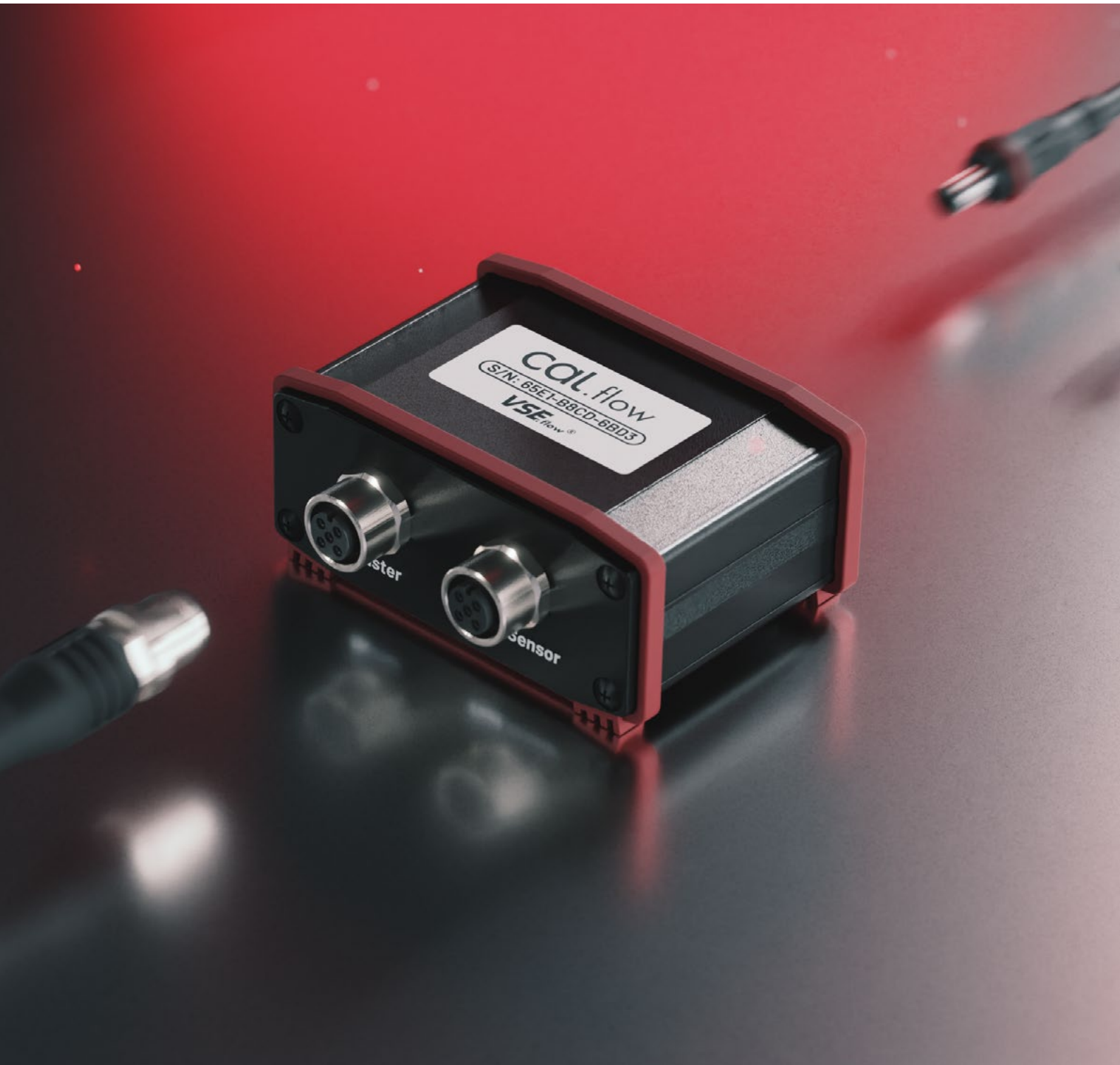
fluid
technology
solutions

VSE flow®

New calibration and datalogging systems



Flow calibration

cal.flow + EASYcal

The Cal.flow calibration system is used in conjunction with the EasyCal software to perform flowmeter calibrations with high precision. The process is guided though the PC software and results in a PDF calibration protocol with all measured values.

Highlights

- Calibration using master and test flowmeter using the reference principle with up to 24 master calibration points
- Measurement of the K-factor over an adjustable number of pulses
- Highly accurate frequency measurement and counting of both flowmeters
- Automatic calculation of accuracy and repeatability
- Customizable testing procedure
- Export as PDF or Excel-Spreadsheet
- Perfect for manually operated testbenches
- Real-time flowrate graphs

Data logging

log.flow + EASYgraph

Log.flow can be used as an excellent data logging tool. Using the PC Software EasyGraph, highly dynamic processes can be analyzed with sampling rates up to 1000 Hz. The flow rate and volume of both channels can be recorded simultaneously.

Highlights

- Dynamic and precise frequency measurement and pulse counter (adaptive period measurement)
- GPU-accelerated real-time graph of all 4 channels
- Adjustable sample rate (1-1000 Hz) and filter levels
- Math functionality to rescale input values (→units)
- Data recording with starting-trigger functionality
- Import/Export of recorded data with file viewer
- Fast creation of PDF reports for documentation
- Log.flow versions with a dedicated analog input channel (4..20 mA/0..10 V) are available on request

A versatile tool for flow measurement

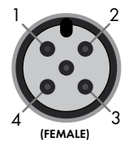
Product features

- Two new products:
  - Calibration system Cal.flow (Art. no.: 4880)
  - Datalogging system Log.flow (Art. no.: 4881)
- Portable, small size and easy to handle
- Waterproof design for robustness in the field
- Several power supply options possible:
  - Power via USB using integrated boost converter
  - External 24 V power supply using DC-Jack
  - Use of the existing 24 V supply of the connected flowmeters (e.g. by using T-Adapters)

Scope of delivery

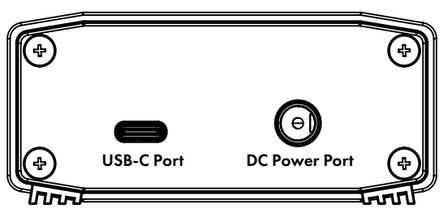
- USB measurement system
- 2x M12 connection cables (length: 1.5 m)
- 2x T-connectors for tapping on flowmeters in existing systems
- 1x USB Type-A to Type-C cable (length: 2 m)
- 24 V DC wall plug power supply with DC Jack
- Download link and device license for companion software (EasyCal or EasyGraph)

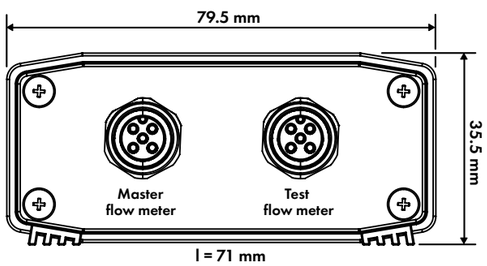
M12 Pinout



Pin 1: U_b = 24V
Pin 2: Channel A
Pin 3: Ground
Pin 4: Channel B*

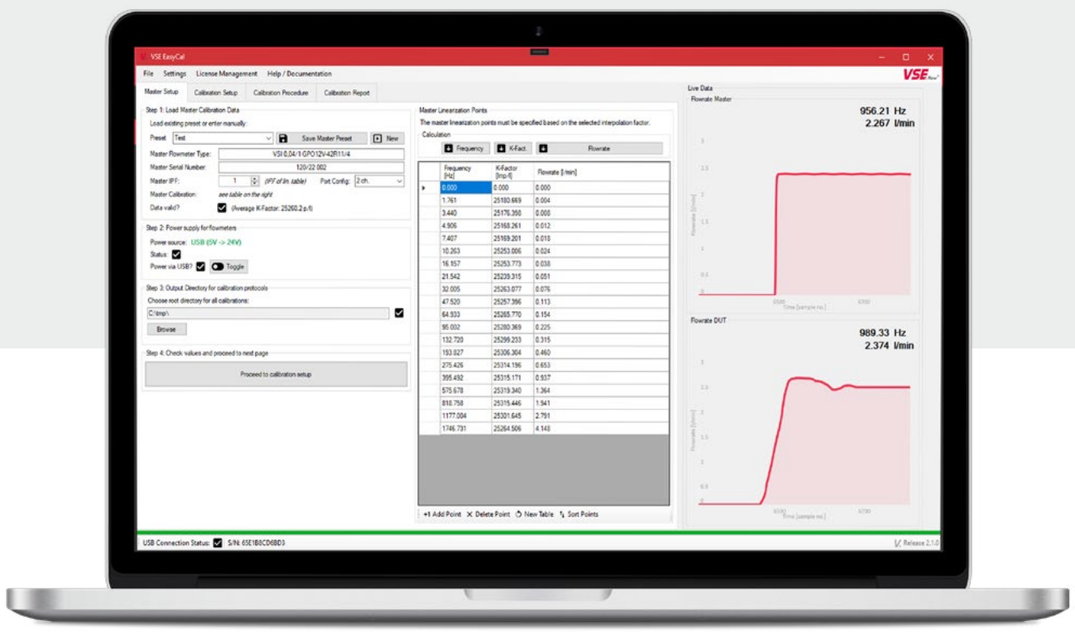
Technical drawing

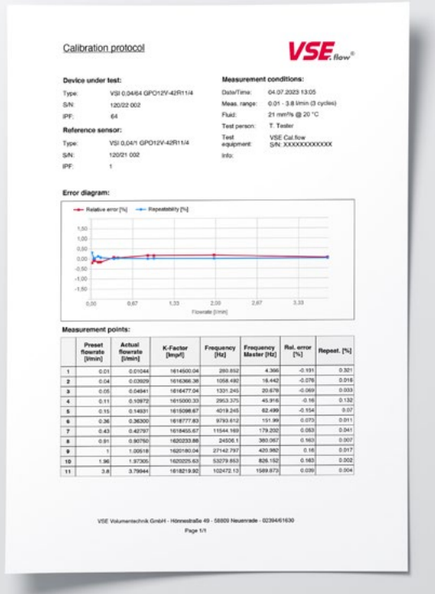




Flow calibration using EasyCal

from start to finish in 4 easy steps




Calibration protocol

Device under test:
Type: VSI 0,04/4 GPO12V-42R1 1/4
S/N: 120/22 002
IPF: 64

Reference sensor:
Type: VSI 0,04/1 GPO12V-42R1 1/4
S/N: 120/21 002
IPF: 1

Measurement conditions:
Date/Time: 04.07.2023 13:05
Meas. range: 0.01 - 3.8 l/min (3 cycles)
Fluid: 21 mm²/s @ 20 °C
Test person: T. Tester
Test equipment: VSE Cal.flow S/N: XXXXXXXXXXXX
Info:

Error diagram:

Measurement points:

	Preset flowrate [l/min]	Actual flowrate [l/min]	K-Factor [l/cyl]	Frequency [Hz]	Frequency Master [Hz]	Rel. error [%]	Repeat. [%]
1	0.01	0.01044	1614500.04	280.932	4.366	-0.191	0.301
2	0.04	0.03929	1616366.38	1058.480	16.442	-0.076	0.016
3	0.05	0.04941	1616477.04	1331.245	20.678	-0.069	0.033
4	0.11	0.10972	1615590.33	2953.375	45.916	-0.166	0.132
5	0.15	0.14831	1615096.67	4019.245	62.499	-0.154	0.07
6	0.36	0.36300	1616777.83	9793.812	151.99	0.073	0.011
7	0.43	0.42797	1616455.67	11544.169	179.232	0.053	0.041
8	0.91	0.90750	1620233.88	24506.1	380.067	0.163	0.007
9	1	1.00518	1620180.04	27142.797	420.982	0.16	0.017
10	1.96	1.97305	1620225.63	53279.853	826.192	0.163	0.002
11	3.8	3.79944	1618219.92	102472.13	1589.673	0.026	0.004

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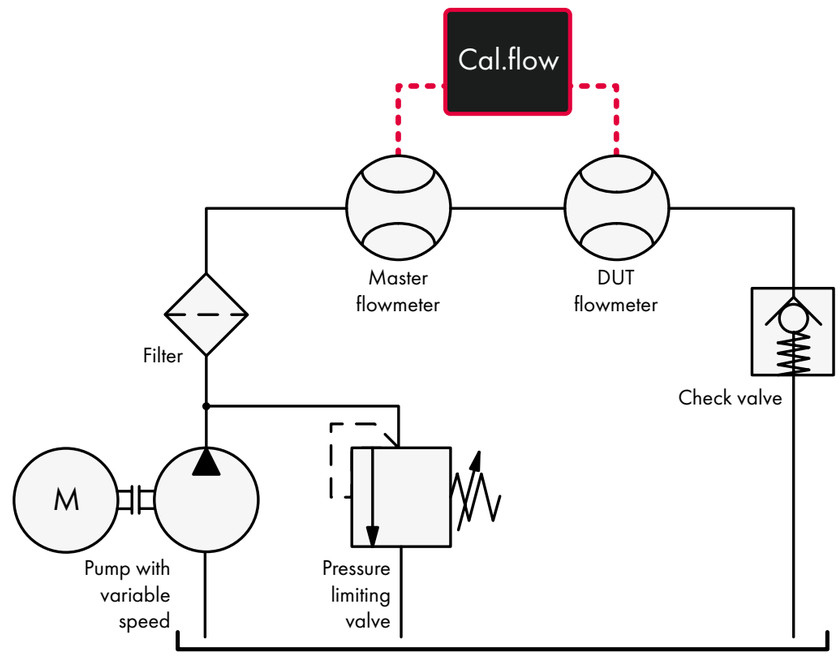
Resulting calibration protocol

The reference principle

Calibrations with the Cal.flow are performed using the reference principle. This means that an adjustable flow rate is passed in series through a calibrated master flowmeter and through the test device. The Cal.flow records the deviations between the two flowmeters for calculation of the specific K-factor of the test device.



Example of hydraulic setup

Additional features of the new system

- Fully customizable calibration parameters
- Adjustable number of reference pulses (= calibration volume)
- Flow hysteresis for steadyness check
- Assisted and manual calibration point calculation
- Optional time limit
- Up to 24 master calibration points
- Save and restore different masters/settings/fluids as presets
- Directly generate fully-featured calibration protocols
- Customize company data (e.g. logo and address) on the protocol

Comparison to previous version "VSE calibration box"

- Greatly improved measurement accuracy and resolution (compared to pulse comparison method)
- Elimination of measurement errors at the beginning and end of pulse counting
- Use of the more precise ratio-counting method based on a 100 MHz reference clock

Datalogging with EasyGraph v2.0

Easy-to-use measurement app compatible with the new Log.flow datalogging system

Understanding the flow

Did you ever wonder what is actually happening inside your fluid system? Do you have flow and pressure spikes that you want to analyze in detail?

Together with VSE's highly dynamic gear- and screw-type flowmeters, those fast flow phenomena can be easily detected and measured. Just use the included T-connectors to tap into your flowmeters to view and record the whole process.

Source: escha.net

Features and highlights

Key features

- Simultaneous flow and volume measurement
- Two channel measurement:
  - two quadrature inputs

  or
  - one quadrature input
  - one analog input
- Data recording with trigger functionality (Buffered recording: "before-it-even-happened")
- Highly dynamic and long-term measurements possible

Hardware specifications

- Three hardware options:
  - Standard-Version: Log.flow (Ord. no.: 4880): 2x Frequency/Counter input
  - Voltage-Option: Log.flow V (Ord. no.: 4881/V): 1x Frequency + 1x 0..10 V input
  - Current-Option: Log.flow I (Ord. no.: 4881/I): 1x Frequency + 1x 0..20 mA input
- Maximum recommended input frequency: 250 kHz
- Maximum sample rate: 1000 Hz
- Measurement accuracy: ≤0,005 %

Minimum system requirements

- 2 GHz dual-core processor (x64) or faster
- 64-bit Windows installation
- 4 GB RAM or more
- Graphics card or iGPU with DirectX11 support
- 200 MB free hard disk space
- Screen resolution: at least 1440x900 px
- USB 2.0 interface

Supported devices

- Log.flow datalogging system (recommended)
- Selected displays and F/U-converters sold by VSE

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