

## Product Information

## Sensors and Instrumentation

# Function and benefits

The VHS measurement systems have been designed for flow measurement and monitoring of viscous, self-lubricating media (oils, etc.). The fluid fills the defined space between the gears and the wall, and is transported onwards by its own energy of flow. Here, a magnetically pre-tensioned Hall sensor detects a pulse according to the intermediate gear volumes transported. The current value is proportional to the detected frequency.



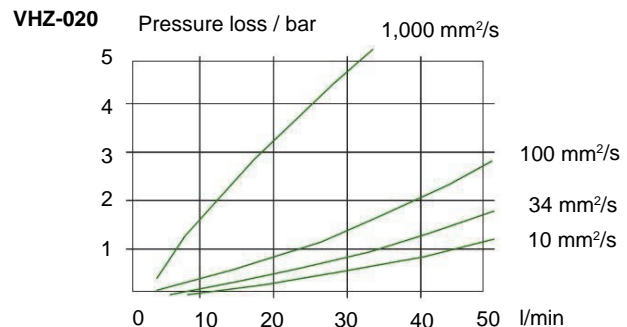
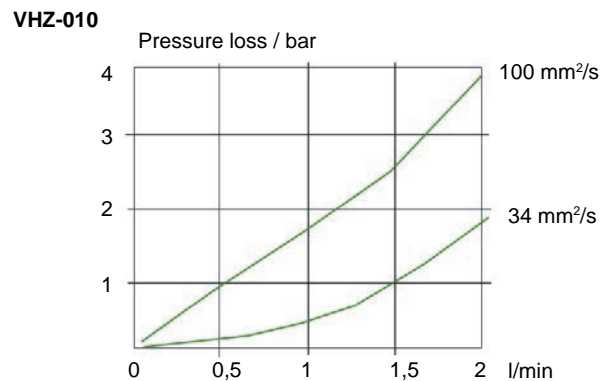
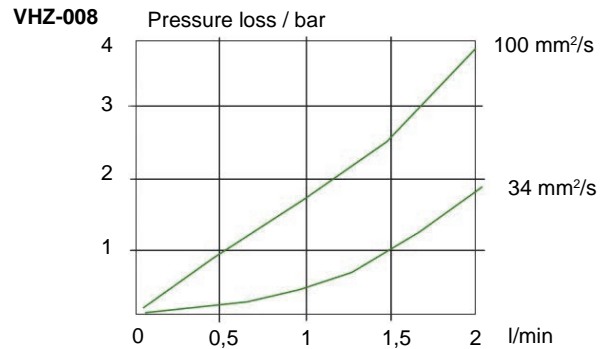
- Ranges from 0.04..150 l/min (G 1/4..G 1)
- Large viscosity independence due to volumetric measurement process (fluids, oils, paints, pastes with self-lubricating character).
- Precision better than 3 % of the measurement value (better with higher viscosities)
- Low production spread
- Position-independent operation
- Bi-directional operation possible (with A / B signals, direction detectable)
- Intrinsically safe behaviour (operational failure creates error message)
- No magnets in the flow area (detection by external pre-tensioned Hall sensor)
- Operating pressure up to 200 bar
- Temperature range up to 150 °C
- Frequency output in a wide range linear (measurement range 1:50)
- Analog measuring transducer through screw-on electronics or possible with external converter (then a display and switching points can also be realised)
- LABO, FLEX, OMNI compatible
- Universal local counters possible

With oils, for example, different viscosities arise as operating temperatures vary. Here, in addition to the Coriolis principle, the volumetric principle offers the best measurement results. The diagram shows good independence from viscosity. The higher the viscosity, the smaller the leakage error.

## Diagrams

### Pressure loss / Viscosity / Flow rate

The pressure loss results from the flow rate and the viscosity of the fluid being measured. Larger viscosities create larger pressure losses. Higher viscosities than those listed here are easily possible, but require a higher pump capacity.

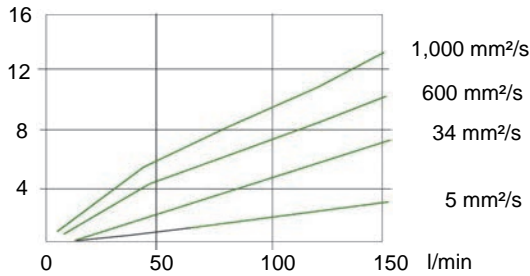


## Product Information

## Sensors and Instrumentation

### VHZ-025

Pressure loss / bar

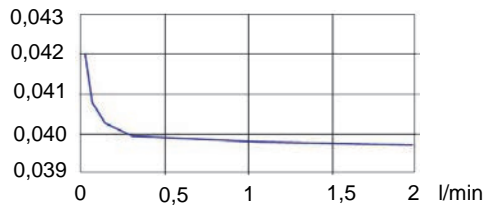


### Intermediate gear volume and flow rate

This ratio indicates the precision of the flow meter. With a limited metering range, greater precision can be provided. The precision also improves as the viscosity increases (test viscosity for the represented curves is 20 mm²/s).

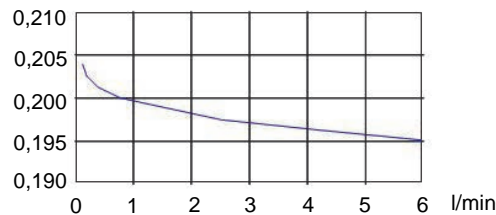
### VHZ-008

cm³



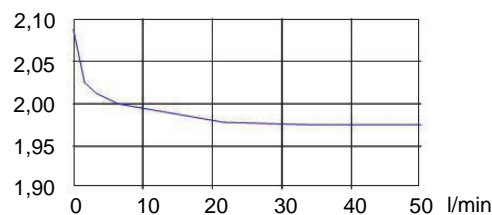
### VHZ-010

cm³



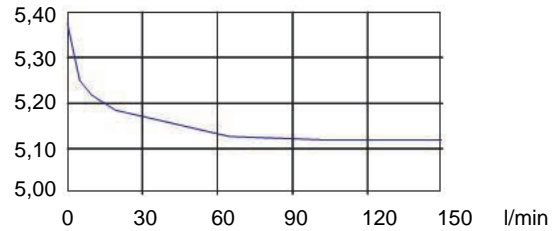
### VHZ-020

cm³



### VHZ-025

cm³



### Noise level and flow rate

#### VHZ-008

The noise development of the VHZ-008... at 2 l/min is < 50 dB

#### VHZ-010

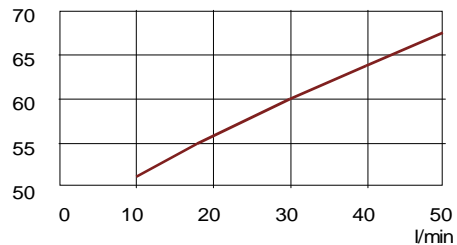
The noise development of the VHZ-010... at 6 l/min is < 50 dB

#### VHZ-025

The noise development of the VHZ-025... at 150 l/min is < 70 dB

#### VHZ-020

db (A)



The noise level always remains below the curve with the specified flow value. Test viscosity was 22 mm²/s. With a higher viscosity the noise level is lower.

### Combinations

Due to the high conformity of the gear measurement, the sensor electronics can be replaced arbitrarily. This makes it easier simply change the electronics if necessary or desired (exception: VHZ-08).



## Product Information

## Sensors and Instrumentation

### On the spot programming options

#### LABO-VHZ- I/U/F/C/S



Pulse programming on pin 2:  
Apply the supply voltage level for one second and save the current value as the final value (for analog outputs) or as a switching value (for limit value switches).

#### FLEX-VHZ



Programming with magnet clip:  
Hold the magnet to the marking for 1 second and save the present value as the final value (for analog outputs) or as a switching value (for limit value switches).

#### OMNI-VHZ



Programming with magnet ring:  
With the aid of the display and of the movable ring, numerous parameters can be conveniently set on the spot.

#### ECI-1



If required, all parameters can be set at any time on all intelligent sensors, using the ECI-1 device configurator.

### Comments

Filters of 30 µm mesh size should be used.  
If there is a possibility of ferritic abrasion, magnetic filters should be installed in the line upstream of the transmitter.

Installation downstream of a rapidly switching valve should be avoided because of the possible pulses in flow rate. Always install measuring equipment on the pressure side.

Gently starting pumps protect your instruments and pipe installations.