



# Electronic volume flow sensors

**FTS 2-32DL FTS4-50DL FTS5-85DL FTS 9-150DL**



FTS...DL electronic volume flow sensors have a measurement principle based on Karman vortex streets. The generation of eddies from an obstructing body projecting into the flow is strictly proportional to the flow velocity. The generated eddies are detected by a piezoelectric paddle and evaluated by the integrated electronics. A microprocessor converts the analogue measurement values into a serial digital signal suitable for the DL bus (data link).

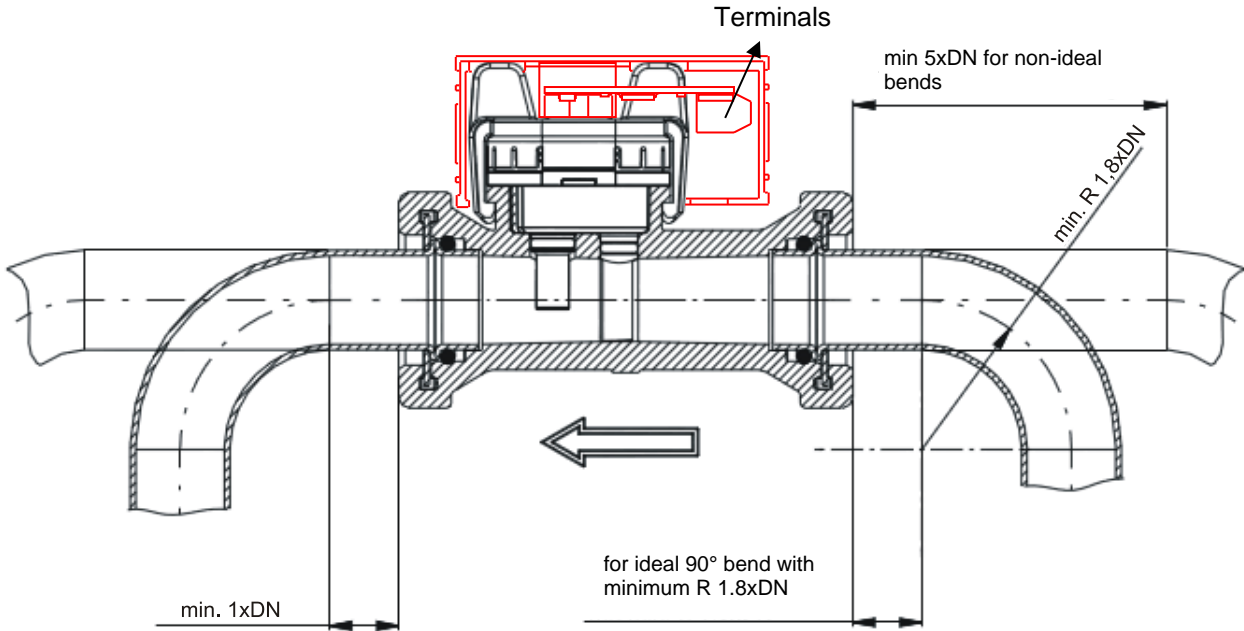
## The sensor has the following features:

- Measurement of flow rates between 2 and 150 litres per minute
- Measurement of media temperatures from -40 to 125°C using a PT1000 sensor
- Measurement output via the DL bus
- Measurement of a second temperature (PT1000)
- Connection option for a pressure sensor PRS0-6 (0 - 6 bar)
- The flow channel contains no moving parts
- Adapter PCB for easy connection to commercial cable cross sections
- Freely selectable fitting position
- Measurement principle insensitive to contamination and medium properties
- Drinking water approvals: KTW and DVGW process sheet W270, WRAS
- Not suitable for freshwater stations as the DL bus transmits the signals too slowly to the controller

## Installation:

The following instruction must be observed for correct functioning of the sensor:

- ◆ The pipe internal diameter must never be smaller than the internal diameter of the measurement pipe (DN ...).
- ◆ Numerous bends or elbows which are not in the same plane must be avoided directly upstream of the inlet (generation of swirl).

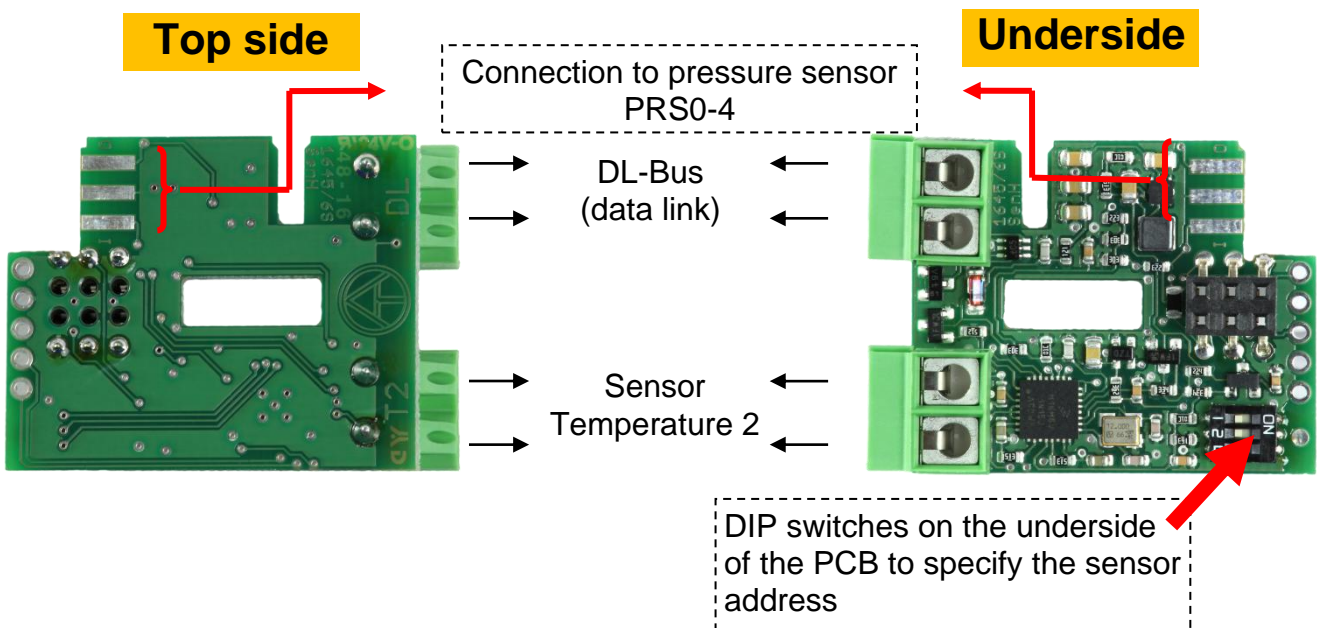


**The flow direction must be observed without fail** (indicated on the sensor by an arrow).

The fitting position can be freely selected.

Pulling out of the retaining clips allows the brass couplings to be pulled out. When the couplings are reinserted in the sensor part, it is recommended that the sealing rings are lubricated with a little soap to improve sliding.

## Electrical connection:



The polarity of the connections ("earth") is interchangeable, hence is unimportant.

The adapter shown takes its power supply from the DL bus (data link) and returns the corresponding measurement when requested by the controller (**ESR21**, **UVR61-3** and **UVR63H** from version 5.0, **ESR31**, **UVR63**, **UVR1611** from version A3.00 and serial number 13286, plus controllers that have X2 technology e.g. **UVR16x2**). The input "Temperature 2" on the adapter PCB permits measurement of an additional external temperature. This is only possible for sensors of type PT1000.

The request is made up of the **address** of the sensor (adapter PCB) and **index** of a measurement recorded there.

The **address** is set using the DIP switches. These are located on the underside on the PCB. In the delivered condition, the address is set to 1 (factory setting). Provided no other sensors are connected to the DL-bus, no change of address is required.

The effective address is derived from address 1 (= factory setting) plus the sum of all the values of the selected DIP switch settings.

**Example:** Required address 6 = 1 (from factory setting) + 1 + 4  
= DIP switches 1 and 4 must be set to **ON**.

The **index** of the respective measurements is fixed:

<b>Index:</b>	<b>Measurement:</b>	<b>Sensor type</b>
1	Volume flow [1l/h]	FTS 4-50 DL (DN 15)
2	Temperature [0.1°C]	FTS .... DL
3	Temperature 2 [0.1°C]	PT1000
4	Pressure [0.01 bar]	FTS .... DL + pressure sensor PRS0-6
5	Pressure [0.01 bar]	FTS .... DL + pressure sensor PRS0-4
6	Volume flow [1l/h]	FTS 2-32 DL (DN 10)
7	Volume flow [1l/h]	FTS 5-85 DL (DN 20)
8	Volume flow [1l/h]	FTS 9-150 DL (DN25)

**ESR21, ESR31, UVR61-3, UVR63, UVR63H:** The desired measured values are imported as "External sensors" (setting in the menu "**EXT DL**"), where address and index are specified.

**Example:**



Here the external sensor **E3** has been allocated the sensor value of **address 1** with **index 3**, that is the value of a temperature sensor PT1000, which is connected to the FTS sensor.

**Controllers that have X2 technology:** The measured values are parameterised in the menu "**DL bus**".

**UVR1611:** The measurements are parameterised as **analog** network inputs:

**NW.Node :** Sensor address (above example: 1)  
**Anal.NW.Outp. :** Measurement value index (above example: 3)  
**Source :** DL

Technical data	Measurement range	Overall length	Connection thread	Pipe diameter
FTS 2-32 DL	2 ... 32 l/min	118 mm	G 1/2"	DN 10
FTS 4-50 DL	4 ... 50 l/min	130 mm	G 3/4"	DN 15
FTS 5-85 DL	5 ... 85 l/min	151 mm	G 3/4"	DN 20
FTS 9-150 DL	9 ... 150 l/min	120 mm	G 1 1/4"	DN 25

Technical data		FTS 2-32DL	FTS 4-50DL	FTS 5-85DL	FTS 9-150DL
Flow	Accuracy for <50%FS	< 1% FS (FS = full scale)			
	Accuracy for >50%FS	< 2% of the measurement value			
Temperature	Measurement range	-40 ... +125 °C			
	Accuracy	± 0.3 K ± 0,005*T			
Bus load (DL-Bus)	Without pressure sensor	25%			
	With pressure sensor	30%			
Operating temperature range		-40°C ... +125°C briefly +140°C <b>Note:</b> With low medium temperatures, condensation must be prevented from forming on the sensor PCB.			
Pressure loss		according to characteristic curve			
Burst pressure		>18 bar at +40°C			
Housing material		Grivory 40% GF			
Drinking water approval		KTW / W270, WRAS			

## Pressure loss

characteristic curve:

FTS 4-50 (DN15)

FTS 9-150 (DN25)

