MEDENUS

Gas Pressure Regulation

Gas Filter
DF 50

Product information

EN

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ATTENTION Observe the following publications in relation to installation, start-up and maintenance:
DVGW - work sheets G 491 and G 600
Operating and Maintenance Instructions DF50

List of abbreviations and formula symbols

AC	Accuracy class
AG_o	Upper response pressure group
AG_u	Lower response pressure group
BV	Breather valve
GPR	Gas pressure regulator
HDS	High-pressure spindle
K_G	Valve flow rate coefficient
p	Pressure
p_d	Outlet pressure
p_{df}	SRV closing pressure
p_{do}	SRV opening pressure
p_{ds}	Setpoint of the response pressure
$p_{ds\,o}$	Upper SSV response pressure
$p_{ds\,u}$	Lower SSV response pressure
$p_{f,max}$	Maximum closing pressure
PS	Maximum allowable pressure
p_u	Inlet pressure
Q_n	Standard volumetric flow rate
RE	Diaphragm assembly
RSD2	Throttle valve
SSV	Safety shut-off valve
SRV	Safety relief valve
SG	Closing pressure group
t_{Gas}	Gas inlet temperature
VS	Valve seat
w_d	Outlet gas velocity
w_u	Inlet gas velocity
$W_{ds\,o}$	Upper spring adjustment range (SSV)
$W_{ds\,u}$	Lower spring adjustment range (SSV)
Δp	Pressure difference from inlet pressure to outlet pressure
Δp_{wo}	Min. re-engagement difference between upper response pressure and normal operating pressure
Δp_{wu}	Min. re-engagement difference between lower response pressure and normal operating pressure
ρ_n	Gas density

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Application, characteristics, technical data

Application

Type DF 50 filters are intended to separate gas impurities such as dust, rust, and other solids in gas-carrying line at a defined point. They are mainly used in gas systems and in front of such devices whose function is impaired by contamination.
These filters can be used for gases according to DVGW worksheet G 260/G 262 and for neutral non-aggressive gases. (other gases on request)

Characteristics

- Easily replaceable filter cartridge
- High separation efficiency thanks to optimized flow guidance (30 µm standard, 5 µm optional)

Type of models / Options (see page 8)

- Black epoxy resin coating
- Biogas & coke oven gas version (maximum 0.1% H2S)
- Flange sets for screw-in threads Rp1“, Rp1.5“, Rp2“

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Technical data

Type

DF 50

Max. allowable pressure PS

6 bar Rp ½" / ¾ / 1" / 1¼" / 1½" / 2"
DN 40* / 50* / 65 / 80 / 100 / 125 / 150
2 bar DN 200 / 250 / 300

*) For screw-in units with flange set

Nominal width

Rp ½" / ¾ / 1" / 1½" / 2"
DN 40* / 50* / 65 / 80 / 100 / 125 / 150 / 200 / 250 / 300

Connection type

Gas thread ISO 7-1 from Rp½ to Rp2 or
ANSI-ASME B1.20 from ½"NPT to 2"NPT
Flange PN16 – ISO 7005 from DN65 to DN300

Material

Housing - Die-cast aluminum (up to DN100)
- Sand-cast aluminum (from DN125)

Filter - Non-woven polypropylene fibbers with metal supporting frame

Seals - NBR

Temperature range
(operating/ambient temperature)

-40°C / +80°C (-40°F to +176°F)

Filtering area

Rp ½" - 0.0055 m² Rp 2" - 0.0330 m²	Rp ¾" - 0.0055 m²	Rp 1" - 0.0145 m²
DN 65 - 0.0535 m² DN 80 - 0.0535 m² DN 100 - 0.0860 m²	DN 150 - 0.154 m² DN 200 - 0.276 m² DN 250 - 0.310 m²	DN 300 - 0.420 m²

Filtration efficiency

Particle size > 30 µm (5 µm optional), filter class G4 to EN 779

Function, strength, and tightness

DIN 3386, DVGW work sheet G 498 and DIN 30690-1

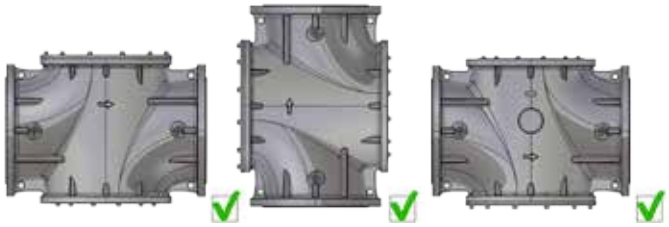
CE mark acc. to PED / PIN number

PED/0497/2875/14

Ex protection

The mechanical parts of the device do not have any potential ignition sources of their own and therefore do not fall within the scope of ATEX 95 (94/9/EC). Electrical components fitted to the device comply with the ATEX requirements.

Preferred installation position



The installation position of the gas filters is freely selectable

Note: Observe the following documents in relation to installation, start-up, and maintenance:

- DVGW - work sheets G 491 and G 600
- Operating and Maintenance Instructions DF50

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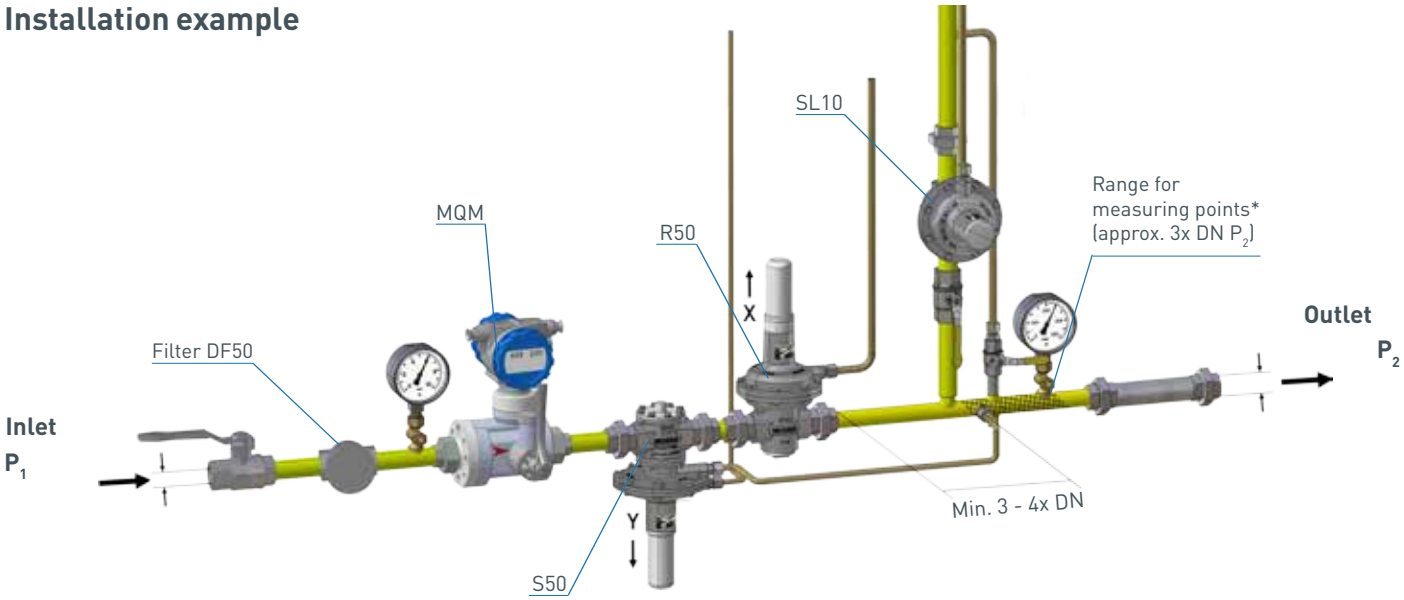
Structure and function

The gas flows through the inlet flange into the filter housing. The dust particles entrained in the gas are retained by the filter element. The cleaned gas flows off through the outlet flange.

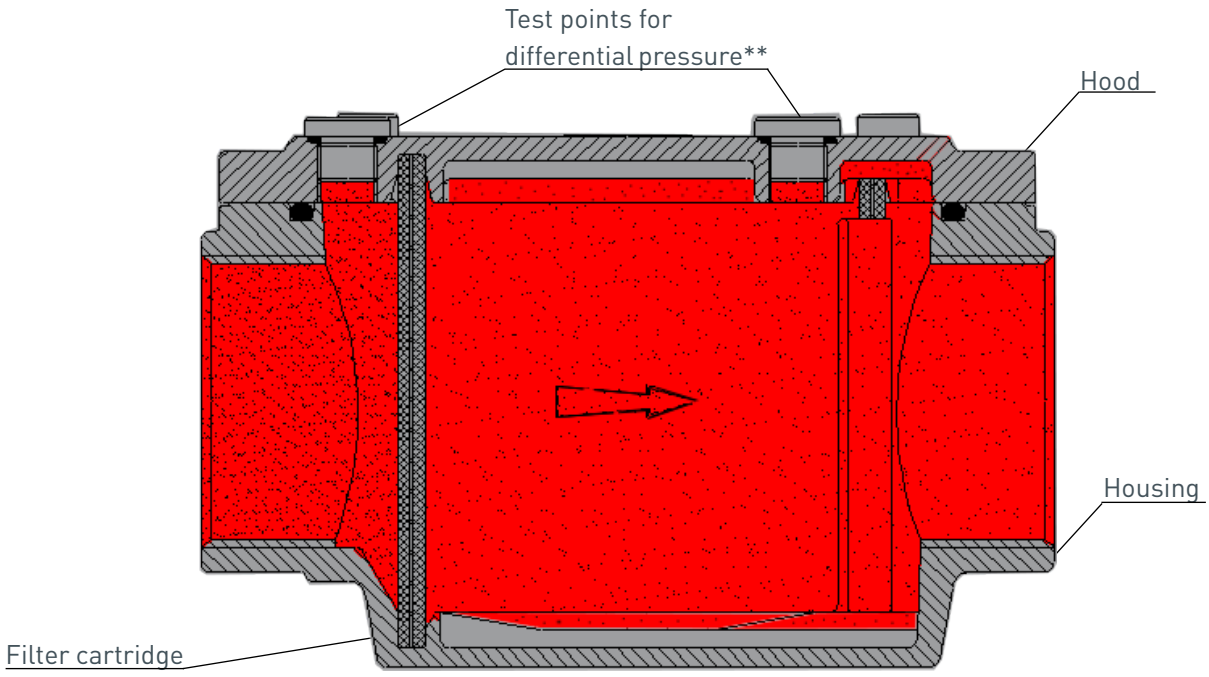
The filters mainly consist of the housing, the cover, and the filter cartridge. Taking off the cover for maintenance and replacement of the filter cartridge guarantees easy access. The filter cartridge is made of non-woven polypropylene fibers, is equipped with a metal support frame and is suitable for holding dust and other impurities with a size >= 30 µm (>=5 µm optional).

If the dust holding capacity is exceeded or there is an excessive pressure difference, the filter loses its protective function. In this case, the filter element must be replaced.

Installation example



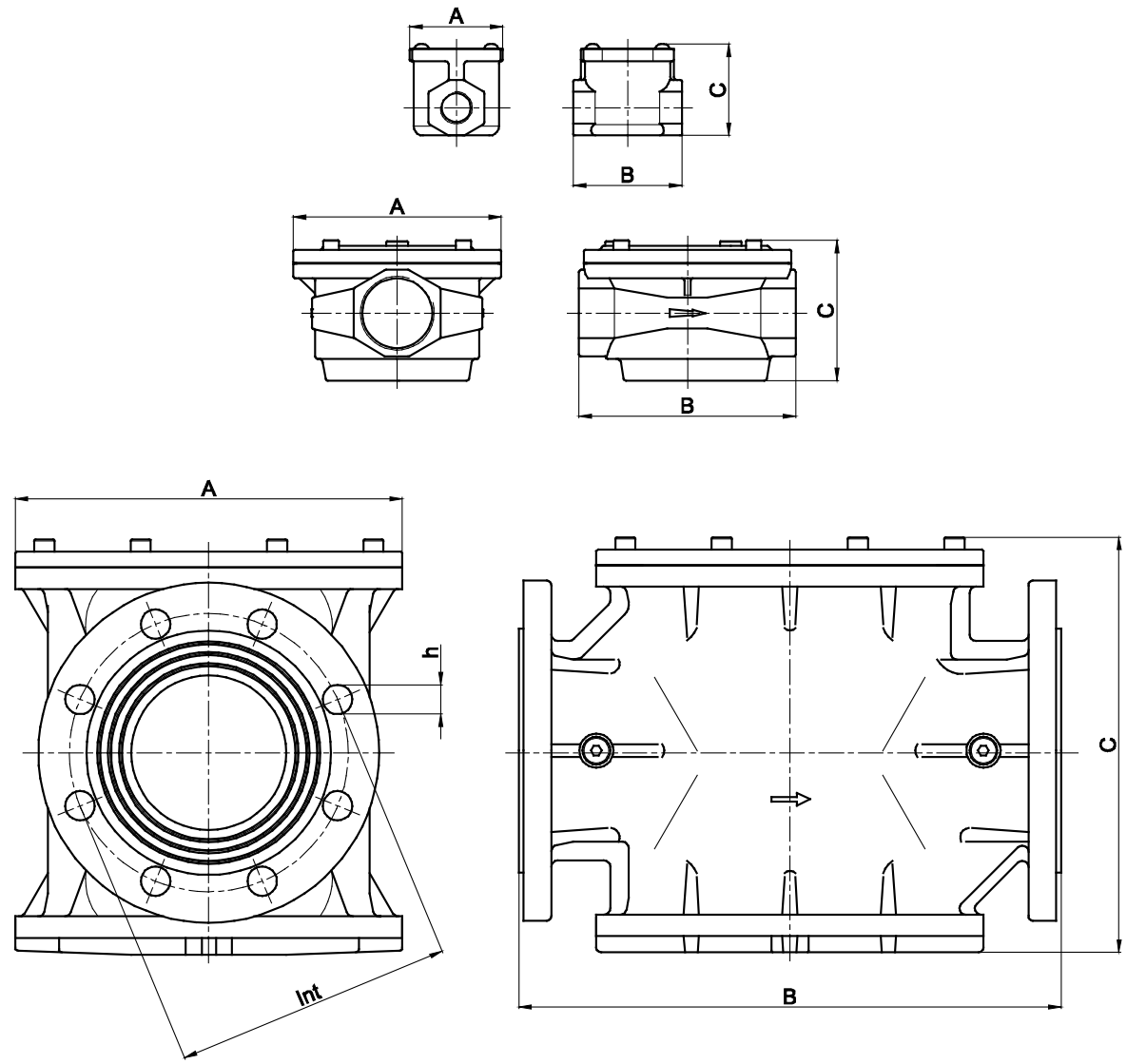
Sectional view



*) Recommended max. velocity at the measurement line port 25 m/s

**) Gauge connections (if available): G1/8“ on models with RP thread and G1/4“ on models with PN16 flange

Dimensions, connection, and weight



Nominal widths / Dimensions	DF50 RP ½"	DF50 RP ¾"	DF50 RP 1"	DF50 RP 1¼"	DF50 RP 1½"	DF50 RP 2"	DF50 DN 65	DF50 DN 80	DF50 DN 100	DF50 DN 125	DF50 DN 150	DF50 DN 200	DF50 DN 250	DF50 DN 300
A [mm]	88	88	134	134	182	182	200	200	250	315	315	370	405	460
B [mm]	96	96	140	140	208	208	308	308	350	460	460	546	600	700
C [mm]	84	84	91	91	128	128	212	212	265	347	347	420	466	537
Int [mm]							145	160	180	210	240	295	355	410
h [mm]							4x18	8x18	8x18	8x18	8x23	12x23	12x28	12x28
Weight [kg]	0.39	0.38	0.97	0.85	2.2	2.0	8.5	8.4	13.5	22.8	24.5	47	69	96

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Types of models / Options

Black epoxy resin coating

To protect the gas filters from influences in aggressive atmospheres.

Types of models

- Biogas or coke oven gas version
- For screw-in filters with flange set DN25-DN50

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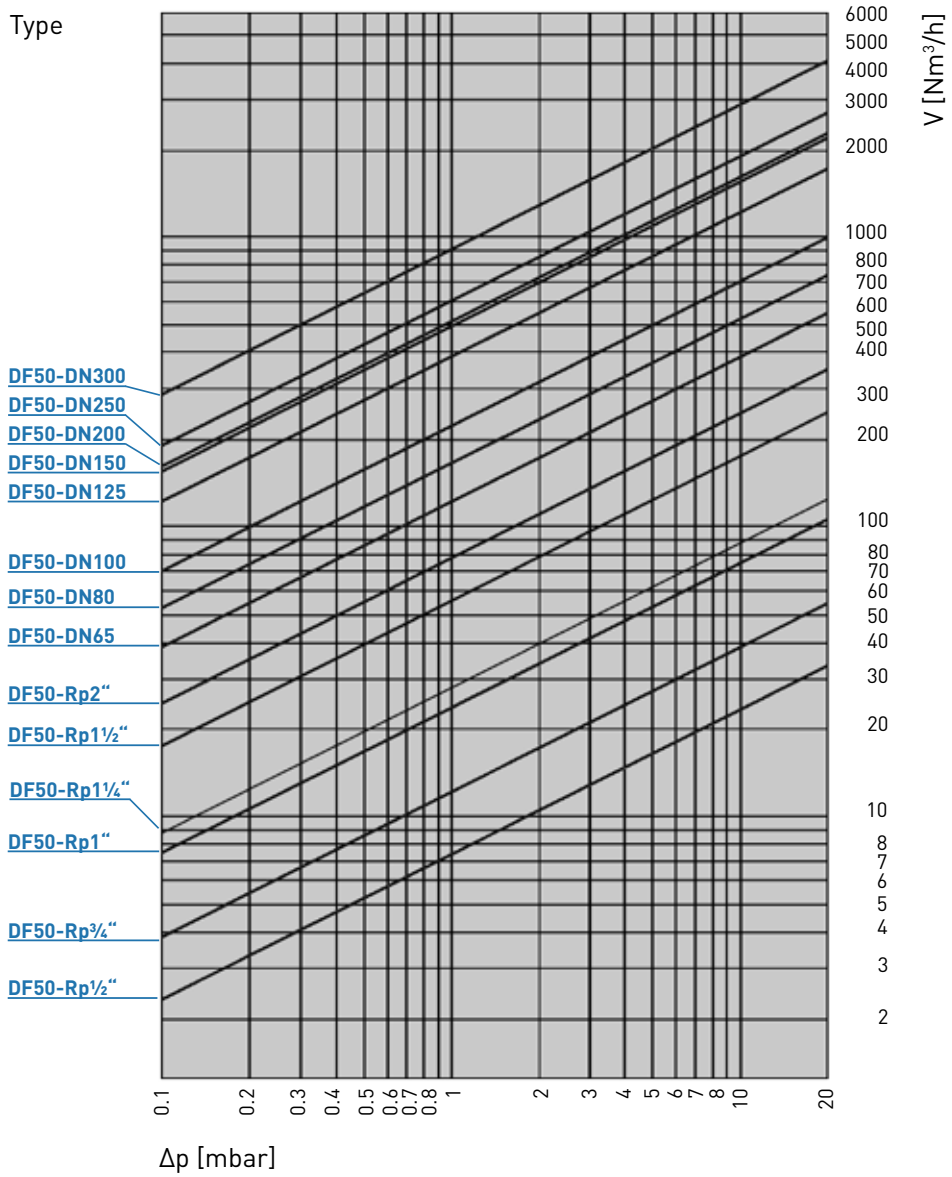
Volume flow diagram

- for natural gas (ρ_n = 0.83 kg/m³; t = 15°C)
- Δp = pressure difference from inlet pressure to outlet pressure
- Q_n = max. possible volume flow
- f - natural gas L conversion factor

Gas	f	Hs,n [kWh/m³]	Gas	f	Hs,n [kWh/m³]
Acetylene	0.84	16.25	Sewage gas	0.84	
Ammonia	1.04	4.83	Carbon monoxide	0.81	3.51
Butane	0.55	37.23	Carbon dioxide	0.65	-
Chlorine	0.51	-	Air	0.80	-
Landfill gas	approx. 0.80		Methane	1.08	11.06
Natural gas L	1.00	9.77	Propane	0.64	28.03
Natural gas H	1.03	11.45	Oxygen	0.76	-
Ethane	0.78	19.55	Sulphur dioxide	0.53	-
Ethylene	0.97	16.516	Nitrogen	0.81	-
Mine gas	(30% CH4)	0.86	Hydrogen	3.04	13.43
Helium	2.15	-			

Pressure loss in unpolluted state



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Design

If the flow rate read from the diagram is based on the operating pressure instead of the pressure at standard conditions (p=1.01325 bar, t=15°C), the pressure drop read from the diagram must be multiplied by the following factor:

(1+ relative pressure in bar)

Example:
With a filter of size Rp1½" and an operating natural gas flow of 80 Nm^3/h, the pressure drop according to the diagram is Δp = 2 mbar. If this 80 Nm^3/h flow is at 2 bar, then the effective pressure drop must be calculated as follows:

Δp = 2 mbar*) x [(1 + 2)x1/bar] = 6 mbar

*) Determined from the diagram

The filter must be selected taking into account the following points:

- Pressure drop of Δp ⩽ 10 mbar
- Flow rates w ⩽ at 20 m/s

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Order data

Example:

Filter type: DF50/1"/6/WAZ/So

	Order code:	DF50	1"	6	WAZ	So
Order selection	**Designation**					
Type						
DF50	DF50	DF50				
DN - Nominal width	Table p. 7		1"			
Max. operating pressure						
2 bar	2					
6 bar	6			6		
Acceptance test certificate to EN 10204/3.1						
without acceptance test certificate	-					
with acceptance test certificate	WAZ				WAZ	
Special model - Black epoxy resin coating - Biogas or coke oven gas version - With flange set - 5 µm	So					So

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