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High Precision Flow Transmitter

Alfa Laval Flow Transmitter



Application

The Alfa Laval Flow Transmitter is designed to fulfill the demands of hygienic and pharmaceutical production. Amongst others it is suitable for flow measurement in Food, Beverage, Dairy and Biopharm industries. The main features are:

- Constructed to be independent of variations in flow profile, the presence of solids and even changes in product viscosity.
- Suitable for Hygienic applications
- No internal pressure drop.
- Robust and compact design. Temperature tolerant up to 115°C. Easy to mount, even in difficult applications.
- Optimized for high accuracy and linearity.
- Pre set-up from factory, ready for installation.
- Bidirectional, (can measure in booth flow directions).
- No moving parts - no maintenance.

TECHNICAL DATA

Accuracy: . . . . . ±0.02 % of FS (testbench) <±0.2 % of FS (working conditions)
Repeatability accuracy: . . . . . Max 0.5* accuracy
Media conductivity: . . . . . Min 5 µS/cm

Resolution output signal

TE67A1XXXXXXXX: . . . . . 0.01 litre/pulse
TE67A2XXXXXXXX: . . . . . 0.01 litre/pulse
TE67A3XXXXXXXX: . . . . . 0.10 litre/pulse
TE67A4XXXXXXXX: . . . . . 0.10 litre/pulse
TE67A5XXXXXXXX: . . . . . 0.10 litre/pulse
TE67A6XXXXXXXX: . . . . . 0.10 litre/pulse

Protection class: IP67
Max media pressure: . . . . . 10 bar

Electrical data

Power supply: . . . . . 24 V AC/DC (0.25A)
Electrical connection: . . . . . Pg11 cable gland

Response time

Puls output: . . . . . 0.2 sec.
4-20 mA: . . . . . 1 sec.

Output

Puls output: . . . . . (0 to 1000Hz) , 4-20 mA (option), Profibus DP (option)

CE

PHYSICAL DATA

Materials

Wetted parts: . . . . . AISI 316 and PFA
Housing: . . . . . Noryl

Operating temperature

Wetted parts: . . . . . -30 to 115°C
Electronics range: . . . . . -10 to 50°C

Weight

Flow transmitter: . . . . . 5 kg. (type TE67A6: 10 kg.)

Measuring ranges

0 to 8 m^3/h (2113 GPH), ... (connection: DN25 (ISO2852))
0 to 20 m^3/h (5284 GPH), ... (connection: DN38 (ISO2852))
0 to 40 m^3/h (10568 GPH), . . . (connection: DN51 (ISO2852))
0 to 80 m^3/h (21136 GPH), . . . (connection: DN63 (ISO2852))
0 to 120 m^3/h (31704 GPH), . . (connection: DN76 (ISO2852))
0 to 200 m^3/h (52840 GPH), . . (connection: DN102 (ISO2852))

Process connections

TE67A1XXXXXXXX: connection: . . . . . clamp DN25 (ISO2852)
TE67A2XXXXXXXX: connection: . . . . . clamp DN38 (ISO2852)
TE67A3XXXXXXXX: connection: . . . . . clamp DN51 (ISO2852)
TE67A4XXXXXXXX: connection: . . . . . clamp DN63 (ISO2852)
TE67A5XXXXXXXX: connection: . . . . . clamp DN76 (ISO2852)
TE67A6XXXXXXXX: connection: . . . . . clamp DN102 (ISO2852)

Certificates
- Calibration certificate (option)
- 3.1 certificate (option)

Electrical data
The Alfa Laval Flow Transmitter is pre-setup from factory ready for installation and has as standard integrated automatic zero point adjustment. As an option The Alfa Laval Flow Transmitter can be delivered with display giving access to advanced features such as integrated temperature compensation through external pt100 sensor, PI regulator and for low flows a linearization function further optimizing the accuracy at low flows.

Standard range
The Alfa Laval Flow Transmitter is an electromagnetic precision meter for volumetric measurement of liquids that are electrically conductive. The transmitter can be used in applications where a hygienic design is required and the rugged construction of the transmitter makes it suitable for installations where solid particles are present in the liquid.

The standard version is delivered pre-setup making installation quick and easy. The output signal is as standard a pulse-signal (0 to 1000 Hz) with a resolution of either 0.01 or 0.1 ltr/pulse. As an option the Flow Transmitter can be delivered with analogue 4-20 mA output or profibus DP. A display can be attached enabling advanced features, such as scaling and changing of resolution.

The metering tube is coated with PFA on the inside and is fitted with clamp connections. The sensitive electronic is completely embedded and consequently hermetically sealed. The flow transmitter is water proof with protection class IP 67. The terminals for electrical connection are marked with both number and function and cable access is done through 3 PG-11 cable glands.

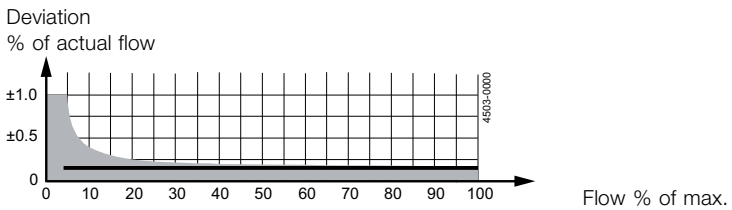
Working principle
The Alfa Laval FlowTransmitter consists of a metering pipe and two magnetic coils. When a current is applied to the coils a magnetic field is produced at right angles to the metering pipe.

With a conductive liquid flowing through the metering pipe an electrical voltage is induced and measured by two electrodes mounted in the metering pipe. This voltage is proportional to the average velocity of flow and therefore to the volume flowing.

The Alfa Laval Flow Transmitter utilizes a square measurement chamber. The shape of the measurement chamber significantly reduces the influence of viscosity, type of liquid, and flow profiles and eliminates any need for recalibration when changing product for instance from milk to water.

The microprocessor in the transmitter controls the current generator keeping the magnetic field constant. The voltage across the electrodes is amplified and converted to a digital value from which the microprocessor calculates the liquid flow.

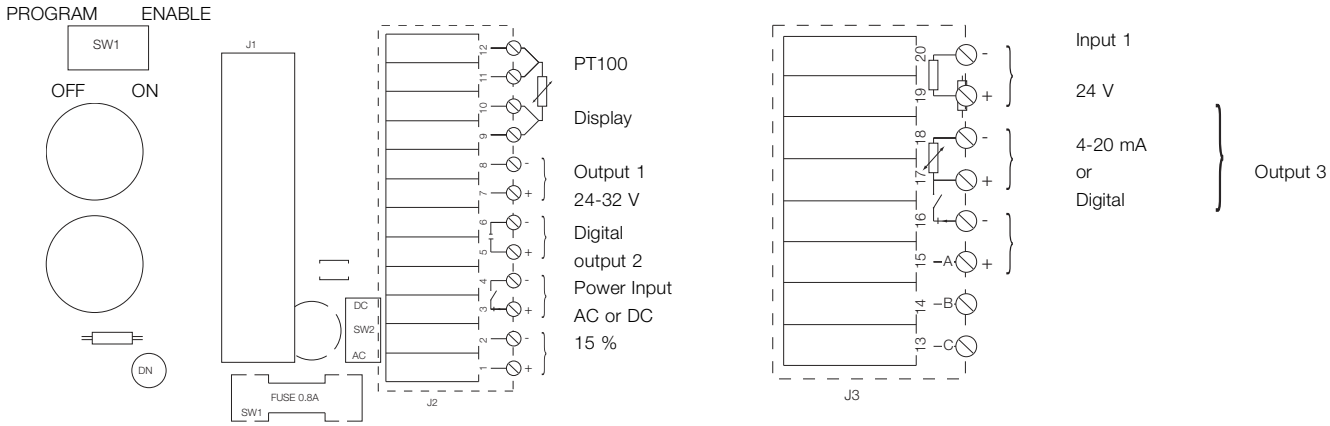
Accuracy graph



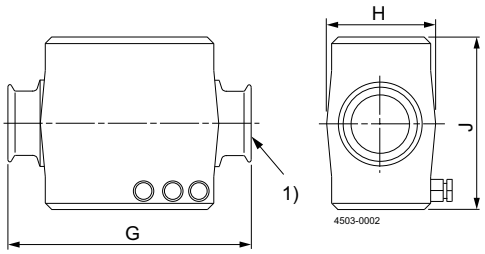
Max. error vs. actual flow rate
Flow velocity: 100% of max. equals 5.4 (m/s)

Expected performance with linearizing function enabled (typical data at reference test conditions).
Real life performance including the effects of variations in liquid type/temperature, ambient temperature and power supply voltage.

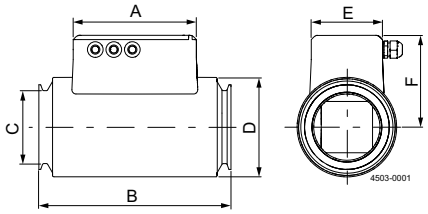
Electrical layout diagram of connection box (TE67Axxxxx1xxx and TE67Axxxxx2xxx)



Dimensions (mm)

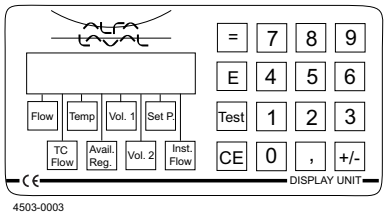


Dimensional drawing of Alfa Laval Flow Transmitter
TE67A1XXXXXXXX to TE67A5XXXXXXXX



Dimensional drawing of Alfa Laval Flow Transmitter
TE67A6XXXXXXXX

A	B	C	D	E	F	G	H	J
175	270	102	140	105	130	250	110	178



Display for Flow Transmiter
TE67X000000284

Selections guide

When selecting a Flow Transmitter the two following rules should be followed:

1. The Flow Transmitter with a pipe dimension equal to the rest of the piping system should be selected.
2. If optimum measurement accuracy is of primary concern, the smallest possible transmitter should be chosen, while still observing that the maximum flow rate must never be exceeded.

The below table can assist in selection.

Selection example

Problem: The flow to be measured is between 4 and 12 m³/h and the piping installation is 38 mm (1”). Solution: according to the selection guide model TE67A2xxxxxxxx and TE67A3xxxxxxxx can be used, both selections will give optimum accuracy. But following rule number TE67A2xxxxxxxx is selected as it has the same piping diameter as the installation and thereby minimizes pressure loss in the system.

