

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 Volutentechnik 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 flow circuits of the turbine, the warranty as well as the product liability by VSE expire.

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 install 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 be 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

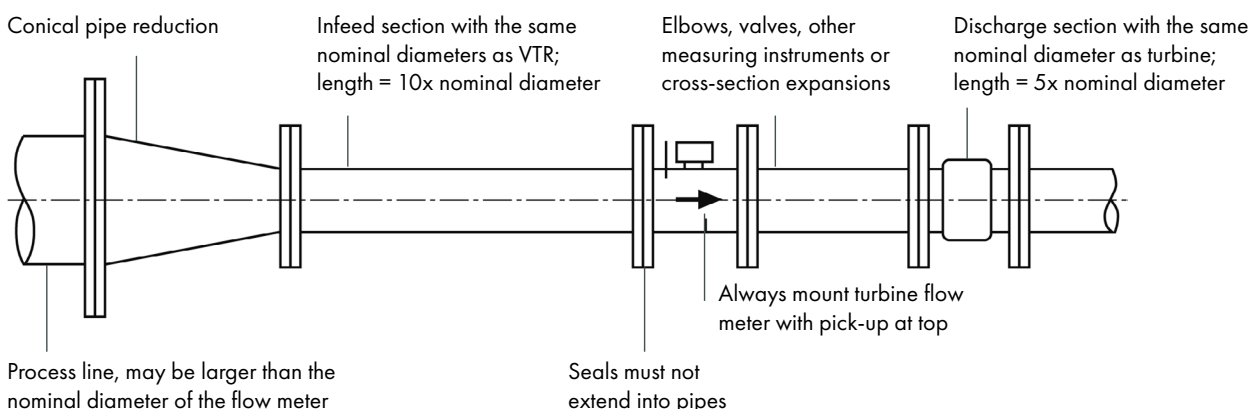
The operating pressure behind the turbine sensor must be sufficient to prevent the medium from gassing out at elevated temperatures. The system pressure should be 2 bar above the corresponding vapour pressure.

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

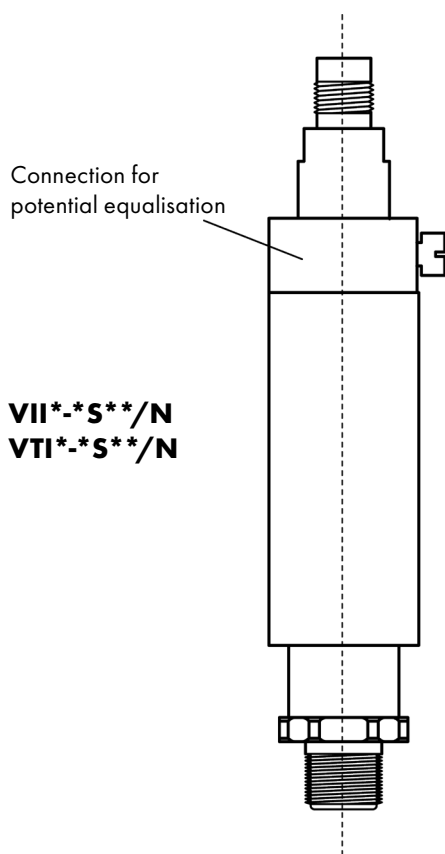
For exact information please contact VSE.



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

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

(*) Depends on the VHM flow meter size



Dimensions

$\varnothing = 25 \text{ mm}$; length = 119 mm

Pin No. 2
(line color white)
Signal output PNP

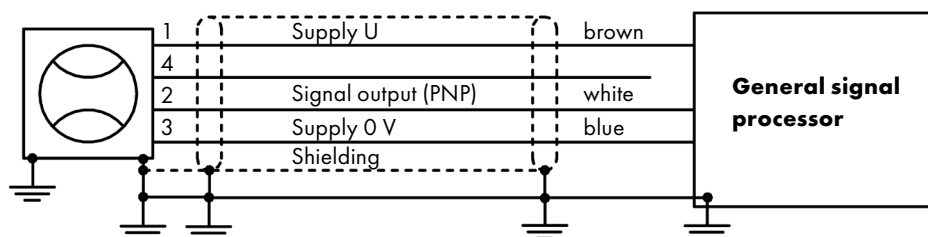
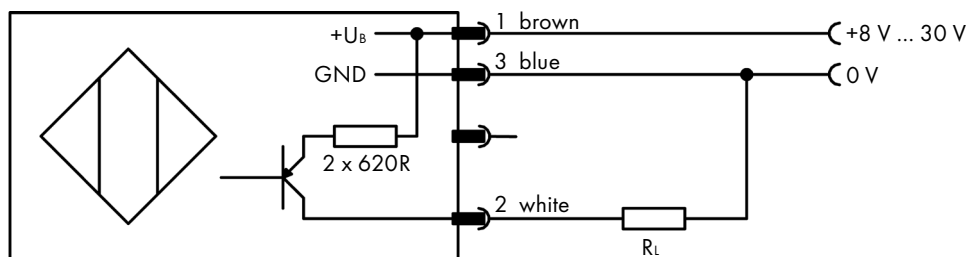
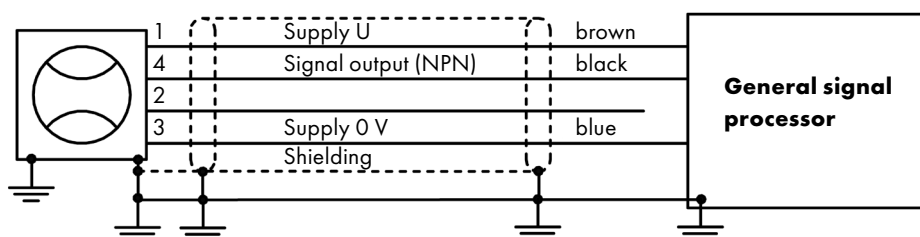
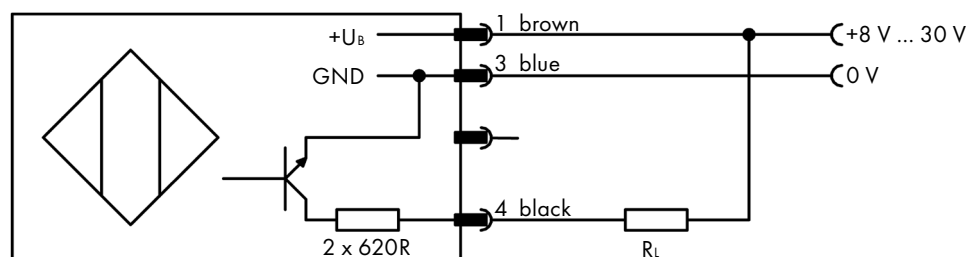
Pin No. 1
(line color brown)
Power supply U

Pin No. 3
(line color blue)
Power supply OV

Pin No. 4
(line color black)
Signal output NPN



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 therefore the specific properties of the units are limited by wear, corrosion, deposits or ageing. The operator is responsible for regular inspection, maintenance and recalibration. Any observation of a malfunction or damage prohibits further use. On request, we can provide you with a loan unit for the duration of the overhaul.

We recommend an annual check and recalibration. Under normal operating conditions, the service life is 10,000 hours. The warranty period is 12 months.

6. STORAGE, RETURN AND DISPOSAL

Temporary storage

The units must not be exposed to temperatures below -20°C or above +60°C and must be protected from moisture and its effects.

Return

1. The turbine must be properly cleaned by the customer before being returned to prevent the risk of poisoning/contamination by harmful, explosive and other high-risk pumped media for humans and the environment.
2. If media have been conveyed whose residues with atmospheric humidity lead to corrosion damage or ignite on contact with oxygen, the turbine must be additionally neutralised and thoroughly cleaned with anhydrous, inert gas to dry.
3. The return of the turbine must always be accompanied by a fully completed declaration of no objection (see page 23). All applied safety and decontamination measures must be indicated.
4. When returning the turbine, it must be packed in accordance with the applicable logistics standards and sealed with sealing plugs.

Disposal

VSE actively promotes environmental protection and is certified according to DIN EN ISO 14001 (Environmental Management). The impact on the environment and people should be minimised during the production, storage, transport, use and disposal of our products and solutions.

- Collect rinsing liquid as well as residual liquid and dispose of it in accordance with the statutory provisions and regulations.
- Wear protective clothing and protective mask/+ goggles if necessary.

Materials must be disposed of properly as follows:

- Metal
- Plastics
- Electronic components
- etc.

When disposing of the materials, ensure that the waste-relevant rules and regulations of the respective country of destination are observed!

7. CERTIFICATE OF NON-OBJECTION



SAFETY DECLARATION FOR RETURN DELIVERIES (CERTIFICATE OF NON-OBJECTION)

Last revised: 10/2021

Please reply to info@vse-flow.com

Turbines, for which this certificate of conformity has not been completed and signed, cannot be inspected or repaired for safety reasons and will be returned unchecked at your expense.

Article number	
Quantity	
Reason for return	

The turbine was used in health/environmentally hazardous media.

☐ No

☐ Yes

The turbine is free from residuals.

☐ No

☐ Yes

Special safety measures or treatment is necessary or expected.

☐ No

☐ Yes

The turbine was last used with the following media:

If yes, which

Solvents	<input type="radio"/> No	<input type="radio"/> Yes *	
Toxic liquids	<input type="radio"/> No	<input type="radio"/> Yes *	
Biologically active liquids	<input type="radio"/> No	<input type="radio"/> Yes *	
Radioactive liquids	<input type="radio"/> No	<input type="radio"/> Yes *	
Corrosive liquids	<input type="radio"/> No	<input type="radio"/> Yes *	
Alkali	<input type="radio"/> No	<input type="radio"/> Yes *	
Explosive liquids	<input type="radio"/> No	<input type="radio"/> Yes *	
Other media	<input type="radio"/> No	<input type="radio"/> Yes *	

* Please add the safety data sheet for the medium in the appendix.



SAFETY DECLARATION FOR RETURN DELIVERIES (CERTIFICATE OF NON-OBJECTION)

Please reply to info@vse-flow.com

The undersigned assures that the above information is correct and complete and the shipping is carried out according to legal regulations. The undersigned is liable for all damages which arise as a result of the non-marked decontamination of the returned turbine.

VSE expressly points out that repairs and verification work is carried out by trusting the correctness of the completion of this safety declaration (certificate of non-objection). Should physical injuries, death or even damage to property occur, claims for damages will be asserted.

Company

Street / Building no.

Postcode / Town

Phone

Fax

Email

Contact

(in capitals)

Date

Signature

(company stamp)

Enclosed



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