

V-Flow Line operating instructions



**Variable area flowmeters
and high-precision control valves
for gases and liquids**

Operating instructions *V-Flow Line*

Variable area flowmeters Q-Flow

Variable area flowmeters V-100

High-precision control valves M-Flow



Version: **vflow_E4_7**

For the latest information on our products, see our website at www.voegtlin.com

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Introduction

We are glad that you have decided to use our variable area flow meters and high-precision control valves. Our instruments will provide you with high-quality long-lived products.

This manual contains important information for commissioning and/or designing equipment. Please contact your distribution partner if anything is not clear.

We are committed to the continual improvement of our products and documentation. Your experience from everyday use can assist us with this. We welcome your comments and criticisms.

We have taken great care in compiling this manual. However, we cannot accept responsibility for possible errors.

Service and quality

We are continually improving the quality and provision of our products and services. In the end, whether the right product was selected only becomes apparent once the product is in use. Therefore we make every effort not just to preach but also to live by top quality and service.

Warranty

The warranty for the products described in this manual is limited to defects in material and workmanship. Warranty does in no case exceed product replacement free of charge. All claims are null and void in the case of improper use:

- Use outside the operating limits
- Damage due to water hammer
- Corrosion damage
- Mechanical damage in general

General instructions

Check the package for external damage and contact your distribution partner if the instruments have visible defects. Check that the delivery is complete and corresponds to the delivery note.

This product is a precision measuring instrument. We would like to point out that you should take due care when choosing the installation site and following these suggestions and instructions. Before installing, check that the specification on the type label matches your application.

Please read through these operating instructions carefully before commissioning. Incorrect operation, errors in comprehension and the consequences of these can lead to breakage of the instrument or risk of personal injury.

Commissioning and maintenance must be carried out by appropriately qualified personnel. Proper use of the products is a necessary precondition for their smooth operation.



Safety information

- The instruments must not be used outside the specified operating limits (See also section *Technical Data*)
- Incorrect operation can lead to breakage of the instrument or risk of personal injury.
- When using toxic media it is strongly advised not to use glass cylinder measuring instruments: cylinder breakage and leaks can cause risk of personal injury
- Shocks, e.g. caused by magnetic valves, should be avoided.
- The measuring instruments must be used solely for the medium specified in the delivery note. Media which differ from this may lead to impaired durability and therefore cause leakage

Using the manual

This manual contains information on the *variable area flowmeters* **Q-Flow** and **V-100** and *high-precision control valves* **M-Flow**.

Sections and paragraphs which only apply to a particular product group are marked as follows:



Variable area flowmeters Q-Flow



Variable area flowmeters V-100



High-precision control valves M-Flow

General information

Q
FLOW

Operating principle of the variable area flowmeter

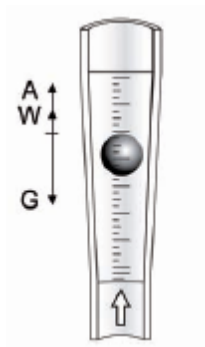
V
100

The measuring instrument works according to the float measuring principle

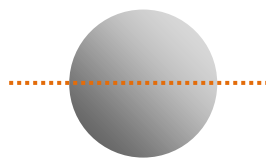
The measuring unit consists of a tapered graduated precision glass measuring cylinder in which a ball float can move freely up and down. The medium flows through the vertically-aligned measuring cylinder from the bottom upwards.

The float positions itself so that the *buoyancy force* **A** acting on it, the *form resistance* **W** and its *weight* **G** are in balance::

$$G = A + W$$



The flow rate can be read as the height of the float on a scale on the tapered measuring cylinder. The value is read off at the middle of the float (largest diameter).



Q
FLOW

Variable area flow meter type marking

V
100

The instrument type label is attached to the inside of the left side panel in the **V-100** and on the back of the mounting plate in the **Q-Flow**:

Example:

SN: 483493-1-006 07/08
 BE: 133526
 Type: FLV-CSSA-SM
 Air, 3.6-43 l/min, 4 bar a, 20°C
 mm-Scale
 www.voegtlin.com - +41 61 756 63 00

Key:

SN: Serial number – Position – number of instruments per position
 BE: Customer order number
 07/08: Date of manufacture, month/year
 Type: Specification in accordance with type code (standard instruments only) ¹

Medium, measuring range, measurement unit, pressure, temperature and additional information.

¹Custom designed instruments are given a seven digit product code instead of a type code (e.g. 137-1215).

M
FLOW

High-precision control valve type marking

For the **M-Flow** the type label is attached to the valve cartridge housing. An arrow on the body of the valve indicates the flow direction.

Example:



Key:

NS 2.5: Specification of valve size NS 1.0 to NS 6.5
 L: Closing direction for valve (L = left / R = right)
 V: Sealing material (V = FKM / E = EPDM / P = FFKM)

Custom designed instruments can have additional details such as leakage rate.

Technical data

Q
FLOW

Technical data Q-Flow

Type	Q-Flow 55	Q-Flow 80	Q-Flow 140
Turndown ratio	10:1	10:1	10:1
Accuracy in % of full scale	± 5 %	± 4 %	± 2 %
Measuring tube length	55 mm	80 mm	140 mm
Scale length	40 mm	65 mm	120 mm
Float	spherical	spherical	spherical
Max. pressure	20 bar	20 bar	16 bar
Max. pressure drop	100°C	100°C	100°C

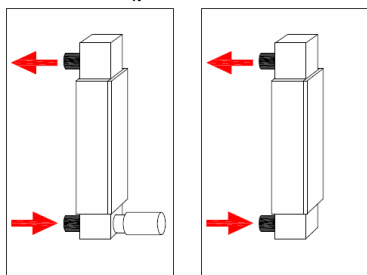
Materials Q-Flow

Component	Aluminium	Stainless steel
Top and base sections*	Anodized aluminum	Stainless steel 1.4305
Mounting plate	Anodized aluminum	Anodized aluminum
Measuring cylinder*	Borosilicate glass	Borosilicate glass
Connections*	Nickel-plated brass	Stainless steel 1.4305
Float*	SS 316 L / Glass / Ceramic	SS 316 L / Glass / Ceramic
Valve*	Nickel-plated brass	Stainless steel 1.4305
Seals*	FKM	FKM/EPDM
Front cover	Makrolon (Polycarbonate)	Makrolon (Polycarbonate)
Shock absorbing limit stop*	Stainless steel 1.4305 / PTFE	Stainless steel 1.4305 / PTFE

*Wetted parts

Setups Q-Flow

Standard (process connection on the back)



With valve

Without valve

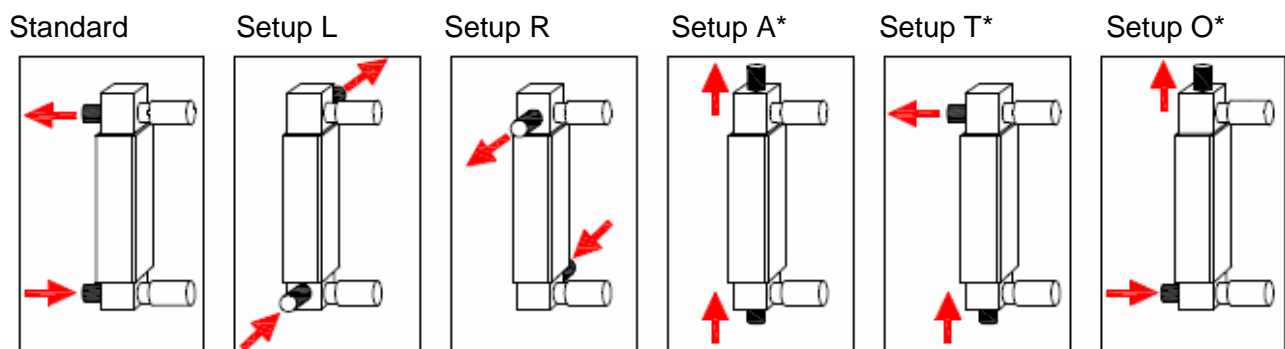
V
100**Technical data V-100**

Type	V-100 55	V-100 80	V-100 140
Turndown ratio	10:1	10:1	10:1
Accuracy in % of full scale	± 5 %	± 4 %	± 2 %
Measuring tube length	55 mm	80 mm	140 mm
Scale length	40 mm	65 mm	120 mm
Float	spherical	spherical	spherical
Max. pressure	20 bar	20 bar	16 bar
Max. pressure drop	100°C	100°C	100°C

Materials V-100

Component	Aluminium	Stainless steel
Top and base sections*	Anodized aluminum	Stainless steel 1.4305
Mounting plate	Anodized aluminum	Anodized aluminum
Measuring cylinder*	Borosilicate glass	Borosilicate glass
Connections*	Nickel-plated brass	Stainless steel 1.4305
Float*	SS 316 L / Glass / Ceramic	SS 316 L / Glass / Ceramic
Valve*	Nickel-plated brass	Stainless steel 1.4305
Seals*	FKM	FKM/EPDM
Front cover	Makrolon (Polycarbonate)	Makrolon (Polycarbonate)
Shock absorbing limit stop*	Stainless steel 1.4305 / PTFE	Stainless steel 1.4305 / PTFE

*Wetted parts

Setups V-100 (position of the process connection)

*A, T and O-Type in stainless steel only



Technical data M-Flow

Type	M-Flow 25	M-Flow 35	M-Flow V-Stack
Straight valve	●	●	
Corner valve	●		
Valve insert/cartridge	●	●	
Gas distribution system			●
Ccw-closed	●		
Valve turns	15	15	15
Valve size	NS 1.0 bis 3.0	NS 4 und 6.5	NS 4 und 6.5
Leak rate	$<1 \times 10^{-5}$ mbar l/s He	$<1 \times 10^{-5}$ mbar l/s He	$<1 \times 10^{-5}$ mbar l/s He
Max. pressure	20 bar	20 bar	20 bar
Min. temperature	-40°C	-40°C	-40°C
Max. temperature	150°C	150°C	150°C

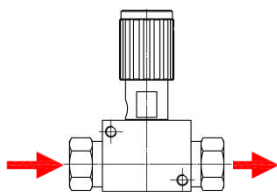
Materials M-Flow

Component	Aluminium	Edelstahl
Valve*	Anodized aluminum	Stainless steel 1.4305
Valve insert/cartridge *	Nickel-plated brass	Stainless steel 1.4305
Connections*	Nickel-plated brass	Stainless steel 1.4305
Seals*	FKM	FKM/EPDM/FFKM

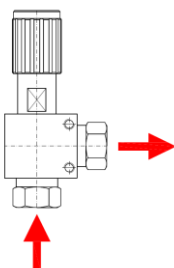
* Wetted parts

Setups M-Flow

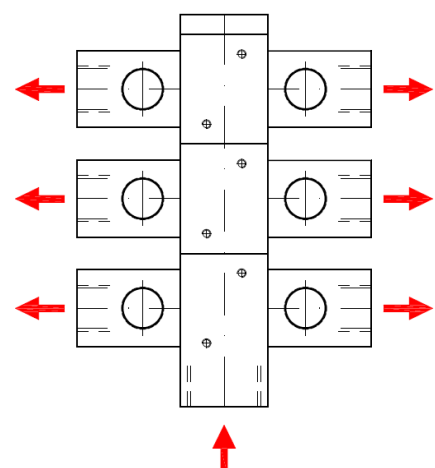
Straight valve



Corner valve



Distribution system V-Stack

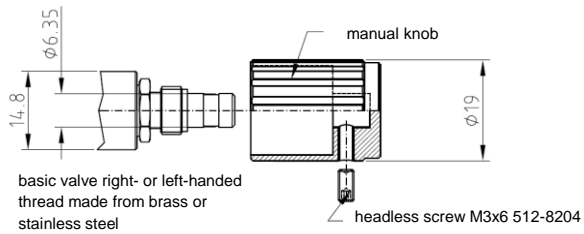




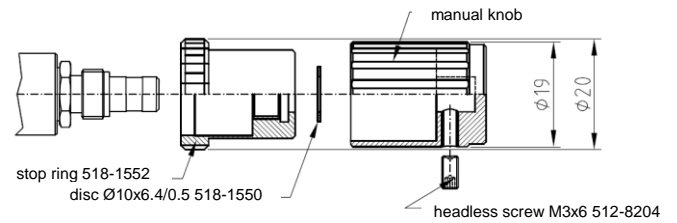
M-Flow valve operation options

The following valve operation options are available (see also the type code of each instrument):

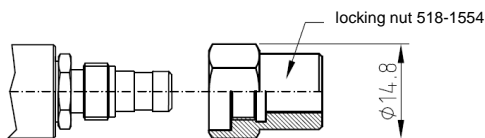
Standard-knob



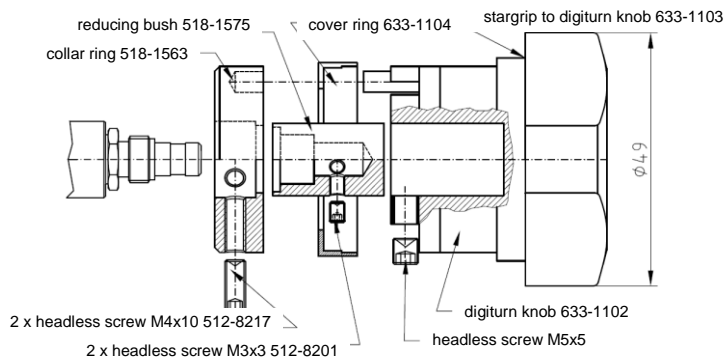
Standard-knob with locking ring



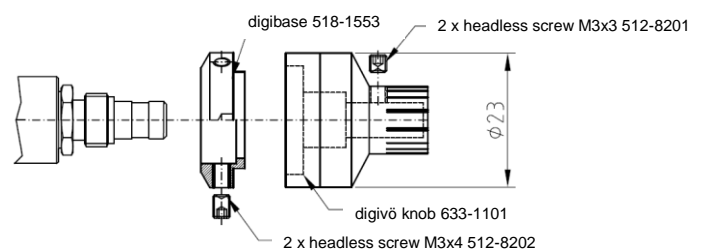
Hex socket and locking nut (instead of standard-knob)



Digiturn with indication (100 divisions, cw-closed valve only)



Digi-knob (100 divisions, ccw-closed valve only)



Measuring ranges variable area flowmeters

Measuring ranges direct reading scales ln/h (Air) and l/h (Water)

Medium	Air, l/n/h			Water, l/h	
	1.21 bara, 20°C			20°C	
Conditions					
Type	Q-Flow 55 V-100 55	Q-Flow 80 V-100 80	Q-Flow 140 V-100 140	Q-Flow 55 V-100 55	Q-Flow 140 V-100 140
	0.12-1.2	0.12-1.2	-	-	-
	0.2-2	0.2-2	0.2-2	-	-
	0.3-3	0.3-3	0.3-3	-	-
	0.5-5	0.5-5	0.5-5	-	-
	0.8-8	0.8-8	0.8-8	-	-
	1.6-16	1.6-16	1.6-16	-	-
	4-40	4-40	4-40	-	-
	6-60	6-60	6-60	0.25-2.5	0.25-2.5
	10-100	10-100	10-100	0.5-5	0.5-5
	25-250	25-250	25-250	1.2-12	1.2-12
	50-500	50-500	50-500	2.5-25	2.5-25
	80-800	80-800	80-800	4-40	4-40
	120-1200	120-1200	120-1200	6-60*	6-60
	140-1400*	-	140-1400*	7-70*	7-70
	-	-	200-2000*	-	-

*ranges available for V-100 instruments only

Q FLOW Measuring ranges direct reading scales mln/min and ln/min (Air)

Medium	Air, mln/min	
Conditions	1.013 bara, 20°C	
Type	Q-Flow 80 / V-100 80	Q-Flow 140 / V-100 140
	10-120	10-100
	20-240	40-220
	60-640	50-540

Medium	Air, ln/min	
Conditions	1.013 bara, 20°C	
Type	Q-Flow 80 / V-100 80	Q-Flow 140 / V-100 140
	0.1-1	0.1-1
	0.3-2.2	0.2-2.2
	0.5-5	0.5-6.0
	0.2-10	1.5-10.5
	2-20	2-26
	4-32	6-51

Q FLOW Measuring ranges mm-scale Q-Flow

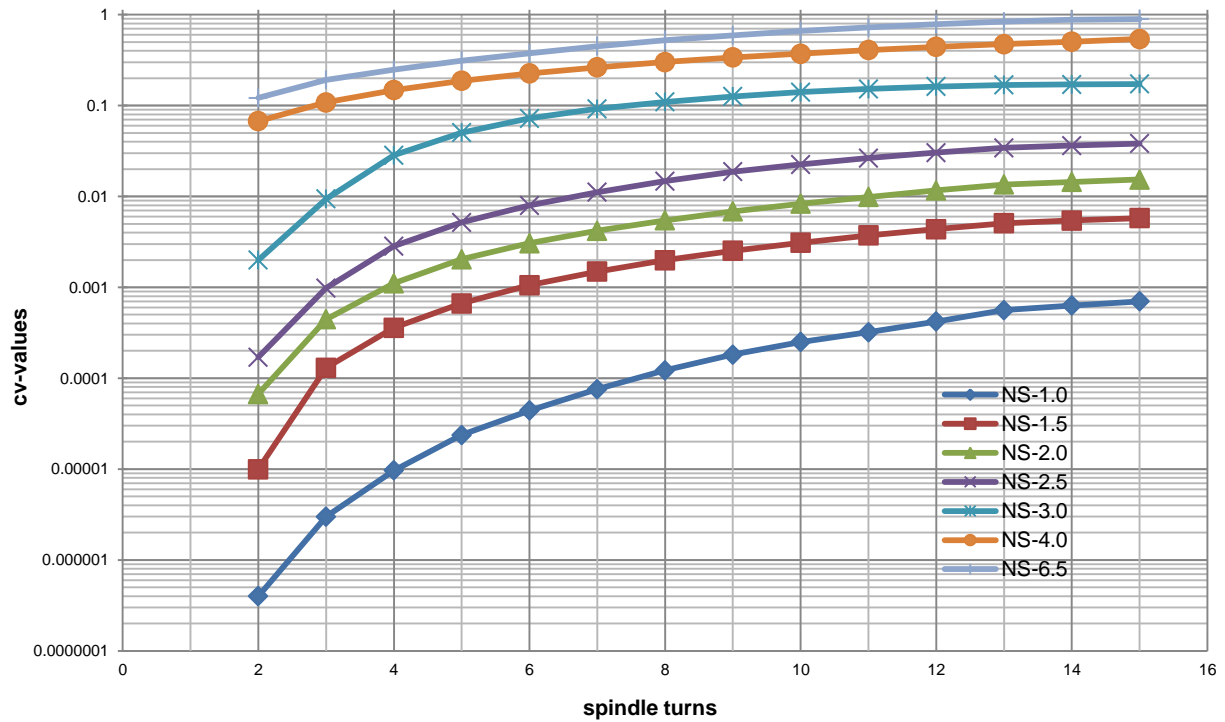
Medium	Air, ln/h		Water, l/h	
Conditions	1.21 bara, 20°C		20°C	
Measuring range	smallest	highest	smallest	highest
Q-Flow 80	0.04 – 1.75	850 – 3000	0.001 – 0.03	0.8 – 40
Q-Flow 140	0.15 – 2.25	500 – 5000	0.002 – 0.03	12 – 150

V 100 Measuring ranges mm-scale V-100

Medium	Air, ln/h		Water, l/h	
Conditions	1.21 bara, 20°C		20°C	
Measuring range	smallest	highest	smallest	highest
V-100 80	0.04 – 1.75	100 – 5000	0.0005 – 0.015	10 – 100
V-100 140	0.15 – 2.25	500 – 5000	0.001 – 0.018	12 – 150

M FLOW C_v -values high-precision control valves M-Flow

C_v -values valves NS1.0 to NS6.5



C_v -value 1 = 1 m³/h water at Δp of 1bar

Installation and commissioning

General instructions

Measuring instrument design

In addition to the type code (see appendix) we require you to supply the following information for optimal design of the instrument:

- Medium
- Maximum flow rate
- *For design without valve:* Pressure in measuring cylinder
- *For design with valve:* Pressure before and after the control valve
- Temperature

When should the control valve be mounted at the outlet?

- In vacuum processes the gas expands considerably. This leads to significant measurement errors.
The control valve should therefore always be placed at the outlet for vacuum applications.
- Liquids often contain gas bubbles. These settle on the float. This results in a higher flow rate being displayed. By installing the control valve at the outlet the gas bubbles become smaller and are better able to flow past the float.
- In the case of fluctuating back pressure (e.g. when gassing a liquid container if the level varies markedly).
- In the case of pulsating media or smaller water hammer the valve at the outlet has a cushioning effect.

When should the control valve be mounted at the inlet?

- In the case of constant after-pressure
- If the control valve also has to serve as a locking valve. (e.g. if a measuring cylinder has to be exchanged when installed).

Direct reading scale or mm-scale?

The *direct reading scale* (also known as the *product scale*) is determined for only one operating condition.

The *mm-scale* is not dependent on the medium, pressure and temperature. Different tables with various operating conditions can be used. The actual measurement value is not visible directly on the instrument but is read using a conversion table.

What is the purpose of standard liters and norm liters?

In contrast to liquids, gases can be compressed, so it is important to know the *density* of the gas used. This in turn is *dependent on pressure and temperature*, i.e. if two quantities of gas are to be compared with one another, then the current pressure in the pipe and the current temperature of the medium must be known.

We supply general tables relating to norm liters 0°C 1013 mbar a

The two quantities are defined as follows:

Unit	Pressure	Temperature
Standard liter	1013.25 mbar a	20°Celsius
Norm liter	1013.25 mbar a	0° Celsius

The US standard liter corresponds to the German norm liter (0°C 1013.25 mbar a).

However, there are other reference temperatures. Gas suppliers use a reference temperature of 15 °C.

Conversion of standard liter (Stdl) into norm liter (In) and vice versa:

$$\text{Stdl} = (\text{In}/273.15) * 293.15$$

$$\text{In} = (\text{Stdl}/293.15) * 273.15$$

Further information on this subject is given in the FAQs at www.voegtlin.com

Installation instructions

- Before installing the measuring instrument, the pipe must be free of particles and moisture
- The variable area flowmeter must be installed in a vertical position
- The direction of flow is from the bottom upwards
- The measuring instrument must be installed stress-free. Please use the mounting holes provided for this purpose
- The process connections must not be sealed with sealing tape or liquid sealer. Residues might enter the instrument and lead to defects
(See also paragraph *Recommended connections*)
- Before commissioning, make sure that the connections are sealed

Instructions for commissioning

- The operating limits must not be exceeded
(See section *Technical Information*)
- Connect the control valve to the flow meter or other control element
- Open the media supply
- Slowly open the control valve and set the required set value
(See also section *Operating principle of the variable area flow meter*)

Recommended connections

We recommend the following connections:

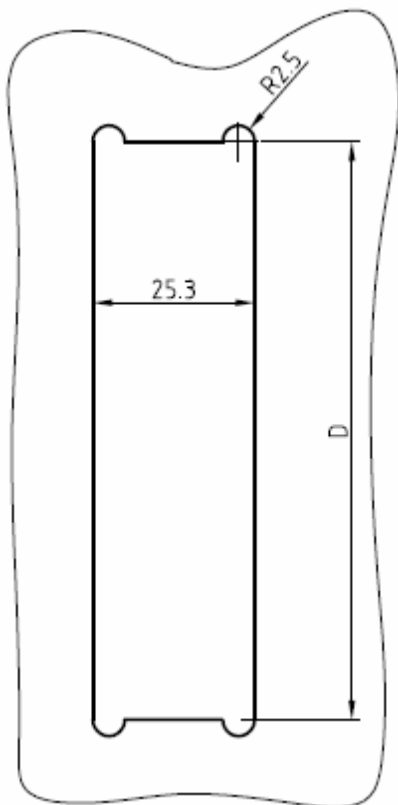
- Pneumatic plug-in connection with O-ring or flat seal
- Compression ring connection with O-ring or flat seal
- Screw-in hose connection with O-ring or flat seal
- Hose connectors with flat seal

Please note the available connection versions for our instruments and our range of accessories.

Panel mounting Q-Flow

- For mounting, the panel opening must be prepared according to the diagram
- Screw the two mounting brackets onto the instrument as shown
- Screw the setscrew supplied into the connector and insert the instrument into the aperture from the front
- From the other side, hang the connectors in the openings of the mounting brackets
- The instrument can be secured by careful tightening of the setscrews.

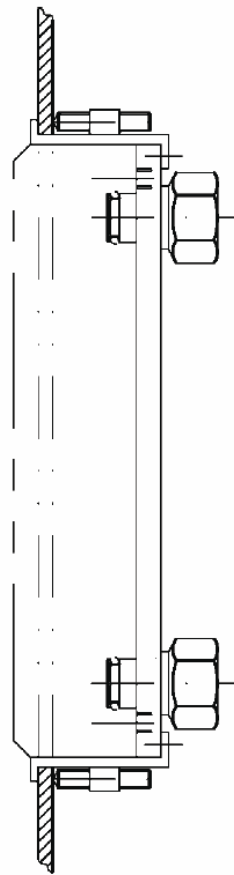
Panel aperture:



Dimensions in mm

Type	D
Q-Flow 55	104.3
Q-Flow 80	129.3
Q-Flow 140	189.3

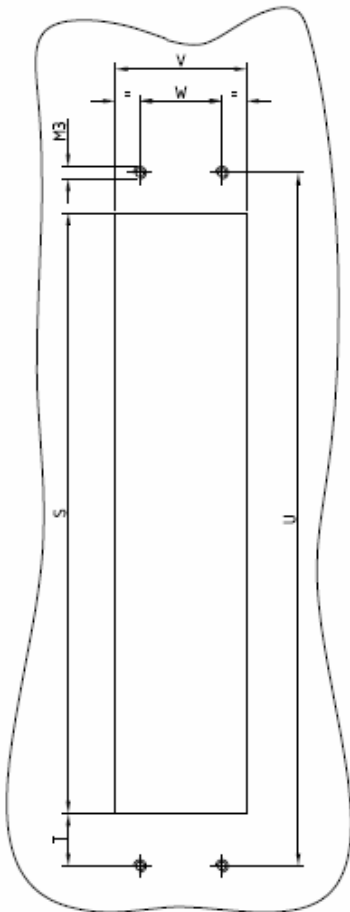
Mounting-Kit:



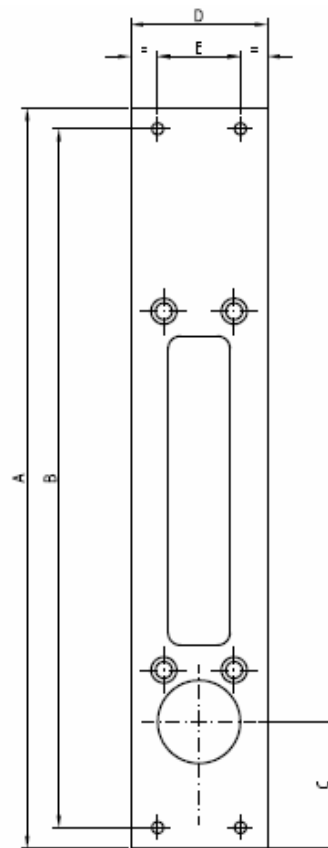
V 100 Faceplate mounting V-100

- For mounting, the faceplate must be prepared according to the diagram
- The instrument is supplied with mounted plate and inserted into the aperture from the front. Screw the plate to the control cabinet using suitable M3 screws
- For retrofit installation, unscrew the glass front of the instrument and fit the plate in place of this and install as described above

Panel aperture:



Mounting-Kit:



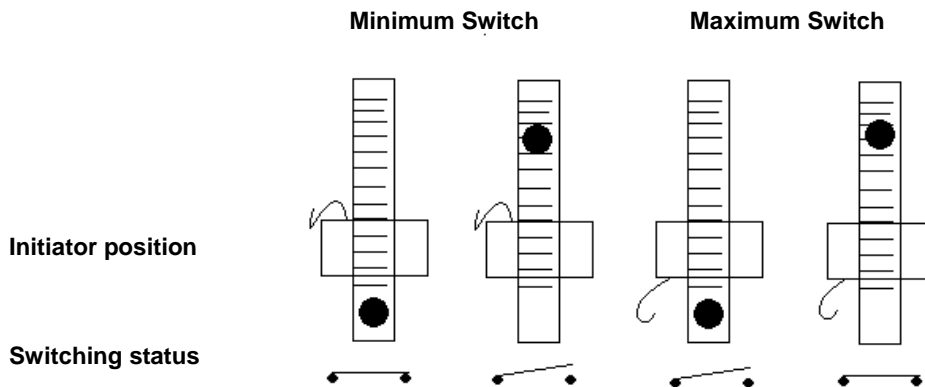
Dimensions in mm:

Type	Panel					Panel aperture				
	A	B	C	D	E	S	T	U	V	W
V-100 55	133.5	123.5	19.5	33	20	121	1.5	123.5	32	20
V-100 80	178	168	30.5	33	23	146	13	168	32	23
V-100 140	262	252	45	33	23	206	27.5	252	32	23

V **100** **Limit indicator**

The V-100 variable area flowmeters can be equipped with a maximum of two limit indicators.

The instruments with limit indicators have the following standard design:



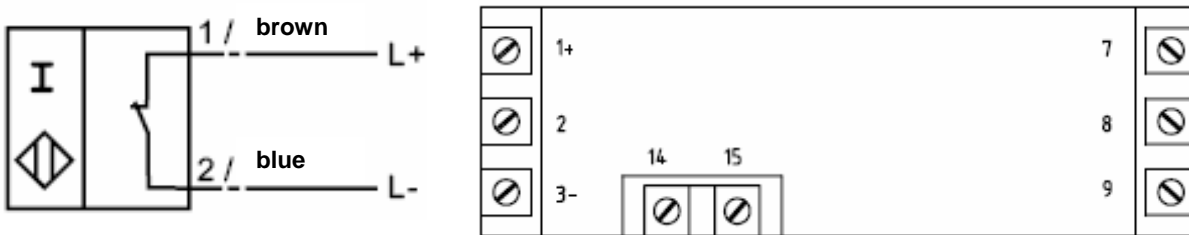
Note: In case of power failure, the contact closes irrespective of the position of the float.

For initialization, the float must first pass the initiator so that it is recognized by the initiator and the float position is defined.

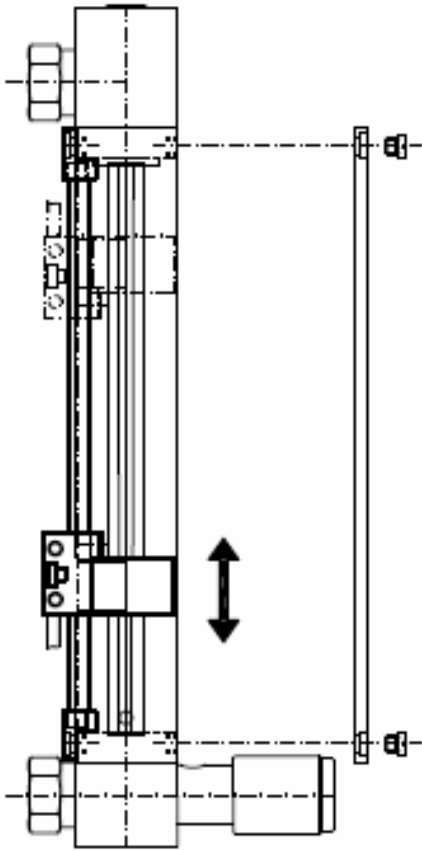
Wiring diagram

Limit indicator RC-10./RC-15, e.g. Pepperl + Fuchs Type KFD2-SR2-Ex1.W (24 VDC)

N3



Setting the limit indicator



- Remove the front glass (1)
- Unscrew both clamping screws (2)
- Position the limit indicator
- Tighten the clamping screws
- Fit the front glass

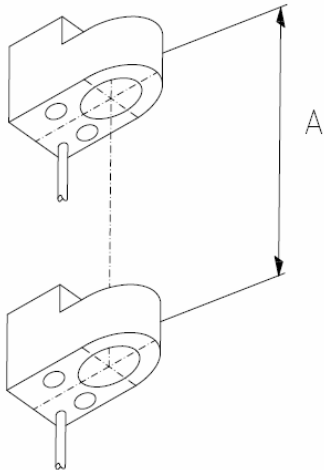
For retrofit installation of a limit indicator the measuring glass must be removed.

(See section *Disassembly and Maintenance*)

Minimum spacing for limit indicators

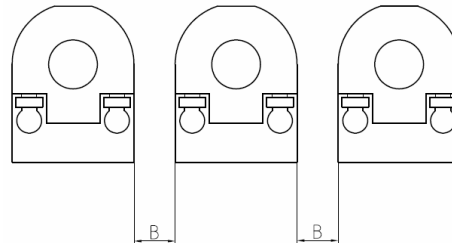
To ensure that the limit indicators do not interfere with one another a minimum space must be complied with.

Installed vertically in a measuring instrument:



A = Minimum 16 mm

Measurement instruments adjacent to one another:



B = Minimum 6mm

Areas of application

Limit indicators only work with steel variable area flowmeters.

Limit indicators can be used with the following measuring glasses:
(mm scale with flow rate table)

Limit indicator Type	RC-10...	RC-15...
V-100 80	80.05 to 80.12	80.13 to 80.17
V-100 140	140.07 to 140.12	140.13 to 140.19 ¹

¹Measuring glasses 140.17 and 140.18 not possible

For standard air and water scale see section *Variable area flowmeters measuring ranges*

M-Flow Digiturn installation

- Slide the adjusting ring 518-1563 onto the valve (do not tighten yet)
- Slide the adapter sleeve 518-1575 onto the valve axis and tighten the setscrews 512-8202
- Slide the rear part of the hand knob onto the adapter sleeve again. The pin on the knob must be pushed into the hole in the adjusting ring completely so that no gap remains
- By turning the adjusting ring 518-1563, the graduation on the knob can be set to the desired position. When this is done, tighten the two setscrews 512-8217 on the adjusting ring
- By turning the knob, the graduation can again be set to 00.00. When this is done, retighten the setscrew M5x5 on the knob
- Open up the cover ring 633-1104 and refit it over the gap
- The Digiturn knob is now fully installed

Disassembly and maintenance



Important instructions

- Close the valves before and after the measuring instrument
- Close the needle valve on the measuring instrument

Caution

When disassembling the measuring glass, residual liquids or gases may escape.

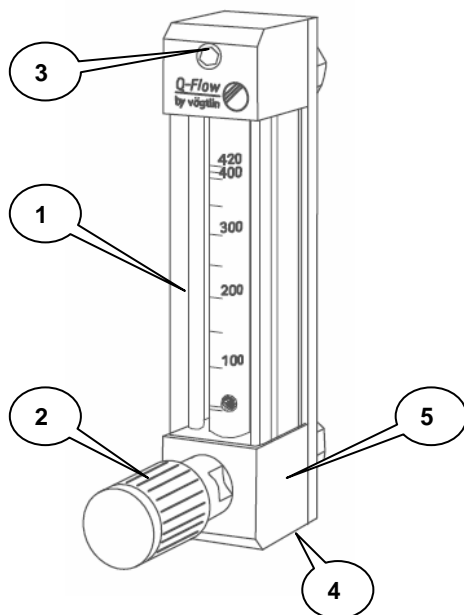
As the float is loose inside the measuring glass, care must be taken when removing it so that the float is not lost.

The same applies to the float stops.



Disassembly variable area flowmeter Q-Flow

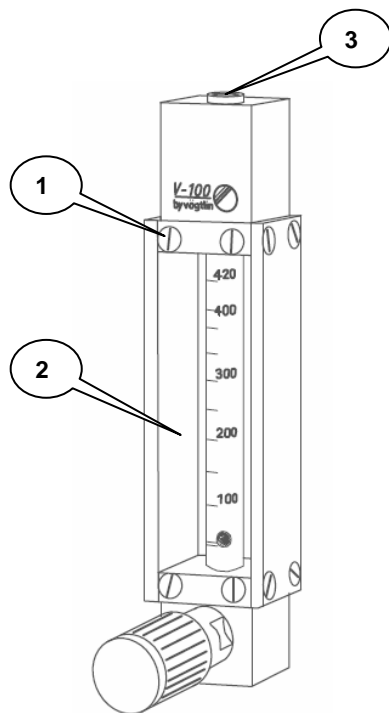
- Remove the Plexiglas cover (1) from the instrument
- Unscrew the valve (2) using an open-end wrench and remove it carefully from the instrument with a twisting motion
- Unscrew the cap screw (3) (hexagon socket, key size 4 mm)
- Pull the instrument off the mounting plate
- Unscrew the grip nuts (4) while holding the measuring glass firmly (hexagon socket, key size 3 mm)
- The measuring glass can be disassembled by lifting or removing the base section (5)



V
100

Disassembly variable area flowmeter V-100

- Remove the screws (1) and Plexiglas (2)
- Unscrew the locking screw (3) while holding the measuring glass firmly (hexagon socket, key size 5 mm)
- If the screw is loosened sufficiently, then the measuring glass can be removed



Refitting

Refitting is carried out in the reverse sequence:

- **V-100:** Tighten the locking screw (3) until the measuring glass stands by itself between the seals. Then tighten by $1\frac{1}{4}$ turns for FKM and EPDM seals and $\frac{3}{4}$ turn for PTFE seals
- **Q-Flow:** The grip nuts (4) can be tightened completely
- In order to prevent the glass from breaking, the measuring glass must be fitted centrally between the seals
- Before commissioning, check the leak tightness of the instrument

Disassembly Digiturn M-Flow

- Close the rotary knob or valve until the scale shows 00.00
- Open the cover ring 633-1104 and remove from the rotary knob
- Unscrew the M5x5 setscrew. The back part of the knob can be pulled off (hexagon socket, key size 2.5 mm)
- Unscrew the two setscrews 512-8202 on the adapter sleeve 518-1575. The adapter sleeve can be pulled off (hexagon socket, key size 1.5 mm)
- Loosen the two setscrews on the adjusting ring 518-1563. The ring can be pulled off (hexagon socket, key size 2 mm)
- The rotary knob is now completely dismantled from the valve

Maintenance

When used correctly, variable area flow meters from Vögtlin Instruments AG do not require any maintenance.

Soiling

The following symptoms indicate soiling:

- The set value can no longer be reached – the control valve is probably soiled
- The measuring value rises although the actual flow rate has not been changed – measuring cylinder is soiled
- Colour change / deposits in the measuring cylinder

Cleaning

Depending on the type of soiling, the measuring instrument can be rinsed with *isopropyl alcohol (IPA)*. The measuring cylinder can be mechanically cleaned with a brush at the most.

If soiled, we recommend that you return the measuring instrument to your distribution partner.

Return

When returning, please use the original packaging if possible or suitable alternative packaging. We do not accept responsibility for damage in transit. Please inform us of the reason for return: this enables us to process your request quickly.



Note

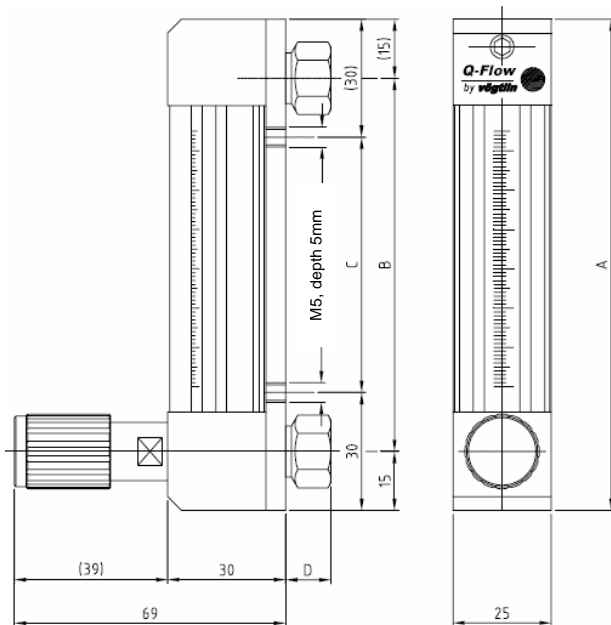
If the instrument has been in contact with corrosive or toxic media it is imperative to clean it properly before return. Please always complete the contamination declaration form. This is provided in the appendix to this manual.

Instruments which we receive without a contamination declaration form will unfortunately have to be returned to the sender.

Appendix



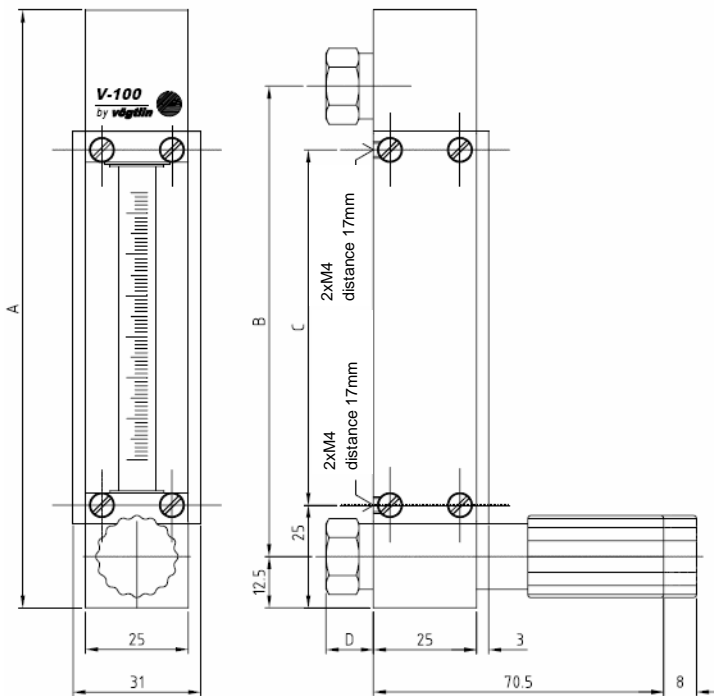
Dimensions Q-Flow



Type	Dimensions in mm		
	A	B	C
Q-Flow 55	100	70	40
Q-Flow 80	125	95	65
Q-Flow 140	185	155	125

Fitting	D	Thread depth
G 1/4" female	12	7
G 1/8" female	12	8
NPT 1/4" female	16	9
G 1/4" female for compression fittings	17	12

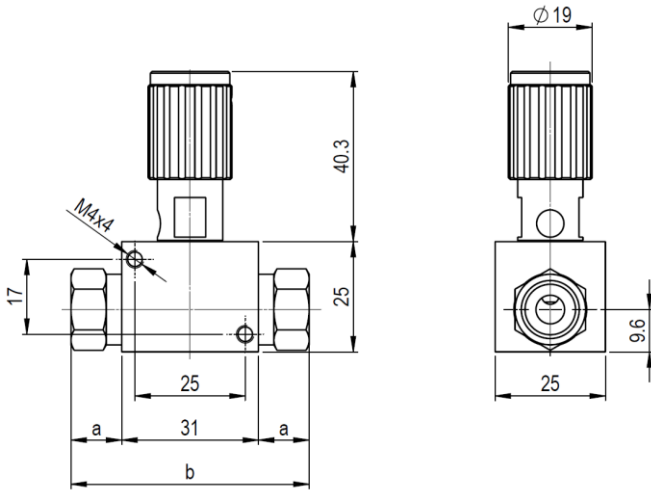
V 100 Dimensions V-100



Type	Dimensions in mm		
	A	B	C
V-100 55	120.5	89.5	61.5
V-100 80	145.5	114.5	86.5
V-100 140	205.5	174.5	146.5

Fitting	D	Thread depth
G 1/4" female	12	7
G 1/8" female	12	8
NPT 1/4" female	16	9
G 1/4" female for compression fittings	17	12

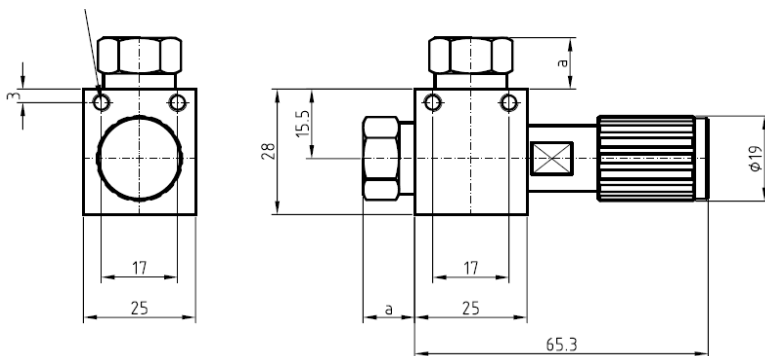
M FLOW
Dimensions M-Flow
M-Flow 25 straight valve



Fitting	Dimensions in mm		Thread depth
	a	b	
G 1/4" female	12	55	7
G 1/8" female	12	55	8
NPT 1/4" female	16	63	9
G 1/4" female for compression fittings	17	65	12

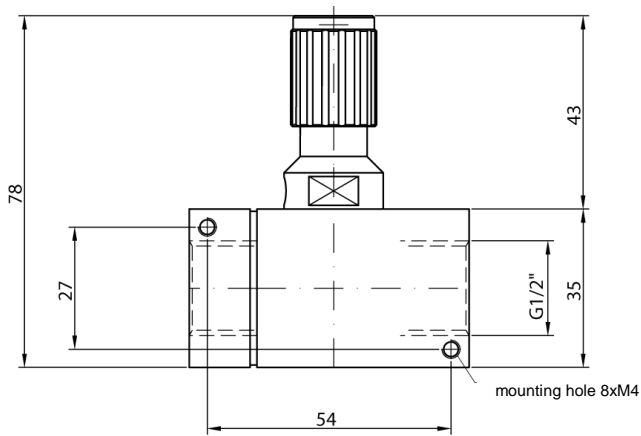
M-Flow 25 corner valve

8xM4
 depth 4mm

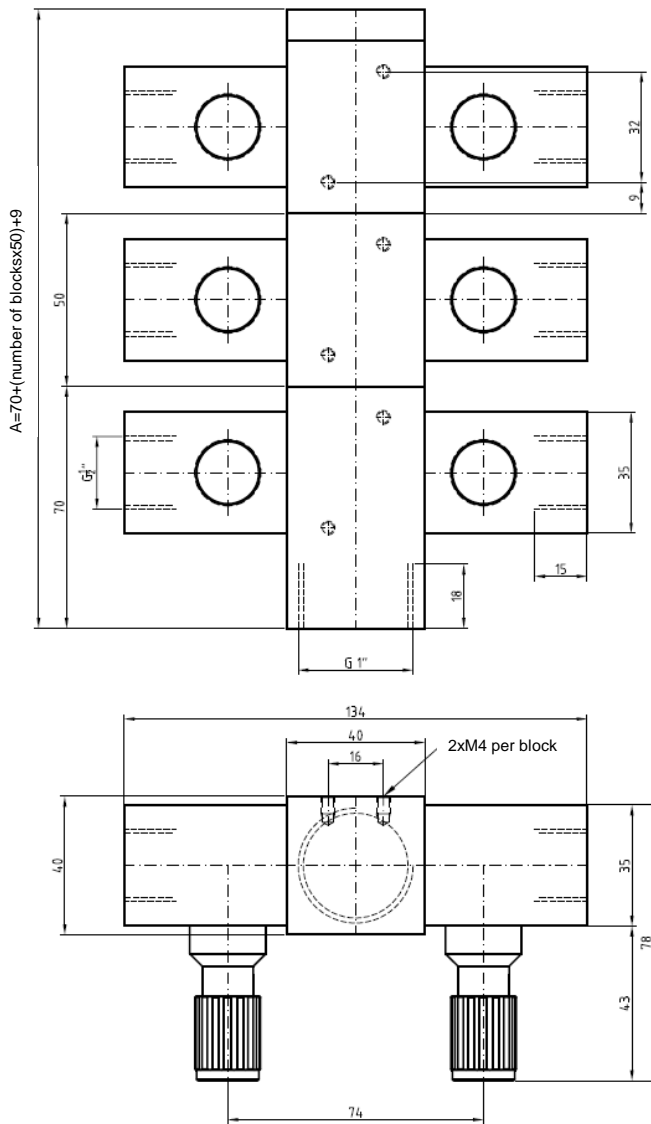


Fitting	Dimensions in mm		Thread depth
	a		
G 1/4" female	12		7
G 1/8" female	12		8
NPT 1/4" female	16		9
G 1/4" female for compression fittings	17		12

M-Flow 35 straight valve



Gas distribution system / V-Stack





Type code Q-Flow

Instrument type	Q-Flow	F	L	Q																
Instrument size	55									A										
	80									B										
	140									C										
Materials (body, seals)	Aluminium/brass, FKM									S										
	Stainless steel, FKM									E										
	Stainless steel, EPDM									T										
	Customer-specific / OEM									K										
Setup	Setup S**									S										
	Customer-specific / OEM									K										
Valve (position)	Valve at the inlet**									S										
	Valve at the outlet									A										
	Without valve									O										
	Customer-specific / OEM									K										
Process connection (in- and outlet)	G 1/4" female**															S				
	G 1/8" female															B				
	G 1/4" female (for compression fittings)															C				
	NPT 1/4" female															D				
	Customer-specific / OEM															K				
Measuring tube scale	Millimetric-scale																		M	
	Direct reading scale																		D	
	Customer-specific / OEM																		K	
Options	Additional flow table for mm-scale																			T
	Calibration report																			P
	Panel mounting kit																			E
	Locking ring (for standard-knob)																			A
	Locking nut (instead of standard-knob)																			B
	Hose connectors PVC, G 1/4" / 4mm																			N
	Hose connectors PVC, G 1/4" / 6mm																			O
	Hose connectors PVC, G 1/4" / 8mm																			Q
	Customized measuring tube scale																			M
	Customer-specific / OEM																			K
Type code		F	L	Q	-											-				-

* Standard

V
100

Type code V-100

Instrument type	V-100	F	L	V																
Instrument size	55								A											
	80								B											
	140								C											
Materials (body, seals)	Aluminium/brass, FKM								S											
	Stainless steel, FKM								E											
	Stainless steel, EPDM								T											
	Stainless steel, FFKM								W											
	Customer-specific / OEM								K											
Setup	Setup S**								S											
	Setup L								L											
	Setup R								R											
	Setup A (stainless steel only)								A											
	Setup T (stainless steel only)								T											
	Setup O (stainless steel only)								O											
	Customer-specific / OEM								K											
Valve (position)	Valve at the inlet**								S											
	Valve at the outlet								A											
	Without valve								O											
	Customer-specific / OEM								K											
Process connection (in- and outlet)	G 1/4" female**																S			
	G 1/8" female																B			
	G 1/4" female (for compression fittings)																C			
	NPT 1/4" female																D			
	Customer-specific / OEM																K			
Measuring tube scale	Millimetric-scale																	M		
	Direct reading scale																	D		
	Customer-specific / OEM																	K		
Options	Additional flow table for mm-scale																			T
	Calibration report																			P
	Laboratory base																			F
	Back cover, plexiglass, milky																			R
	Min. limit switch																			G
	Max. limit switch																			I
	Relays 24 Vdc for limit switch																			J
	Relays 230 Vac for limit switch																			H
	Hose connectors PVC, G 1/4" / 4mm																			N
	Hose connectors PVC, G 1/4" / 6mm																			O
	Hose connectors PVC, G 1/4" / 8mm																			Q
	Customized measuring tube scale																			M
	Customer-specific / OEM																			K
Type code		F	L	V	-												-			-

**Standard

Type code M-Flow

Instrument type	M-Flow	F	L	M																
Instrument size	25									A										
	35									B										
	V-Stack									C										
Materials (body, seals)	Aluminium/brass, FKM									S										
	Stainless steel, FKM									E										
	Stainless steel, EPDM									T										
	Stainless steel, FFKM									W										
	Customer-specific / OEM									K										
Setup	Straight valve**									S										
	Corner valve									E										
	Valve insert without body									O										
	V-Stack, 1 valve/outlet									B										
	V-Stack, 2 valves/outlets									C										
	V-Stack, 3 valves/outlets									D										
	V-Stack, 4 valves/outlets									F										
	V-Stack, 5 valves/outlets									G										
	V-Stack, 6 valves/outlets									H										
	V-Stack, 7 valves/outlets									I										
	V-Stack, 8 valves/outlets									J										
	V-Stack, 9 valves/outlets									M										
	V-Stack, 10 valves/outlets									N										
	V-Stack, 11 valves/outlets									P										
	V-Stack, 12 valves/outlets									Q										
	Customer-specific / OEM									K										
Valve (rolling direction)	Valve cw-closed**									S										
	Valve ccw-closed									L										
	Customer-specific / OEM									K										
Process connection (in- and outlet)	G 1/4" female** (Type 25)															S				
	G 1/8" female (Type 25)															B				
	G 1/4" female, compression fittings (Type 25)															C				
	NPT 1/4" female (Type 25)															D				
	G 1/2" female (Type 35)															S				
	Inlet: G 1", Outlet: G 1/2" (Type V-Stack)															S				
	Customer-specific / OEM															K				
Valve size	NS 1.0 (Type 25)																			A
	NS 1.5 (Type 25)																			B
	NS 2.0 (Type 25)																			C
	NS 2.5 (Type 25)																			D
	NS 3.0 (Type 25)																			E
	NS 4.0 (Type 35 / V-Stack)																			F
	NS 6.5 (Type 35 / V-Stack)																			G
	Customer-specific / OEM																			K

Contamination declaration

With return of devices, please fill out the following statement completely, especially the reason for the return, the type of residue and cleaning in the case of soiling, as well as indication of hazards.

Device:

Type code: _____

Serial number: _____

Reason for return:

Type of contamination

Device came in contact with: _____

Cleaned by us with: _____

Can you provide further information on the contamination?

- inert (no danger)
- corrosive
- caustic
- must not come in contact with moisture
- oxidizing
- other hazards:

For the protection of our employees and for general safety during transport, proper cleaning and the use of appropriate packaging are mandatory.

Legal declaration

We hereby confirm the correctness and completeness of the above information:

Company: _____

Address: _____

Phone: _____

Contact person: _____

Date: _____

Signature: _____

Change log

Date	Version	Replaces	Author	Note
01.03.2010	vflow_E4_3	vflow_E4_2	MHU	Page 21 / New Article Code
17.01.2011	vflow_E4_4	vflow_E4_3	MHU	Page 12, 21, 29, 30, 31, 32: Translation of marking Page 9, 10: Material of limit stop added
07.05.2012	vflow_E4_5	vflow_E4_4	LEU	Page 18 / Sealing Material
02.04.2014	vflow_E4_6	vflow_E4_5	LEU	Page 31 / Drawing
22.04.2014	vflow_E4_7	vflow_E4_6	LEU	Page 11 / Drawing