

PumpMeter LSA

Type Series Booklet



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Type Series Booklet PumpMeter LSA

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Monitoring Systems

Intelligent Pressure Sensors

PumpMeter LSA



General description

The PumpMeter device is designed for monitoring pump operation. It is an intelligent pressure transmitter for pumps, with on-site display of measured values and operating data.

It records the load profile of the pump in order to indicate any potential for optimising energy efficiency and availability. The device comprises two pressure sensors and a display unit.

PumpMeter is supplied completely assembled and parameterised for the pump it is used with. It is ready for operation as soon as the M12 plug connector is plugged in.

Main applications

- Food industry / beverage industry
- Pharmaceutical industry
- Chemical industry

Technical data

Technical data of the display unit

Characteristic	Value
Power supply	+24 V DC \pm 15 %
Current input	150 mA
Analog signal output	4 - 20 mA, 3-wire
Digital connection	RS485, Modbus RTU (Slave)
Enclosure	IP65 ¹⁾
Service interface	RS232
Storage temperature	-30 °C to +80 °C
Operating temperature	-10 °C to +60 °C

Technical data of the sensors

Characteristic	Value
Signal	4 - 20 mA
Enclosure	IP67 ²⁾
Fluid temperature	-30 °C to +125 °C
CIP & SIP	140 °C / 1 hour
Installation torque	20 Nm
Ambient temperature	-40 °C to +125 °C
Measuring range	-1 to 12 bar
Overpressure range	30 bar
Burst pressure	40 bar

¹ Provided that the connectors are connected correctly

² Provided that the connectors are connected correctly.

Materials

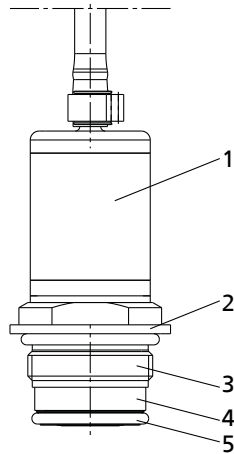


Fig. 1: Materials

1	Housing	2	Rear sealing element
3	Pipe union	4	Intermediate piece
5	Diaphragm		

Overview of materials

Wetted components	Material
Housing	1.4301
Pipe union	1.4571
Intermediate piece	1.4404
Diaphragm	1.4435
Rear sealing element	VMQ
Flush-mounted front sealing element	EPDM
Weld-in socket	1.4432

Product benefits

- Transparent pump operation by on-site display of all relevant operating data, e.g. the operating point of the pump
- Identifies potential energy savings by recording and analysing the load profile and displaying the energy efficiency icon (EFF) if applicable.
- Saves time and money as the sensors are fitted to the pump at the factory, unlike conventional instruments used in systems.
- Higher availability of the pump through detection and prevention of non-intended use

Functions

Pressure transmitter function

The discharge pressure or differential pressure of the pump are transmitted as a 4-20 mA signal. Connection via the RS485 serial interface with Modbus protocol is also possible.

Operating data display

The device alternately displays the suction pressure and discharge pressure as well as the differential pressure or head.

Recording and analysing of the load profile

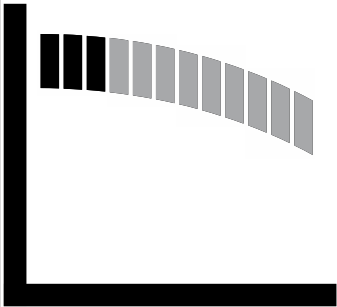
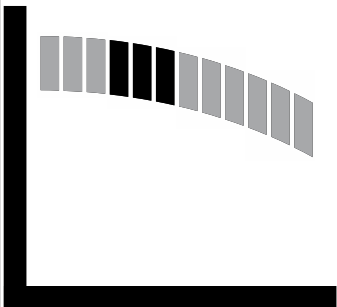
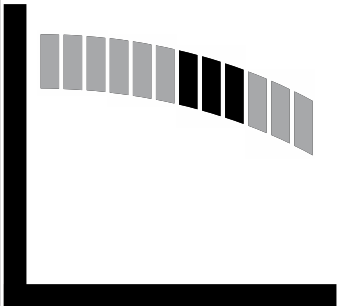
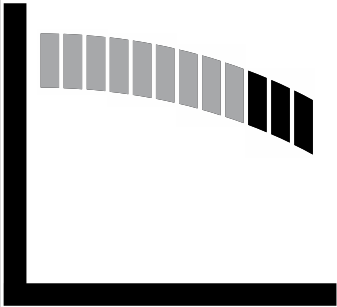


The operating hours of the pump in the different modes of operation are recorded in a load profile and saved in a non-volatile memory (protected against power failure). The energy efficiency symbol is displayed when a potential for optimisation is recognised.

Qualitative indication of the pump's current operating point

The flashing segment indicates the position of the current operating point on the generalised characteristic curve.

Qualitative indication of the pump's current operating point

Operating range	Segment display	Description
Operation in extreme part load conditions ³⁾ 	First quarter flashing (1)	<ul style="list-style-type: none"> Pump possibly not operated in accordance with its intended use Increased load on the components
Operation in moderate part load conditions ³⁾ 	Second quarter flashing (2)	<ul style="list-style-type: none"> Operation with potential for optimising energy efficiency
Operation near BEP 	Third quarter flashing (3)	<ul style="list-style-type: none"> Operation within intended operating range. Optimum energy efficiency
Operation in overload conditions 	Fourth quarter flashing (4)	<ul style="list-style-type: none"> Limit of the intended operating range Possibly overload of pump and/or motor

³⁾ For some pump characteristics, no differentiation is made between the part load operating conditions in the curve's first two quarters (both flashing simultaneously).

Electrical connections

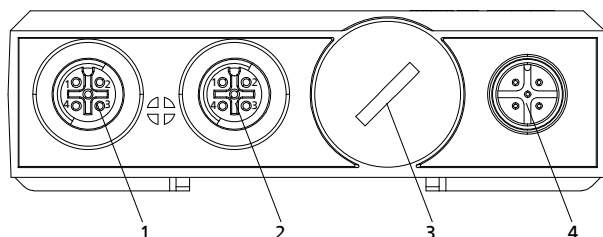


Fig. 2: Connections at the device

1	IN1 / port for the suction-side pressure sensor
2	IN2 / port for the discharge-side pressure sensor
3	Service interface
4	EXT / external port for energy supply and signal output

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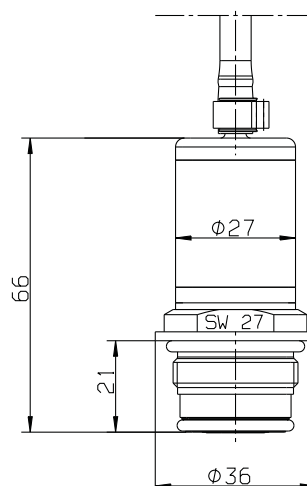


Fig. 3: Dimensions of the sensor

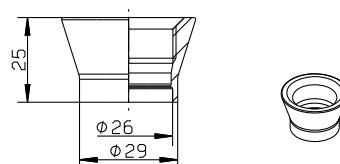


Fig. 4: Dimensions of the weld-in socket

Scope of supply

Depending on the model, the following items are included in the scope of supply:

- Display unit fitted
- Sensors fitted with adapter

Fluids handled

Fluids handled

Fluid handled	Concentration	Temperature
	[%]	[°C]
Alcohol (ethanol)	-	60
Alcohol (methanol)	-	60
Alcohol (propanol)	-	60
Aluminium sulphate	Up to 5 %	30
	Up to 10	30
Formic acid	10	20
Malic acid	Unsaturated solution	60
Apple purée	-	20
Apple juice	-	60
Cider	-	60
Benzoic acid	10	100
Beer	-	70
Beer hops	-	100
Beer mash	-	100
Beer trub	-	100
Beer wort	-	100
Spirits	10	60
Buttermilk	-	60
Calcium nitrate	10	30
Potassium acetate	Unsaturated solution	100
Fluids for CIP	-	90

Fluid handled	Concentration	Temperature
	[%]	[°C]
Coke	-	20
Coke concentrate	-	20
Deionised water (fully desalinated water)	-	-
Liqueur with egg yolks	-	50
Vinegar (wine vinegar)	-	60
Vinegar concentrate	25	25
Acetic acid	10	60
	50	20
	-	60
Fruit juices and fruit acids	-	60
Fruit liqueur	-	60
Vegetable juice	-	100
Tannic acid	Unsaturated solution	100
Glucose	Unsaturated aqueous solution	50
Glycerine	45	100
Glycol (ethylene glycol)	100	60
	50	60
Yeast	-	60
Sal volatile (ammonium carbonate) (ammonium bicarbonate)	Unsaturated solution	20
Evaporated milk	-	60
Evaporated milk, with sugar	-	60
Herbal liqueur	-	60
Lemonade	-	90
Lysol	-	60
Skim milk	-	40
Skim milk (sour)	-	40
Malt	-	100
Methyl alcohol	-	60
Milk	Fresh	40
Must	-	60
Sodium chloride (= common table salt)	2	20
Sodium hydroxide	Up to 20	80
	Up to 50	80
Fruit pulp	-	20
Oxalic acid	Unsaturated solution	20
Orange juice	-	-
Sap	-	50
High-purity water, ultra-pure water	-	100
Sparkling wine	-	50
Syrup	-	40
Water (fresh water) ⁴⁾	-	110
Wine (white and red wine)	-	60
Wine vinegar	See vinegar	-
Spirits of wine	See alcohol	-
Tartaric acid	Unsaturated solution	60
Water for injection	-	100
Wort; hot wort	-	100
Citric acid	Unsaturated solution	80
Sugar solution	< 20	100
	70	95

⁴ General assessment criteria for results of water analysis: pH ≥ 7; chloride content (Cl) ≤ 250 mg/kg. Chlorine (Cl₂) ≤ 0.6 mg/kg.

Spare parts

Spare parts

Description	Measuring range [bar]	Signal [mA]	Cable length [m]	[kg]	Mat. No.
Pressure gauge	1..12	4-20	1,2	0,4	01664291
Display unit	-	-	-		05092336

Accessories







Mechanical accessories

Overview of accessories

Description	Dimensions	Material	[kg]	Mat. No.
Intermediate piece with hygienic pipe union	DN 25×150	1.4404	1,5	01667079
Intermediate piece with hygienic pipe union	DN 32×166	1.4404	1,92	01667080
Intermediate piece with hygienic pipe union	DN 40×178	1.4404	2,4	01667081
Intermediate piece with hygienic pipe union	DN 50×202	1.4404	3	01659115
Intermediate piece with hygienic pipe union	DN 65×231	1.4404	3,9	01659637
Intermediate piece with hygienic pipe union	DN 80×262	1.4404	4,78	01659643
Intermediate piece with hygienic pipe union	DN 100×297	1.4404	5,96	01659644
Intermediate piece with hygienic pipe union	DN 125×453	1.4404	7,49	01659645
Weld-in socket	-	1.4404	0,2	01706600
Welding aid	M 28×1,5	1.4404	0,315	01706601

Electrical accessories

Overview of electrical accessories

	Description	Length	Mat. No.	[kg]
		[m]		
	Connection cable 5-pole cable with M12 connector for power supply and signal output	1	01146982	0,056
		5	01146983	0,118
		10	01146984	0,35
	Extension cord For extending the sensor cables	5	01146980	0,186
		10	01146981	0,33
	M12 bus cable, PumpMeter, pre-configured, shielded Colour: black; M12 socket, straight; M12 connector, angled	1	01533775	0,2
		2	01533776	0,2
		3	01533777	0,3
		5	01533778	0,3
	Power supply unit for the PumpMeter 24 V / 750 mA (for maximum 5 PumpMeter devices)	-	01147695	0,149
	Power supply unit for the PumpMeter 24 V / 330 mA with CEE plug (for 1 PumpMeter max.)	2	01494036	0,25
	RS232 parameterisation cable	-	47117698	0,2
-	Service dongle	-	47121256	0,1
-	USB/RS232 adapter	-	01111255	0,1



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