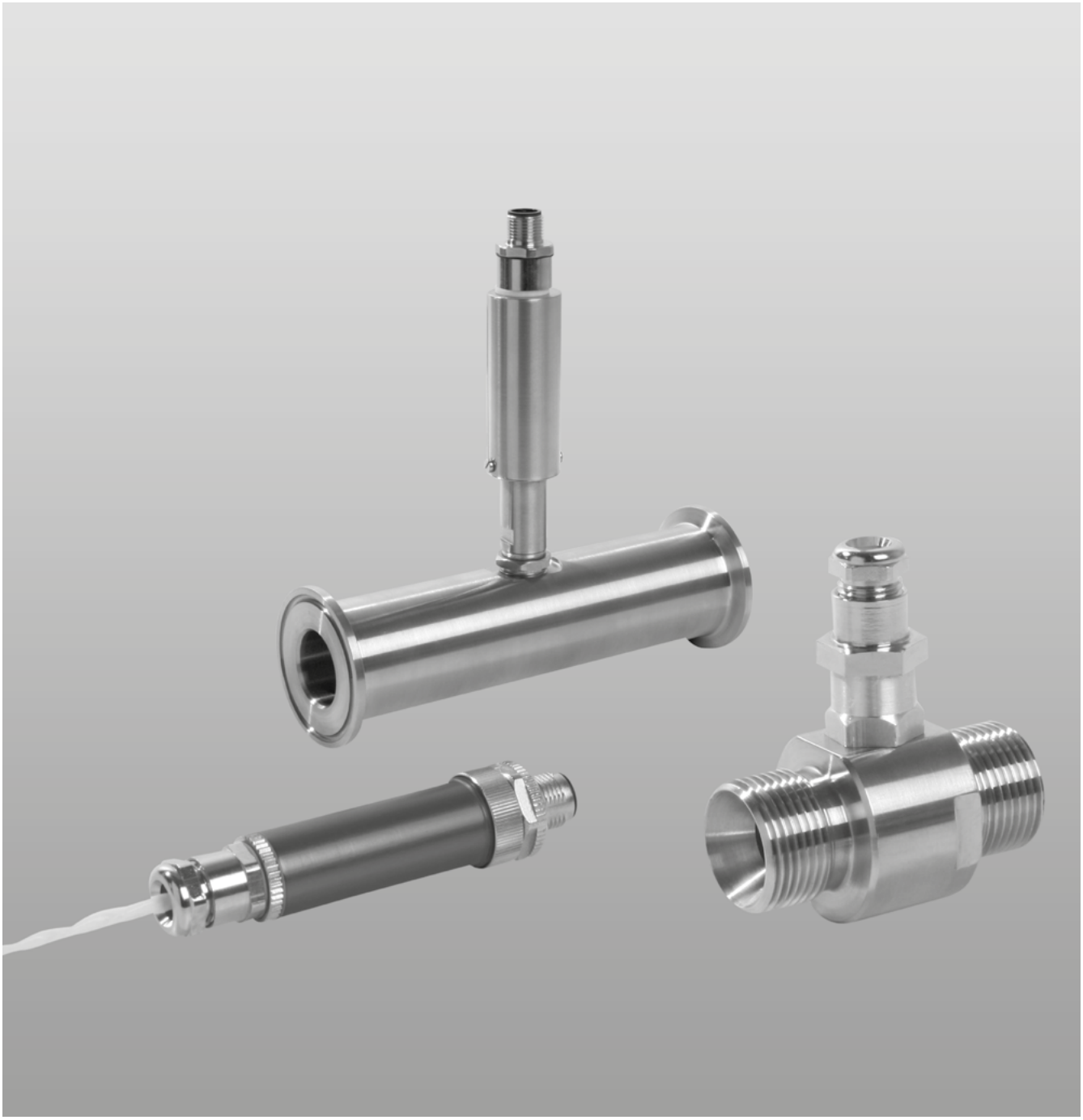
fluid
technology
solutions

VSE flow®

Operating instructions

for turbine flow meters of the series: “VTR”



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1. IMPORTANT INFORMATION AND LEGAL NOTICES

Dear customer, dear user,

This operating instruction for turbine flow meters of the **"VTR"** series by VSE Volumentechnik GmbH (VSE) contains information required to properly install and commission the turbine flow sensor for the intended purpose.

Any installation, commissioning, operation, maintenance and testing may only be carried out by trained and authorized personnel. The operating instructions must be read and followed carefully to ensure a trouble-free, proper and safe operation of the turbine. In particular, the safety instructions are essential.

These operating instructions must be kept safe and accessible for the authorized personnel at all times. At no time should contents of the operating instructions be removed. A missing manual or missing pages must be replaced immediately if lost. The operating instructions can be requested at any time from VSE or downloaded from our website www.vse-flow.com. The operating instructions must be passed on to each subsequent user of the turbine.

This operating instruction is not subject to any modification service by VSE. VSE reserves the right to make technical changes at any time without notice.

VSE makes no warranties, express or implied, with respect to commercial qualities and suitability for a particular purpose.

VSE accepts no liability for damage and malfunctions resulting from operating errors, failure to observe these operating instructions, improper installation, commissioning or maintenance as well as improper use of the turbine.

The opening of the turbine is absolutely not permitted. After an unauthorized opening or rebuilding as well as after a single, incorrect connection of the turbine's circuits, the warranty as well as the product liability by VSE will be void.

2. DESCRIPTION OF FUNCTION

The VTR turbine flow meter consists of the measuring turbine and the externally attached measuring pick-up.

The measuring liquid flows into the turbine and starts the rotor moving. The characteristic inside diameter means that the rotary speed is directly proportional to the flow. The moving rotor blades are detected by the pick-up and converted to a pulse signal.

The pulse output signal is fed to an electronic measuring system which displays either the volume flow or a total of the measured volume.

The characteristic quantity, the K-factor (pulses/litre) separately calibrated for every measuring instrument, is specified on the type plate.

3. MECHANICAL INSTALLATION

The VTR flow meters are designed for high accuracy and long-term stability. To ensure the same accuracy in practice, the following items must be considered when installing the turbine:

3.1 FLUSHING THE PIPE

If the turbine is to be installed in a new pipe system, the pipes must be flushed before installing the turbine to remove slag (deposits), welding beads, sand or other residues. Otherwise the turbine could be damaged.

3.2 FLOW STABILISATION

If possible, a straight section of pipe should be installed before the turbine. The length of the section should be 10 times the nominal value and the diameter must be the same as the turbine. If the turbine is installed immediately behind a pump, the length of the infeed section should be twenty times the pipe diameter. The turbine should also not be installed immediately after an elbow in the pipe. If there is an elbow, the inside radius should be twice the inside diameter of the turbine. If it is not possible to installed the specified infeed sections, the installation of a stabilising section, e.g. with a cruciform cross-section, is recommended.

3.3 REDUCTION OF THE PIPE CROSS-SECTION

Conical pipe sections with a maximum angle of 20°should be used to reduce the pipe diameter.

3.4 INSTALLATION UNDER A TANK

If the diameter is installed at the bottom of a tank, a stabilising section with a cruciform cross-section (baffle plate) should be installed between the tank and turbine to prevent vortices in the turbine system.

3.5 AIR INCLUSIONS

An air separator may be recommended to prevent falsification of the accuracy by air inclusions in the medium.

3.6 FILTERS

A screen filter should installed in the pipe to prevent damage to the diameter by solids or fibrous substances in the medium where contaminated liquids are involved. A fine filter is not required.

3.7 SYSTEM PRESSURE

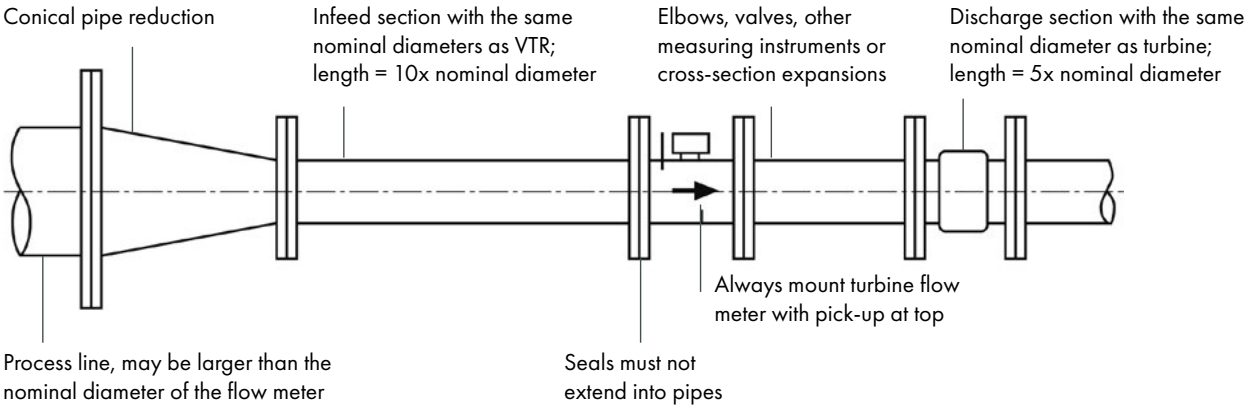
The operating pressure behind the turbine sensor must be sufficient to prevent the medium from gassing out at elevated temperatures. The system pressure should be 2 bar above the corresponding vapour pressure.

3.8 INFLUENCE OF VISCOSITY

VTR turbine flow meters are designed for measuring fluids similar to water. They are calibrated with water (viscosity 1 cSt). Fluids with a higher viscosity up to 5 cSt can be measured, but the following must be noted:

- The measurement range is reduced
- Linearity errors increase
- The output frequency is reduced

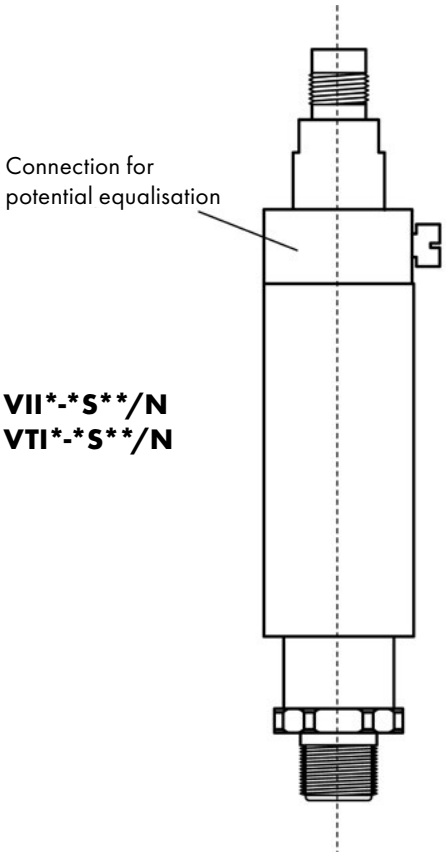
For exact information please contact VSE.



4. TECHNICAL DATA FOR VII*-*S**/N, VTI*-*S**/N SINGLE PICK-UPS

Supply voltage	U_b = 8 ... 30 V DC ±10%
Current consumption (idle)	I_b = ca. 4 mA (bei 30 V DC)
Signal output circuit	Transistor with series resistor R = 2 x 620 Ω PNP and NPN selectable
PNP signal output	High Signal: $U_S = U_b$ -1 V; I_S = 10 mA max.
NPN signal output	Low Signal: U_S = 0 V; I_S = 10 mA max.
Signal switching frequency	3 Hz – approx. 1000 Hz (*)
Electrical connection	VSE standard connector M 12
Medium temperature	-20°C ... +120°C (-4°F ... 248°F)
Ambient temperature	-20°C ... +60°C (-4°F ... 140°F)
Material	Stainless steel 1.4305
Weight	115 g

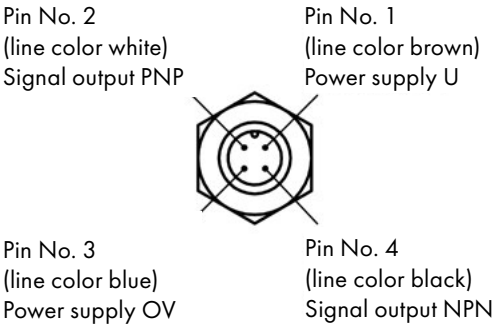
(*) Depends on the VHM flow meter size



VII*-*S/N**
VTI*-*S/N**

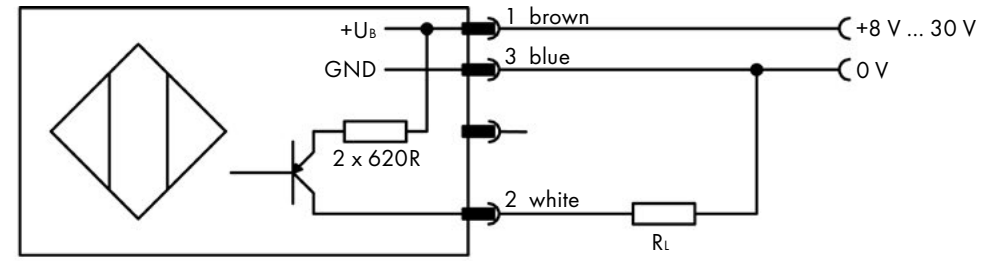
Dimensions

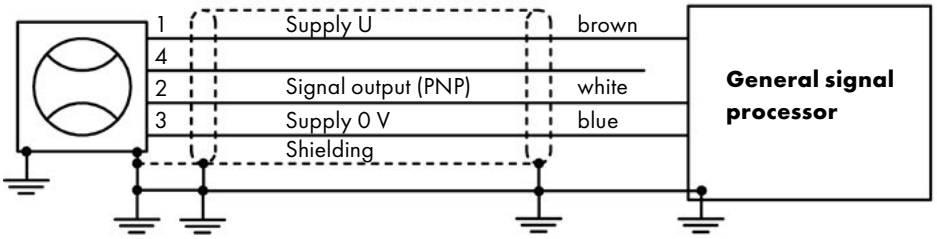
Ø= 25 mm; lenght= 119 mm



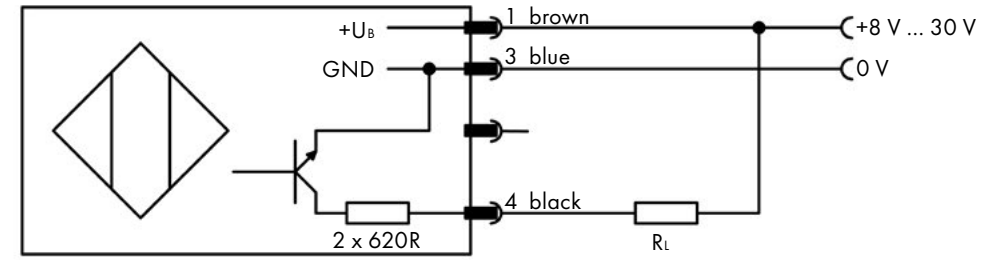
Pin configuration

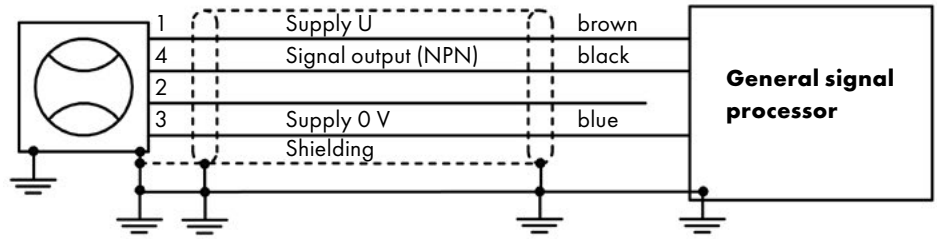
ELECTRONIC CONNECTION DATA FOR VII*-*S/N, VTI*-*S**/N SINGLE PICK-UPS**





Output signal PNP-switching





Signal output NPN-switching

5. MAINTENANCE, SERVICE LIFE AND WARRANTY

Depending on the operating conditions, the service life and specific properties of the flow meter are limited by wear, corrosion, deposits, or ageing. The operator is responsible for regular inspection, maintenance, and recalibration. In case of detected malfunctions or damage, operation must be immediately stopped. On request, we can provide a replacement flow meter for the duration of the repair. We recommend an annual inspection and recalibration. Under normal operating conditions, the service life is approximately 10,000 hours. The warranty period is 12 months.

6. STORAGE, RETURN AND DISPOSAL

Temporary storage

All VSE flow meters are delivered with sealing plugs and in suitable packaging for all destinations and transport types, ensuring optimal protection. The flow meters should always be stored in their original foam packaging or transport boxes. The flow meters must not be exposed to temperatures below -20°C or above +40°C and must be protected from direct sunlight and moisture or its effects. The maximum storage period is 48 months. If the maximum storage time is exceeded, the flow meter must be disassembled by the manufacturer VSE or an authorised service partner. This includes cleaning, replacing the seals, and recalibration.

Return

1. The flow meter must be properly cleaned before being returned to prevent the risk of poisoning/contamination of humans and the environment from harmful, explosive, or otherwise hazardous media.
2. If media have been measured whose residues can cause corrosion or ignite on contact with oxygen, the flow meter must be additionally neutralised and thoroughly dried with anhydrous, inert gas.
3. The return of the flow meter must always include a fully completed declaration of non-objection (see page 8). All applied safety and decontamination measures must be specified.
4. When returning the flow meter, it must be packed according to applicable logistics standards and sealed with sealing plugs.

Disposal

VSE actively promotes environmental protection and is certified according to ISO 9001:2015 (Environmental Management). The environmental and human impact should be minimised during production, storage, transport, use and disposal of our products and solutions:

- Collect rinsing liquid as well as residual fluids and dispose them according to statutory provisions and regulations.
- Wear protective clothing and a protective mask/goggle if necessary.

Materials must be properly disposed of as follows:

- Metal
- Plastics
- Electronic components
- etc.

Disposal must comply with the waste-related regulations and requirements of the respective destination country!

Declaration of non-objection
(Decontamination declaration for return deliveries)

Last Revision: 03/2025

In order to ensure occupational health and safety and to protect our employees from harmful effects when handling hazardous substances, this decontamination declaration must be fully completed and enclosed with all VSE flow meters which are returned.

The declaration is binding and may only be completed and signed by authorised personnel. It must be visibly attached on the outside of the return packaging and sent in advance by email, including all safety data sheets. VSE and its sales partners will only conduct an inspection and failure analysis of the returned VSE flow meters if a fully completed and signed declaration is provided. Otherwise, we explicitly reserve the right to reject the shipment.

It is mandatory to obtain written approval before returning any VSE flow meters.

Approval was granted on _____ **by (contact person)** _____

Type _____

Serial number _____ **Quantity** _____

Reason for return _____

1. **The VSE flow meter was last used with the following operating medium: (Safety data sheet must be enclosed.)** _____

Application-related contamination and effects:

 **irritant**	◯	 **harmful to health**	◯	 **radioactive substances[1]**	◯
 **toxic**	◯	 **corrosive**	◯	 **biologically hazardous substances[1]**	◯
 **hazardous to the environment**	◯	 **flammable**	◯		
 **oxidising**	◯	 **explosive**	◯		

[1] The return of VSE flow meters that have been contaminated by radioactive or biologically hazardous substances is expressly excluded.

2. ◯ **The VSE flow meter has been carefully emptied, decontaminated and thoroughly cleaned both inside and outside, removing all residues.**

The following cleaning agents were used: (Safety data sheets must be enclosed). _____

Declaration of non-objection
(Decontamination declaration for return deliveries)

3. ◯ **No special safety measures or treatments are necessary.**

◯ **Special safety measures or treatments concerning employee protection, environmental protection, and/or disposal are required due to residual contamination, residual liquids, residual substances, solids, and/or used cleaning agents. (Safety data sheets must be enclosed.)**

If yes, which: _____

4. ◯ **Are there any other safety aspects to consider?**

If yes, which: _____

We confirm that the information provided in this declaration is true and complete and that the shipment is carried out in accordance with legal regulations. We are aware that we are liable to VSE and its sales partners for any damages caused by incomplete and incorrect information. We commit to indemnify VSE and its sales partners against any claims for damages by third parties arising from incomplete or incorrect information, irrespective of the legal basis on which such claims may arise.

Company _____

Street/No. _____

Postal code/City _____

Phone _____

Email _____

Contact person _____

(In capitals)

Date _____

Signature _____

(Company stamp)

Enclosures _____

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