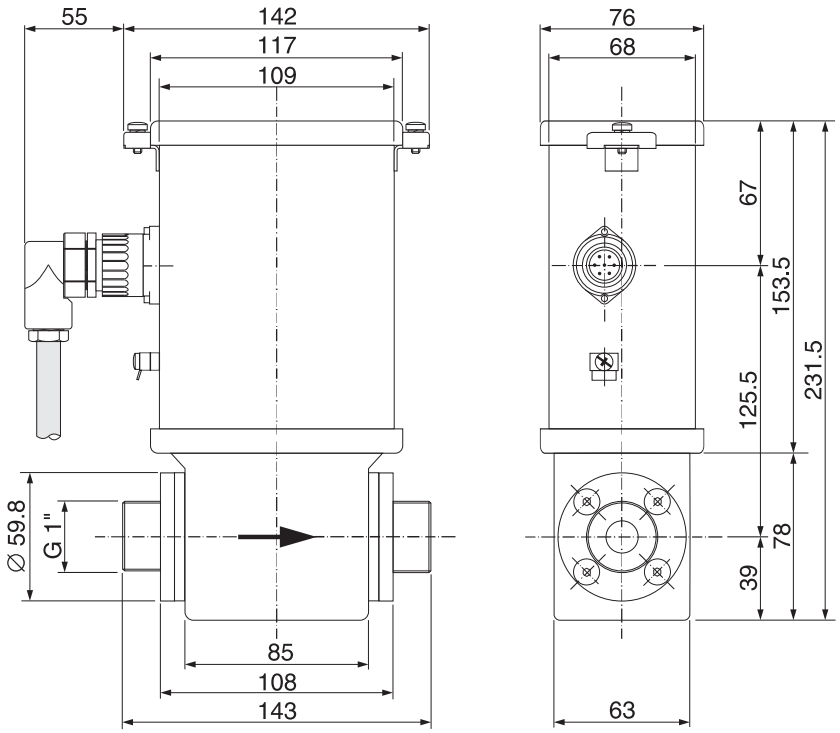
- Note that when replacing a standard version the system must normally be recalibrated to a new set amount.

- If returning a Dosimag A measuring system to Endress+Hauser for repair, please follow the safety instructions on Page 2.

5. Technical Data

5.1 Dimensions and weight

(All dimensions in mm)



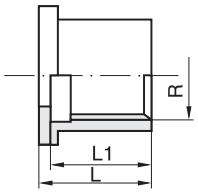
Weight: **3.5 kg**

Fig. 16: Dimensions

5.2 Sensor process connections

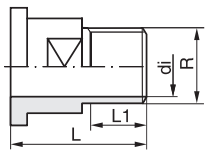
(All dimensions in mm)

Internal thread
(ISO 228/DIN 2999 thread standard)



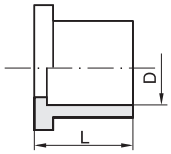
DN	L	L1	Thread
2...15	20	18	½"
2...15	20	18	NPT ½"
25	45	22	1"
25	45	22	NPT 1"

External thread
(ISO 228/DIN 2999 thread standard)



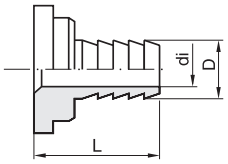
DN	L	L1	di	Thread
2...15	35	13.2	16.1	½"
2...15	42	20	16.1	NPT ½"
25	50	16.8	22	1"
25	60	25	22	NPT 1"

PVC adhesive coupling



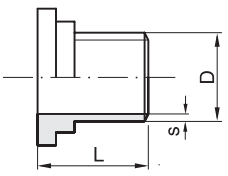
DN	L	D	Pipe connection
2...15	19	20	20 · 2
2...15	20	21.5	½"
25	66	25	25 · 2
25	69	32	32 · 2.5
25	69	33.5	1"

Hose connection



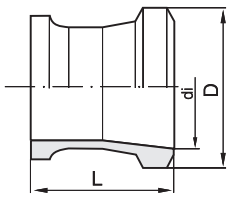
DN	L	D	di	LW
2...15	30	14.5	8.9	13
2...15	30	17.5	12.6	16
2...15	30	21.0	16.1	19

Weld stub
DN 2...15
(Dimensions for aseptic version are identical)



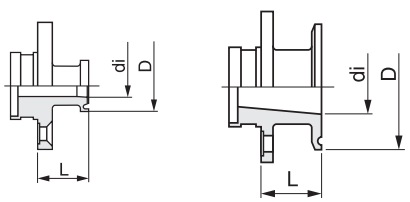
DN	L	D	s	Pipe connection
2...15	20	21.3	2.6	½"
2...15	20	21.3	2.6	18 · 1

Weld stub
DN 25
(Dimensions for aseptic version are identical)



DN	L	D	di	Pipe connection
25	30	33.7	26	1"
25	30	33.7	26	28 · 1
25	20	25.4	22.1	25.4 · 1.6 / 1"

Tri-Clamp®



DN	L	D	di	Pipe connection
2...8	24	25	9.5	½"
2...15	24	25	16	¾"
2...8	24	50.4	22.1	1"
15	24	50.4	22.1	1"
25	24	50.4	22.1	1"

Fig. 17:
Summary of process connections for the Dosimag A

5.3 Sensor technical data

Nominal diameter

DN [mm]	**DN** [inch]	**Pipe inner∅** [mm]
2	1/12"	2.2
4	5/32"	4.6
8	5/16"	8.6
15	1/2"	16.1
25	1"	22.0

Nominal pressure

- PVC threaded stubs PN 16
- 1.4435 (316L) threaded stubs (PN 16 for asceptic version with gasket) PN 40

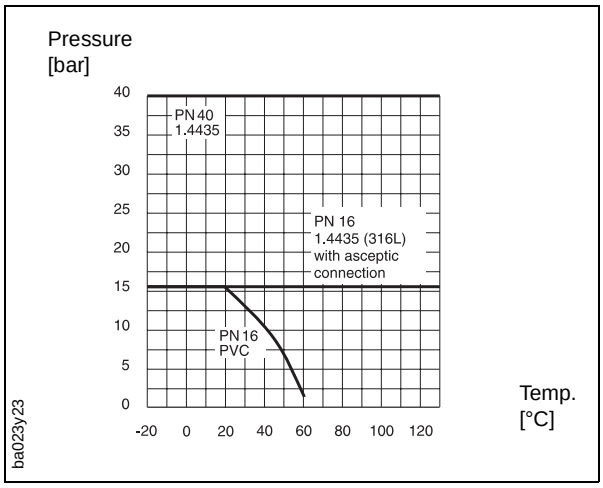


Fig. 18: Temperature/pressure diagram

Process connection (option)
external and internal thread 1.4435
PVC adhesive-coupling
hose connection 1.4435
weld stub 1.4435
aseptic weld stub for pipelines 1.4435 (according to DIN 11850)
Tri-Clamp® 1.4404/316L

Fluid temperature/liner material
-20...+130 °C / PFA

Vacuum resistance
0 bar abs

Housing material
1.4308 (investment casting), bare

Wetted parts
1.4435, bare

Electrodes fitted/material
Measuring and reference electrodes, 1.4435, Tantalum, Hastelloy C-22

Minimum conductivity
5 µS/cm

Gasket material

Viton	O-ring
Kalrez	O-ring
Silicone	Flat gasket (aseptic version)
Viton	Flat gasket (aseptic version)

CIP cleanability
yes (note max. temperature)

The following tables give an overview of the max. full-scale values at different flow velocities:

Nominal width mm	inch	0.5 m/s ml/s	1 m/s ml/s	2 m/s ml/s	3 m/s ml/s	5 m/s ml/s	10 m/s ml/s
DN 2	1/12"	1.571	3.142	6.283	9.425	15.708	31.416
DN 4	5/32"	6.283	12.566	25.133	37.699	62.832	125.664
DN 8	5/16"	25.133	50.266	100.531	150.797	251.328	502.656
DN 15	1/2"	88.358	176.715	353.430	530.145	883.575	1767.150
DN 25	1"	245.438	490.875	981.750	1472.625	2454.375	4908.750

Nominal width mm	inch	0.5 m/s l/min	1 m/s l/min	2 m/s l/min	3 m/s l/min	5 m/s l/min	10 m/s l/min
DN 2	1/12"	0.094	0.188	0.377	0.565	0.942	1.885
DN 4	5/32"	0.377	0.754	1.508	2.262	3.770	7.540
DN 8	5/16"	1.508	3.016	6.032	9.048	15.080	30.159
DN 15	1/2"	5.301	10.603	21.206	31.809	53.015	106.029
DN 25	1"	14.726	29.453	58.905	88.358	147.263	294.525

Fig. 19:
Table showing maximum flowrates

5.4 Transmitter technical data

Housing material	1.4301 electronic housing, bare 1.4308 cover (investment casting), bare
Protection type	IP 67/NEMA 4X
Ambient temperature	0 °C...+50 °C
Shock and vibration resistance	Acceleration up to 2 g/2 h per day 10...100 Hz
Cable entry	Amphenol plug IP 67 (IP 67 also guaranteed with unplugged connector)
Air connection (option)	G 1/8", instrument air max. 0.5 barg (IP 67 only with air purging and plugged in connector)
Power supply	20...30 V DC, reverse polarity protected
Power consumption	<12 W
Galvanic isolation	Input and outputs galvanically isolated from power supply, from sensor and from one another
Pulse/frequency output (Open Collector)	f_{max} = 12.5 kHz, U_{max} = 30 V DC, I_{max} = 100 mA, Galvanically isolated, pulse value adjustable, on/off ratio see Page 19.
Status output (Open Collector)	U_{max} = 30 V DC, I_{max} = 100 mA System and process error messages
Electromagnetic Compatibility (EMC)	As per CE EN 50081-1-2 and EN 50082-1-2

5.5 Error limits

Error limits	Standard version, typical ±5% o.r. Optional calibration ±0.5% o.r. ±0.01% o.f.s. (full-scale value = 10 m/s)
Reproducibility (Standard version and optional calibration)	td: batch time σ: standard deviation 1σ: ±0.4% with batch times 1.5 s <td <3 s 1σ: ±0.2% with batch times 3 s <td <5 s 1σ: ±0.1% with batch times 5 s <td

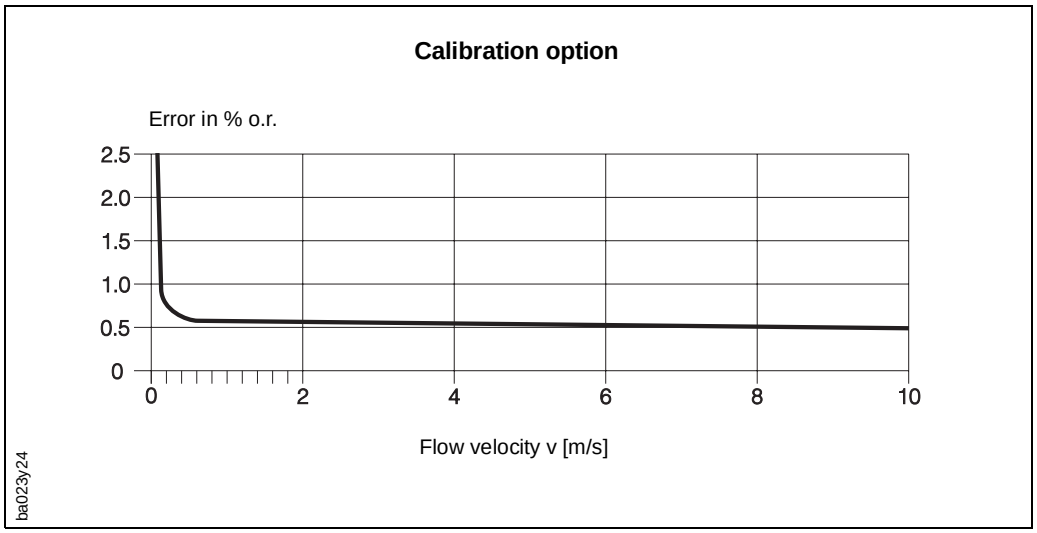


Fig. 20: Calibration option

Reference conditions (DIN 19200 and VDI/VDE 2641):

Fluid temperature	+28 °C ±2 °C
Ambient temperature	+22 °C ±2 °C
Fluid pressure	+2 bar ±0.2 bar
Inlet length	>10 · DN
Outlet length	>5 · DN

5.6 Product overview

Dosimag A electromagnetic flow measuring system

Sizes

T02 DN 2 PFA liner
End value: 0...1.89 l/min

T04 DN 4 PFA liner
End value: 0...7.54 l/min

T08 DN 8 PFA liner
End value: 0...30.2 l/min

T15 DN 15 or 1/2" PFA liner
End value: 0...106 l/min

T25 DN 25 or 1" PFA liner
End value: 0...295 l/min

Process connection/Material

A 1" thread, 1.4435 adapters/Viton gask.
B 1" thread, 1.4435 adapters/Kalrez gask.
C 1" thread, 1.4435 adapters/Silicone asep.
D 1" thread, PVC adapters/Viton gask.
E 1" thread, PVC adapters/Kalrez gask.
F 1" thread, 1.4435 adapt./Viton gask. asep.
G 1" thread, PVC adapt./Viton gask. asep.
H 1" TriClamp 1.4404/Silicone g. asep.
K 1" TriClamp 1.4404/Viton g. asep.
L ½" TriClamp 1.4404/Silicone g. asep. (only for DN 2...8)
M ½" TriClamp 1.4404/Viton g. asep. (only for DN 2...8)
N ¾" TriClamp 1.4404/Silicone g. asep. (only for DN 15)
P ¾" TriClamp 1.4404/Viton g. asep. (only for DN 15)
9 other

Electrodes/Material

1 1.4435/316L meas. and ref. electrodes (Prefered Type)
2 Hast-C22 meas. and ref. electrodes
3 Tantalum meas. and ref. electrodes
9 other

Electrical connection

A with Amphenol connector
B Instrument air G⅛" and Amph. conn. (IP 67 only with purging)
9 other

Calibration

1 Standard reproducibility (for filling applications)
2 3 point 0.5% calibration (for dosing applications)
9 others

Approvals

A Standard version
9 other

DDA ... -							⇐ Order code

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T

V

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