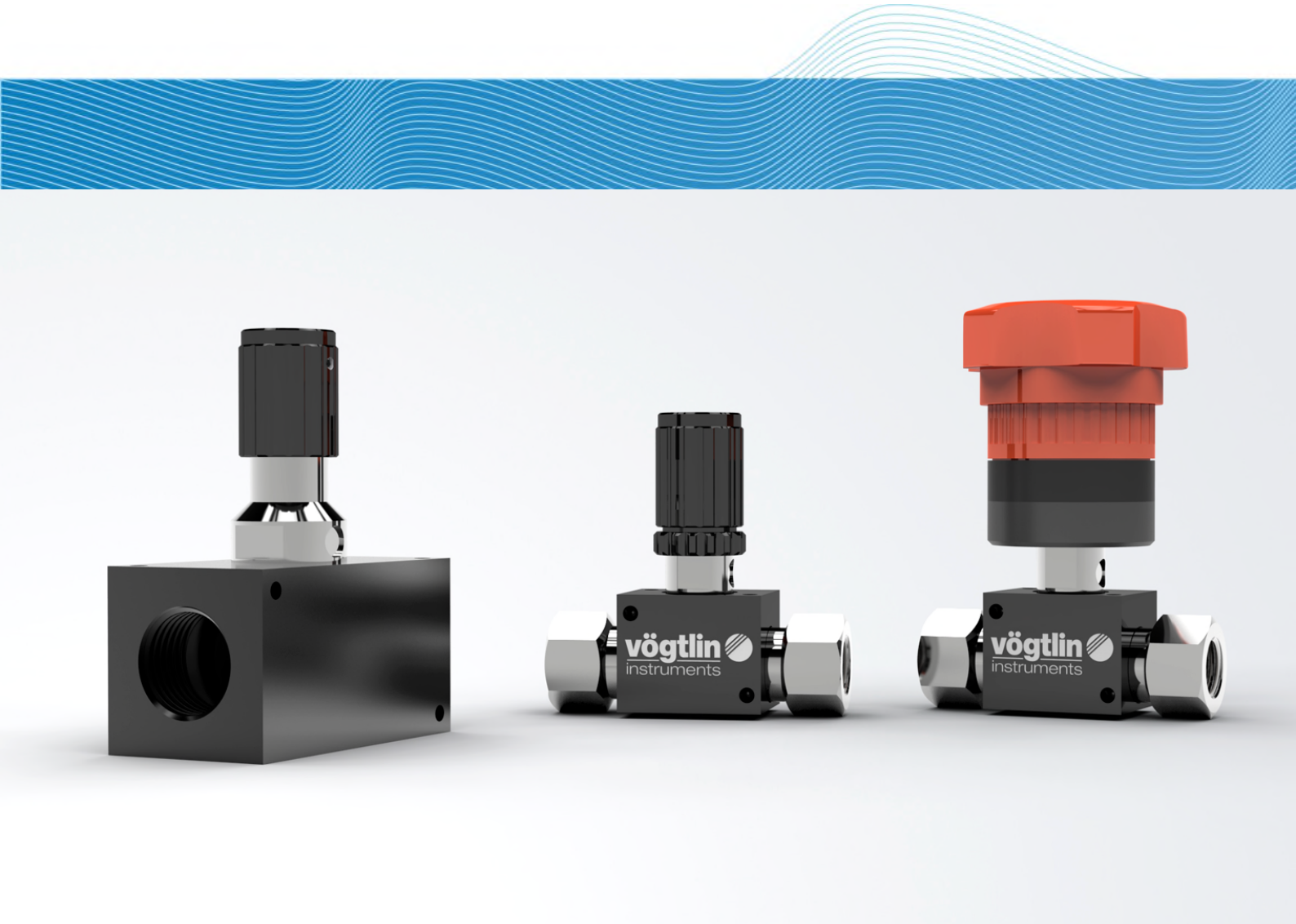

Instruction Manual
Precision Control Valves M-Flow

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vögtlin instruments

Original Instruction Manual
Precision Control Valves M-Flow

CE

Version: **mflow_D5_0**

Current information on our products can be found on the Internet at www.voegtlin.com

Index

High-precision control valve

We are glad that you have decided to use our 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.

Product description and intended use

The precision control valves are purely mechanical and are used to adjust flow and shut off. Some applications:

- Setting a leakage during pressure control
- Throttling of the flow rate so that a pressure can be regulated slowly
- Inerting in various processes (displacement of oxygen)
- Oxygen input from fish transport container

Intended use

The operator of the system is responsible for the safe operation of the control valves and takes precautions to avoid consequential damage in the event of a device defect (leakage). In particular, only materials which are resistant to the gas used may be used for corrosive gases. (See also notes on "corrosive gases" and " predictable risks).

Safety Instructions

Improper handling can cause the control valve to leak and gas to enter the environment. In the event of a leakage, the escaping gas can cause damage to the environment and/or personal injury.

Copyright and privacy policy

We have prepared this operating manual with all due care. However, no responsibility is taken for the correctness, completeness and topicality of the contents.

This document is subject to copyright. Processing, in particular translation into another language, as well as distribution require the written consent of the manufacturer.

Data transmission via computer networks may be subject to security gaps. A complete protection of the data against access by third parties is therefore not possible.

Disclaimer

The manufacturer is not liable for any damages whatsoever resulting from the use of this product. The operator is responsible for the correct installation, commissioning and safe operation of this product.

These products are warranted according to the current product information and the manufacturer's terms of sale and delivery.

The manufacturer reserves the right to change the contents of the documents, including this disclaimer, in any way and without notice. The manufacturer is not liable in any way for any consequences of such changes.

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 operating limits
- Damage caused by pressure surges (see also " predictable risks)
- Corrosion damage caused by operation with gases which were not intended for this purpose at the origin, as well as by external influences.
- Mechanical damage in general

Herstellererklärung
Manufacturers Declaration

Bestätigung der Übereinstimmung
mit den Anforderungen der europäischen
Druckgeräterichtlinie 97/23/EG

confirming the correspondence with the
requirements of the European Directive
for pressure equipment 97/23/EC

Vögtlin Instruments GmbH

erklärt, in alleiniger Verantwortung, dass
die Produkte

declare on their own responsibility that
the products

FLQ-*
FLV-*
FLM-*

FLQ-*
FLV-*
FLM-*

*) etwaige Ausführungen

Q-Flow Schwebekörper Durchflussmesser
F-Flow Schwebekörper Durchflussmesser
M-Flow Präzisions-Regelventile

*) various versions

Q-Flow variable area flowmeters
F-Flow variable area flowmeters
M-Flow precision control valves

mit den Bestimmungen der Druckgeräterichtlinie
97/23/EG übereinstimmt.

Corresponds to the Pressure Equipment
Directive 97/23/EC.

Angewandte Konformitätsbewertungsverfahren:

Gute Ingenieur Praxis

Applied conformity assessment procedures:

Good engineering practice

Es darf kein CE-Kennzeichen angebracht werden, siehe Artikel 3 Abs. 3 der Richtlinie 97/23/EG.

In acc.with Article 3 Paragraph (3) of the PED 97/23/EC the CE mark is not shown.

Aesch, 29.04.2016

Geschäftsführer/President
F. Waltz

Qualitätssicherung
J.-P. Alder

Predictable risks

Before commissioning the system, the operator must take appropriate precautions to ensure that the environment and/or persons are protected in the event of a fault.

Leakage of the control valves can result in the following risks:

- Escaping gas can be suffocating, toxic and/or corrosive. Please read the safety data sheet of the used gas or gas mixture from the respective gas supplier carefully beforehand.
- When flammable gases escape, an explosive gas mixture can form in the environment.
- In the case of aggressive media, leakage can lead to corrosion damage to the device and/or in the immediate vicinity.

The following causes can lead to gas leakage:

- The valve becomes leaky because it is operated with a gas which was not intended for this purpose at the origin. As a result, gas may leak if the seals are not resistant to this gas.
- The process connections are not tight due to improper installation. A leak test must be carried out before commissioning.

The possible causes of gas leakage are not conclusive and may have other causes as well.

Corrosive Gases

The operator is solely responsible for the safe operation of the system and takes precautions to protect the environment and/or persons in the event of leaks.
The valve may only be operated with the gases for which the valve has been designed and specified.

Sealing materials for corrosive gases

The manufacturer shall propose the sealing material suitable for the specified gas. The data on resistance are taken from the literature of our suppliers. Therefore, we cannot guarantee the specified sealing material.

Operation with ozone gas (O3)

The durability of the sealing material depends strongly on the operating conditions.
In ozone applications, concentration, humidity and temperature have a decisive influence on the resistance of the sealing material used.
Vögtlin Instruments only supplies a device for O3 if the customer/plant operator himself determines the sealing material.
The same applies to unknown media and gas mixtures.

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 M-Flow

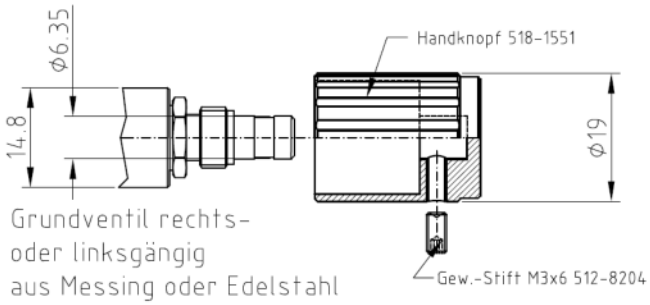
Betreff	M-Flow 25	M-Flow 35
Straight valve	●	●
Valve insert / Cartridge	●	●
Valve rotations	15	15
Valve size	NS 1.0 bis 3.0	NS 4 und 6.5
Leak rate	$<1x10^{-5}$ mbar l/s He	$<1x10^{-5}$ mbar l/s He
Pressure resistance	20 bar	20 bar
Minimum temperature	0°C	0°C
Maximum temperature	100°C	100°C
Connecting threads	G ¼“	G ½“

Wetted Materials M-Flow

Component	Materials
Valve Body	Anodized Aluminium, optional Stainless Steel 1.4305 (AISI 303)
Valve insert/cartdrige	Nickel-plated brass, optional Stainless Steel 1.4305 (AISI 303)
Connections	Stainless Steel 1.4305 (AISI 303)
Seals	FKM, optional EPDM or FFKM

Version M-Flow

Standard knob

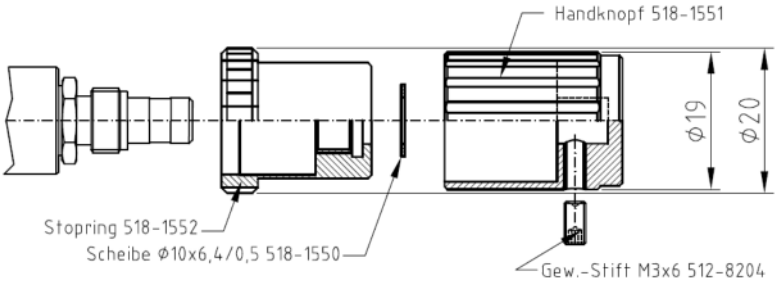


Straight valve G ¼"

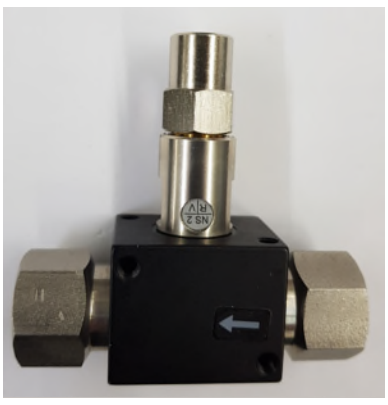
Valve cartridge (valve core)

Can be ordered as spare part

Standard knob with locking ring

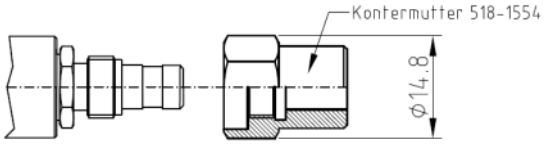


Hexagon socket with lock nut (instead of rotary knob)



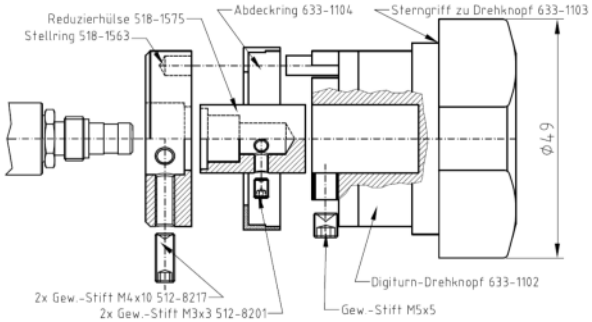
Hexagon socket 3 mm

SW 13 mm



M-Flow types

Digiturn with display (100 graduation, clockwise closing)



Installation and commissioning

Installation instructions

- The control valve may only be installed and commissioned by qualified personnel.
- The pipeline must be free of particles before installing the control valve. Please flush them before installing the valve in the pipeline.
- 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

Note when operating with flammable or toxic gases

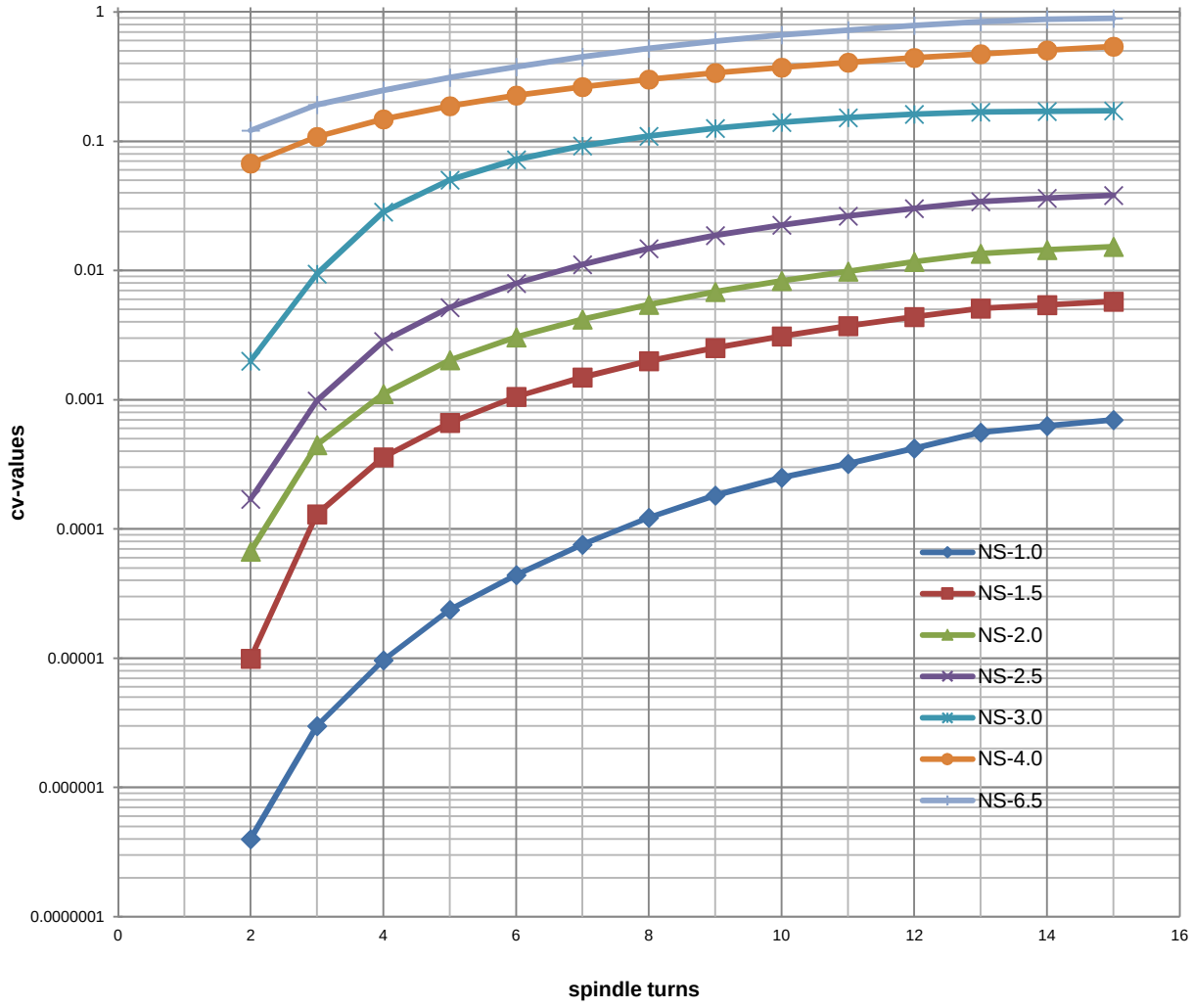
- When closed the control valve closes thigtly with an O-ring. For flammable and/or toxic gases, we recommend the use of an additional shut-off device.

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*)

C_V-values high-precision control valves M-Flow

C_V-values valves NS1.0 to NS6.5



Opening point:

To ensure that the control valve closes tightly, an O-ring is used to seal the valve seat. A flow therefore only occurs after about 2 turns.

C_V-value 1 = 1 m^3/h water at Δp of 1bar

Disassembly and maintenance

Important notes on disassembly from the system

- Please close the gas supply, flush the pipes and then close the shut-off valves. Make sure that the line is depressurized and that no dangerous gas can enter the environment. You can then start disassembling the control valve. Only use suitable tools for this purpose. The removal and installation of the valves may only be carried out by qualified personnel.

Maintenance

When used correctly, variable area flow meters from Vögtlin Instruments GmbH 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

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

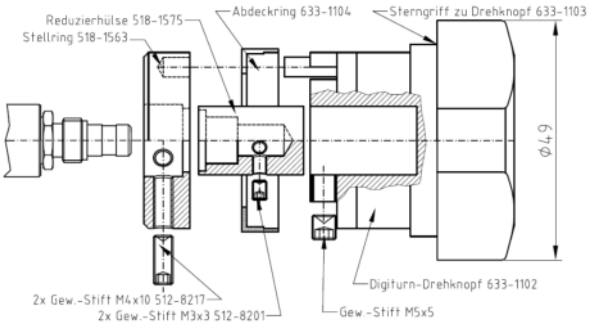
When returning, please use the original packaging if possible or suitable alternative packaging. We do not accept responsibility for damage in transit. Please inform us of the reason for return: this enables us to process your request quickly.

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.

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 dismounted from the valve



Recommended connections

We recommend that you only use process connections that seal with an O-ring or a suitable sealing ring. For example:

Compression fitting for metal pipes

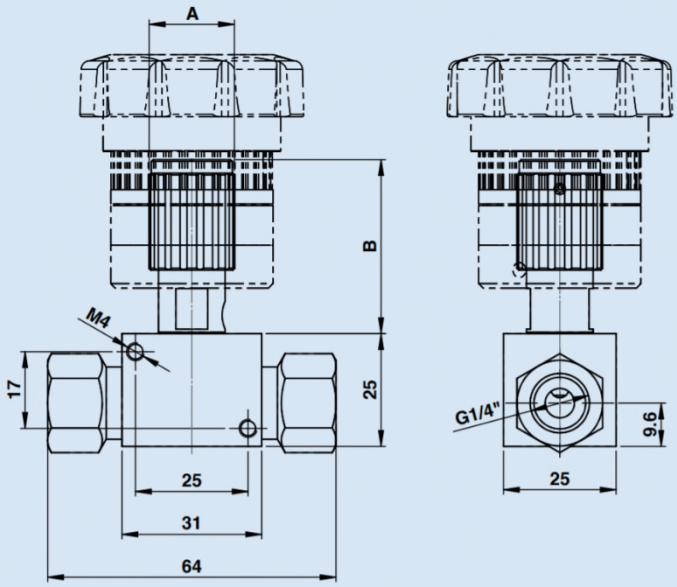
Hose nozzles for soft hose

Push-in connectors for PUR hose

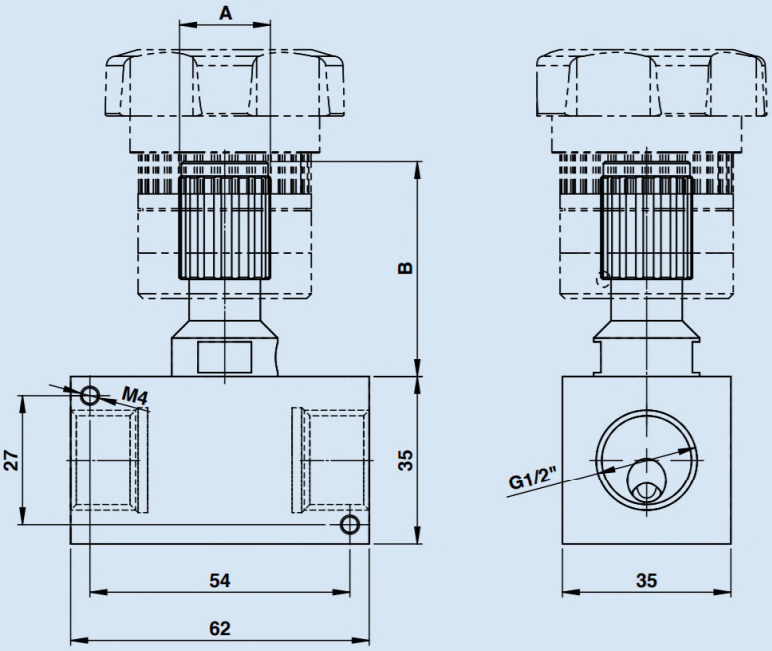
Appendix

Dimensions high-precision control valves M-Flow

M-Flow 25 (G1/4")



M-Flow 35 (G1/2")



Dimensions rotary knob (mm)	M-Flow 25 (G1/4")		M-Flow 35 (G1/2")	
	A	B	A	B
Standard knob	ø19	39	ø19	45
Standard knob with locking ring	ø20	39	ø20	45
Digiturn with display, 100 division	ø50	62	ø50	68
Hexagon socket locking nut (instead of standard knob)	ø15	37	ø15	43

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:	
Adress:	
Phone:	
Contact person:	
Date:	
Signature:	

Change log

Date	Version	Replaces	Author	Note
01.03.2010	vflow_D4_3	vflow_D4_2	MHU	Page 21 / New Article Code
17.01.2011	vflow_D4_4	vflow_D4_3	MHU	Page 9, 10: Material of limit stop added
07.05.2012	vflow_D4_5	vflow_D4_4	LEU	Page 18 / Sealing Material
02.04.2014	vflow_D4_6	vflow_D4_5	LEU	Page 31 / Drawing
22.04.2014	vflow_D4_7	vflow_D4_6	LEU	Page 11 / Drawing
27.06.2019	mflow_D4_8	Vflow_D4_7	JER	General adaptions according to „Retrofit”
08.07.2019	mflow_D4_9	mflow_D4_8	MHU	Layout
15.10.2019	mflow_D5_0	mflow_D4_9	FLU	Layout, general adaptions