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Operating instructions

Filter module VMF
Measuring orifice VMO
Fine-adjusting valve VMV

Contents

Safety

Please read and keep in a safe place

Please read through these instructions carefully before installing or operating. Following the installation, pass the instructions on to the operator. This unit must be installed and commissioned in accordance with the regulations and standards in force. These instructions can also be found at www.docuthek.com.

Explanation of symbols

•, **1**, **2**, **3** ... = Action
▷ = Instruction

Liability

We will not be held liable for damage resulting from non-observance of the instructions and non-compliant use.

Safety instructions

Information that is relevant for safety is indicated in the instructions as follows:

⚠ DANGER
Indicates potentially fatal situations.

⚠ WARNING
Indicates possible danger to life and limb.

! CAUTION
Indicates possible material damage.

All interventions may only be carried out by qualified gas technicians. Electrical interventions may only be carried out by qualified electricians.

Conversion, spare parts

All technical changes are prohibited. Only use OEM spare parts.

Changes to edition 01.18

The following chapters have been changed:
– Tightness test
– Accessories

Checking the usage

Intended use

valVario filter module VMF, measuring orifice VMO and fine-adjusting valve VMV for installation in gas control and safety systems in the fields of industrial and commercial gas heat generation.

VMF: with replaceable filter pad insert to protect against soiling of downstream appliances.

VMO: with replaceable orifice insert. For use as a restricting or measuring orifice.

VMV: fine-adjusting valve for presetting the gas or air flow rate to gas burners or gas appliances.

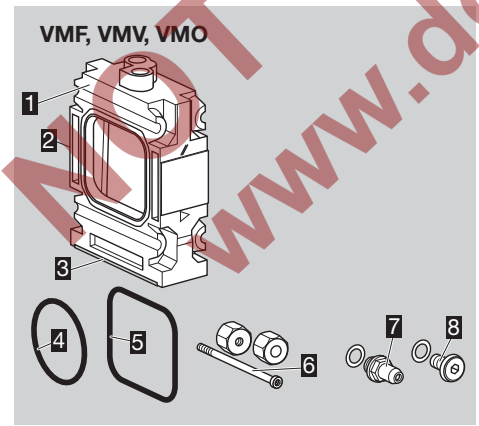
This function is only guaranteed when used within the specified fields of application, see also page 7 (Technical data).

Any other use is considered as non-compliant.

Type code

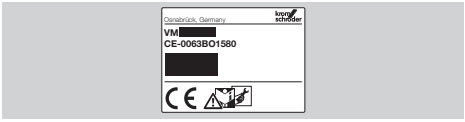
Code	Description
VMF	valVario filter module
VMO	valVario measuring orifice
VMV	valVario fine-adjusting valve
1–3	Size
–	No inlet and outlet flange
10–65	Nominal inlet diameter DN
/10–/65	Nominal outlet diameter DN
R	Rp internal thread
N	NPT internal thread
F	Flange to ISO 7005
05	p_u max. 500 mbar
M	With test points
P	With screw plugs
xx	Orifice diameter

Part designations



1 Housing
2 Type label
3 Base plate
4 O-ring
5 Double block seal
6 Connection parts (2 ×)
7 Pressure test point
8 Sealing plug

Inlet pressure p_u and ambient temperature: see type label.



Installation

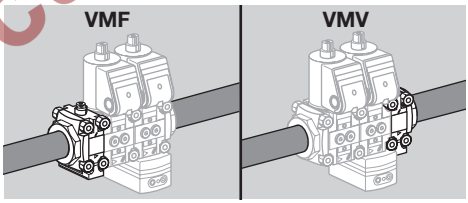
! CAUTION

Please observe the following to ensure that the unit is not damaged during installation and operation:

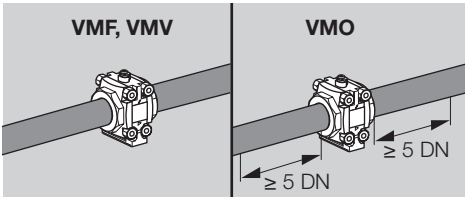
– Dropping the device can cause permanent damage. In this event, replace the entire device and associated modules before use.

▷ Installation position: install the VMF with the base plate pointing downwards or sideways, otherwise dirt can collect in the housing when replacing the filter pad. The VMV can be installed as required; when fitting to pressure regulator VAD, VAG or VAV, the base plate must be facing the same direction as the regulator body. VMO can be installed as required.

▷ Installation position when using valVario controls: VMF is fitted upstream of the control, VMV is fitted downstream of the control. When used as a restricting orifice, the VMO is fitted downstream of the control.



▷ Installation position with inlet and outlet flanges: VMF, VMV and VMO may be inserted at any position in the pipework. When used as a measuring orifice, the length of the inlet and outlet section of the VMO must be ≥ 5 DN.



▷ The housing must not touch any surrounding walls. Minimum clearance 20 mm.

▷ Sealing material and thread cuttings must not be allowed to get into the housing.

▷ A filter must be installed upstream of every system.

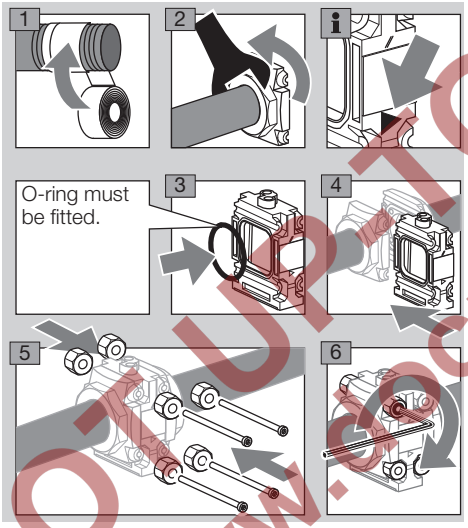
▷ Ensure that there is sufficient space for installation and adjustment.
▷ Do not store or install the unit in the open air.

! CAUTION

Please observe the following to ensure that the VMF, VMO or VMV is not damaged during operation:
– Only secure the appliance by holding the octagon on the flange with a suitable spanner – risk of external leakage.

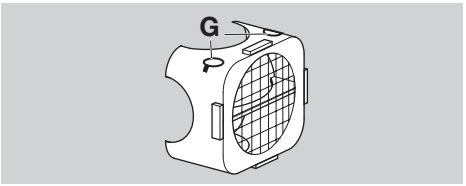
⚠ WARNING

If VMF, VMO or VMV has been delivered with two flanges and is subsequently attached to a valVario control, use the double block seal instead of the O-ring. The double block seal must be ordered separately, see page 5 (Accessories).



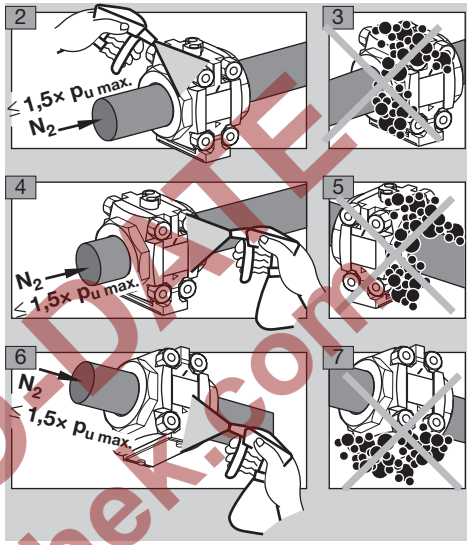
VMV

▷ If the fine-adjusting valve VMV is fitted downstream of a pressure regulator VAD, VAG or VAV, a differential pressure orifice with rubber seals **G** must be inserted at the outlet of the pressure regulator.



Tightness test

1 To be able to check the tightness, shut off the downstream pipeline as close as possible to the VMF, VMV or VMO.



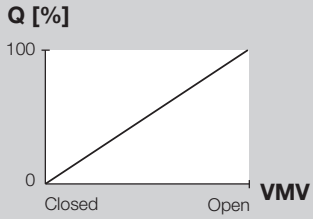
8 Tightness OK: open the pipeline.
▷ Pipeline leaking: check O-rings. When installing on a valVario valve or pressure regulator, check the O-ring and, if fitted, the double block seal.
▷ Unit leaking: dismantle the VMF, VMO or VMV and return it to the manufacturer.

Commissioning

VMV

Setting the flow rate

▷ At the factory, the fine-adjusting valve VMV is adjusted for maximum flow rate (100%).



! CAUTION

Do not overturn the adjusting screw, as the fine-adjusting valve then can no longer be adjusted.

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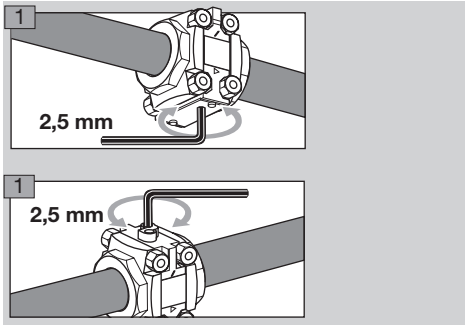


GB

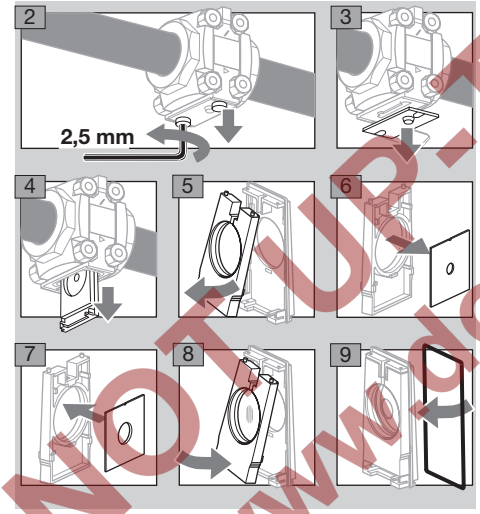
2 Check the VMV for leaks – see page 3 (Tightness test).

VMO

Replacing the orifice plate

▷ Orifice plates and flow rate diagrams – see page 5 (Orifice plate)

1 Shut off the gas supply.



10 O-ring/sealing ring may be greased lightly, e.g. with Klüber Nontrop ZB91.

11 Follow the reverse procedure when reassembling.

12 Check the VMO for tightness – see page 3 (Tightness test).

Maintenance

! CAUTION

In order to ensure smooth operation: check the VM for tightness annually, or every six months if operated with biogas.

VMF

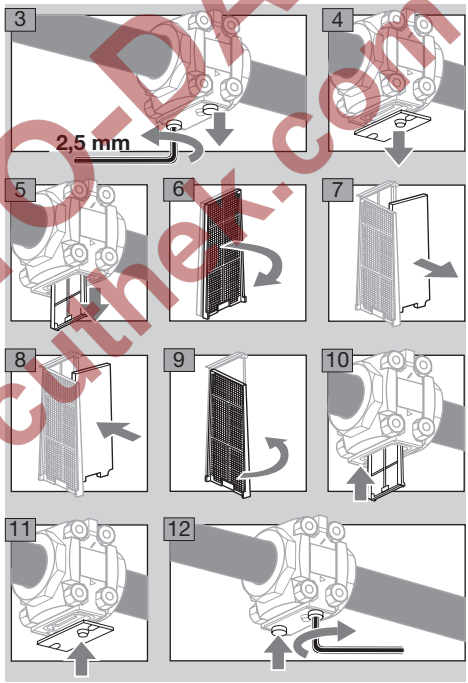
Replacing the filter pad

▷ If the flow rate is correct, check for tightness – see page 3 (Tightness test).

▷ If the flow rate has dropped, replace the filter pad.

1 Disconnect the system from the electrical power supply.

2 Shut off the gas supply.

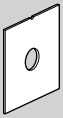


13 Check the VMF for tightness – see page 3 (Tightness test).

Accessories

Orifice plate

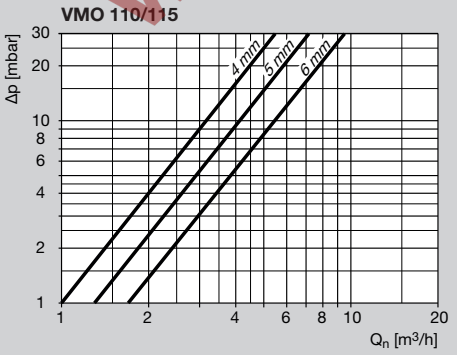
Orifice insert for installing in the plate bracket of measuring orifice VMO. The hole diameter is engraved on the orifice insert. Supply including the new seal for the base plate.

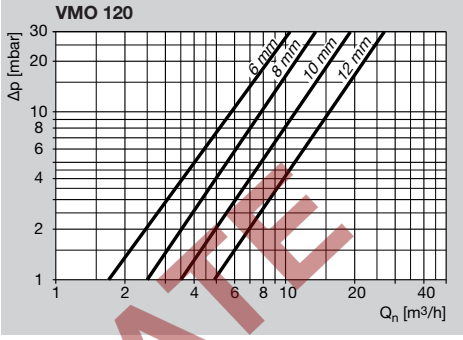


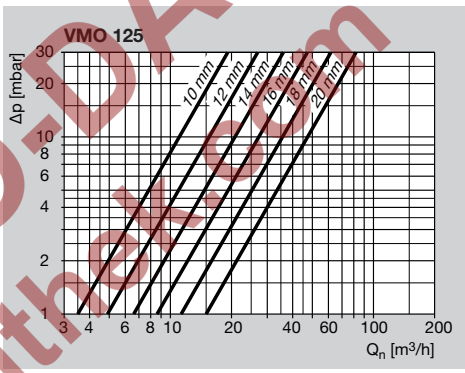
Orifice	Hole diameter [mm]	Order No.
VMO1 D4 /B	4	74923803
VMO1 D5 /B	5	74923804
VMO1 D6 /B	6	74923805
VMO1 D8 /B	8	74923806
VMO1 D10 /B	10	74923807
VMO1 D12 /B	12	74923808
VMO1 D14 /B	14	74923809
VMO1 D16 /B	16	74923810
VMO1 D18 /B	18	74923811
VMO1 D20 /B	20	74923812
VMO1 Dx /B*	xx*	74923813
VMO2 D16 /B	16	74923814
VMO2 D20 /B	20	74923815
VMO2 D24 /B	24	74923816
VMO2 D28 /B	28	74923817
VMO2 D32 /B	32	74923818
VMO2 D34 /B	34	74923819
VMO2 D38 /B	38	74923820
VMO2 Dx /B	xx*	74923821
VMO3 D38 /B	38	74926017
VMO3 D42 /B	42	74926018
VMO3 D46 /B	46	74926019
VMO3 D50 /B	50	74926020
VMO3 D54 /B	54	74926021
VMO3 Dx /B	xx*	74926022

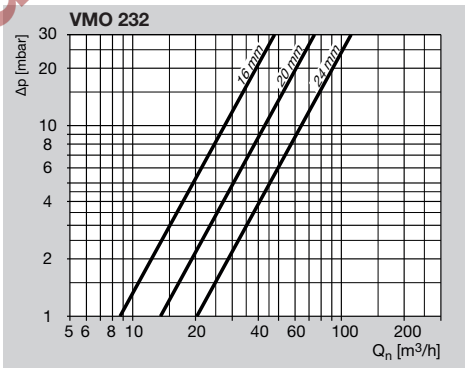
* Hole diameter on request.

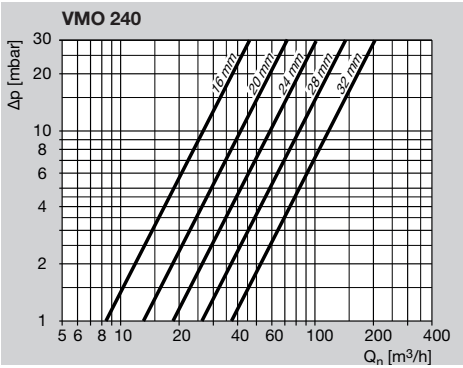
▷ Flow rate diagrams for orifice plates with a hole diameter of 4 to 54 mm for operation with natural gas. Pressure loss is measured at the VMO pressure taps:











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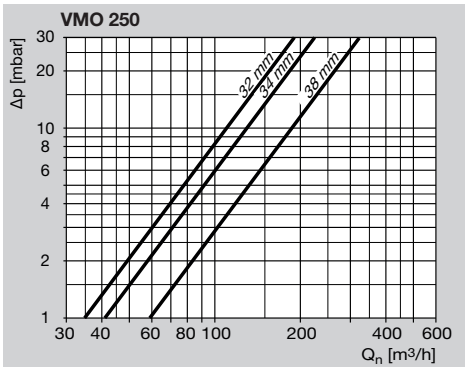
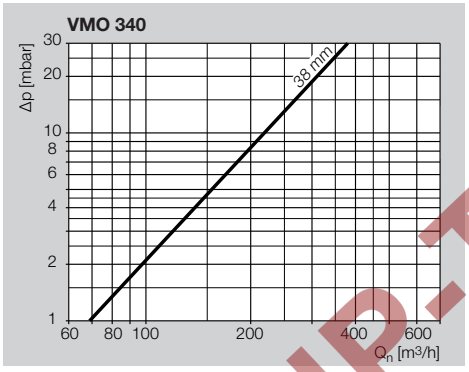
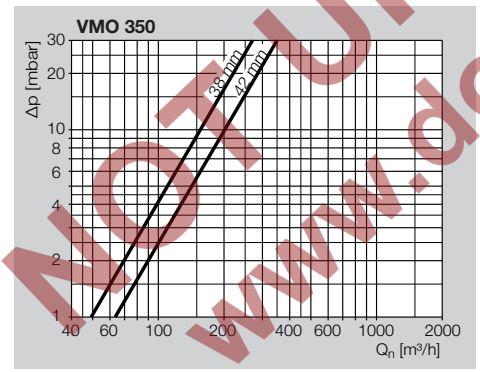
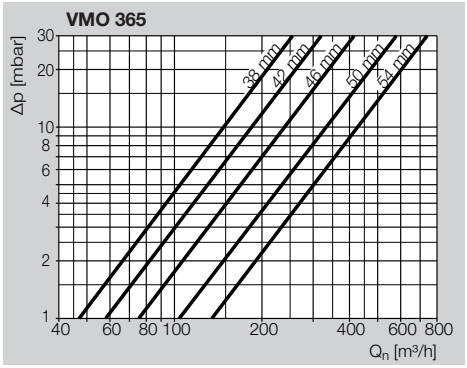


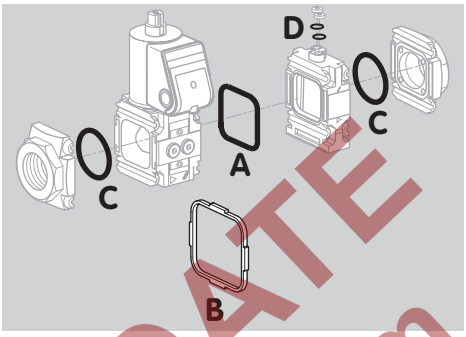






Seal set VA 1 – 3

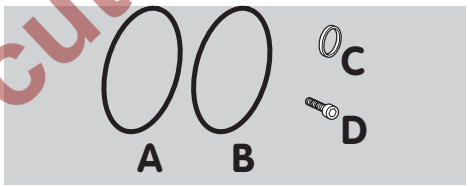
When retrofitting accessories or a second valVario control, we recommend replacing the seals.



Seal set for size 1: Order No. 74921988
Seal set for size 2: Order No. 74921989
Seal set for size 3: Order No. 74921990
Scope of delivery:

A 1 x double block seal ,
B 1 x retaining frame (the retaining frame is not required for attachment of VMx),
C 2 x O-rings (flange),
for test point/screw plug:
D 2 x sealing rings (flat sealing),
2 x profiled sealing rings.

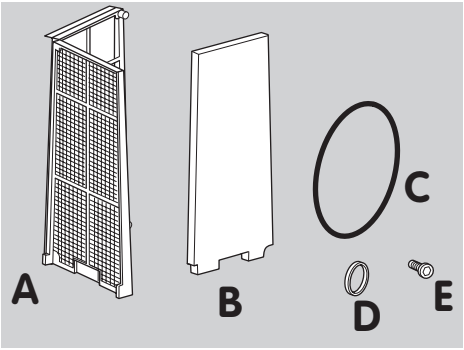
Seal set VMO/VMV



Seal set VMO/VMV 1 /B: Order No. 74924936
Seal set VMO/VMV 2 /B: Order No. 74924937
Seal set VMO/VMV 3 /B: Order No. 74926024
Scope of delivery:

A 1 x O-ring (base plate),
B 1 x O-ring (restrictor insert),
C 2 x profiled sealing rings,
D 2 x or 4 x set screws.

Filter pad set



Filter pad set for size 1:
Order No. 74923800
Filter pad set for size 2:
Order No. 74923801
Filter pad set for size 3:
Order No. 74926023
Scope of delivery:

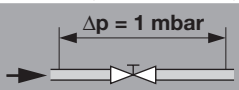
A 1 x retaining frame with strainer,
B 10 x filter pads,
C 10 x seals for the base plate,
D 2 x seals for 1/8" test points,
E 2 x screws for securing the base plate,
4 x screws for securing the base plate on size 3 filter modules.

Technical data

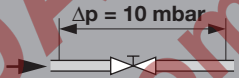
- ▷ Gas types: natural gas, LPG (gaseous), biogas (max. 0.1 %-by-vol. H_2S) or air; other gases on request.
- ▷ The gas must be dry in all conditions and must not contain condensate.
- ▷ Max. inlet pressure p_u: max. 500 mbar (7.25 psig).
- ▷ Medium and ambient temperatures: -10 to +60°C, no condensation permitted. Long-term use in the upper ambient temperature range accelerates the ageing of the elastomer materials and reduces the service life (please contact manufacturer).
- ▷ Storage temperature: -20 to +40°C.
- ▷ Housing: aluminium.
- ▷ Connection flanges with internal thread: Rp to ISO 7-1, NPT to ANSI/ASME.

VMV

▷ Air flow rate Q for pressure loss Δp:



	Q min. [m³/h]	Q max. [m³/h]
VMV 110	0.2	9.1
VMV 115	0.2	12.5
VMV 120, VMV 125	0.2	19.4
VMV 225	0.6	36.1
VMV 232 – VMV 250	0.6	51.4
VMV 340	0.3	68.0
VMV 350	0.3	60.1
VMV 365	0.3	64.8



	Q min. [m³/h]	Q max. [m³/h]
VMV 110	0.4	22.9
VMV 115	0.4	31.4
VMV 120, VMV 125	0.4	48.8
VMV 225	1.5	91
VMV 232 – VMV 250	1.5	129.6
VMV 340	0.3	68.0
VMV 350	0.3	60.1
VMV 365	0.3	64.8

VMF

▷ Air flow rate Q for pressure loss Δp:

	Air flow rate Q [m³/h] for	
	Δp = 1 mbar.	Δp = 10 mbar
VMF 110	4.9	15.5
VMF 115	7.0	22.1
VMF 120	13.0	41.2
VMF 125	16.0	50.7
VMF 225	23.2	73.5
VMF 232	31.9	101.0
VMF 240	38.3	121.0
VMF 250	41.1	130
VMF 340	61.0	194.0
VMF 350	64.0	203.0
VMF 365	68.0	218.0

Designed lifetime

This information on the designed lifetime is based on using the product in accordance with these operating instructions. Once the designed lifetime has been reached, safety-relevant products must be replaced. Designed lifetime (based on date of manufacture) in accordance with EN 13611 and EN 161 for VM 1 to VM 2: 10 years.

You can find further explanations in the applicable rules and regulations and on the afecor website (www.afecor.org).

This procedure applies to heating systems. For thermoprocessing equipment, observe local regulations.

Logistics

Transport
Protect the unit from external forces (blows, shocks, vibration). On receipt of the product, check that the delivery is complete (see page 2 (Part designations)). Report any transport damage immediately.

Storage
Store the product in a dry and clean place.
Storage temperature: see page 7 (Technical data).
Storage time: 6 months in the original packaging before using for the first time. If stored for longer than this, the overall service life will be reduced by the corresponding amount of extra storage time.

Packaging
The packaging material is to be disposed of in accordance with local regulations.

Disposal
Components are to be disposed of separately in accordance with local regulations.

Certification

Declaration of conformity

CE

We, the manufacturer, hereby declare that the products VMF, VMO, VMV with product ID No. CE-0063BO1580 comply with the requirements of the listed Directives and Standards.
Directives:
– 2014/35/EU – LVD
– 2014/30/EU – EMC
Regulation:
– (EU) 2016/426 – GAR
Standards:
– EN 161
– EN 88
– EN 126
– EN 1854
The relevant product corresponds to the tested type sample.
The production is subject to the surveillance procedure pursuant to Regulation (EU) 2016/426 Annex III paragraph 3.
Elster GmbH

Scan of the Declaration of conformity (D, GB) – see www.docuthek.com

Eurasian Customs Union

EAC

The products VMF, VMO and VMV meet the technical specifications of the Eurasian Customs Union.

Contact

If you have any technical questions, please contact your local branch office/agent. The addresses are available on the Internet or from Elster GmbH.

We reserve the right to make technical modifications in the interests of progress.

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