

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

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"

Technical data

Type DF 50

Max. allowable pressure PS 6 bar Rp 1/2" / 3/4" / 1" / 1 1/4" / 1 1/2" / 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 1/2" / 3/4" / 1" / 1 1/2" / 2"
DN 40* / 50* / 65 / 80 / 100 / 125 / 150 / 200 / 250 / 300

Connection type Gas thread ISO 7-1 from Rp1/2 to Rp2 or
ANSI-ASME B1.20 from 1/2"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 -40°C / +80°C (-40°F to +176°F)
(operating/ambient temperature)

Filtering area	Rp 1/2" - 0.0055 m ²	Rp 3/4" - 0.0055 m ²	Rp 1" - 0.0145 m ²
		Rp 2" - 0.0330 m ²	
	DN 65 - 0.0535 m ²	DN 150 - 0.154 m ²	DN 300 - 0.420 m ²
	DN 80 - 0.0535 m ²	DN 200 - 0.276 m ²	
	DN 100 - 0.0860 m ²	DN 250 - 0.310 m ²	

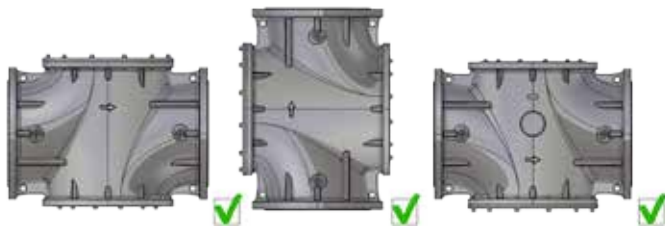
Filtration efficiency Particle size > 30 µm (5 µm optional), filter class G4 to EN 779

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



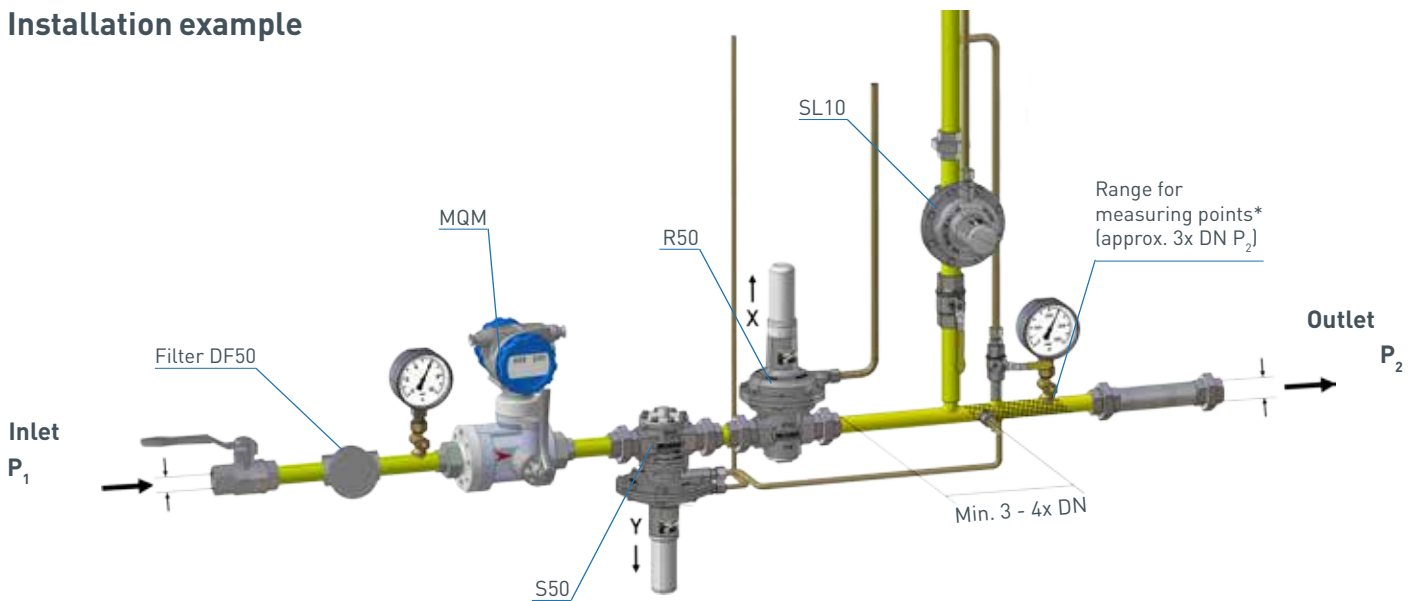
Structure and function

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.

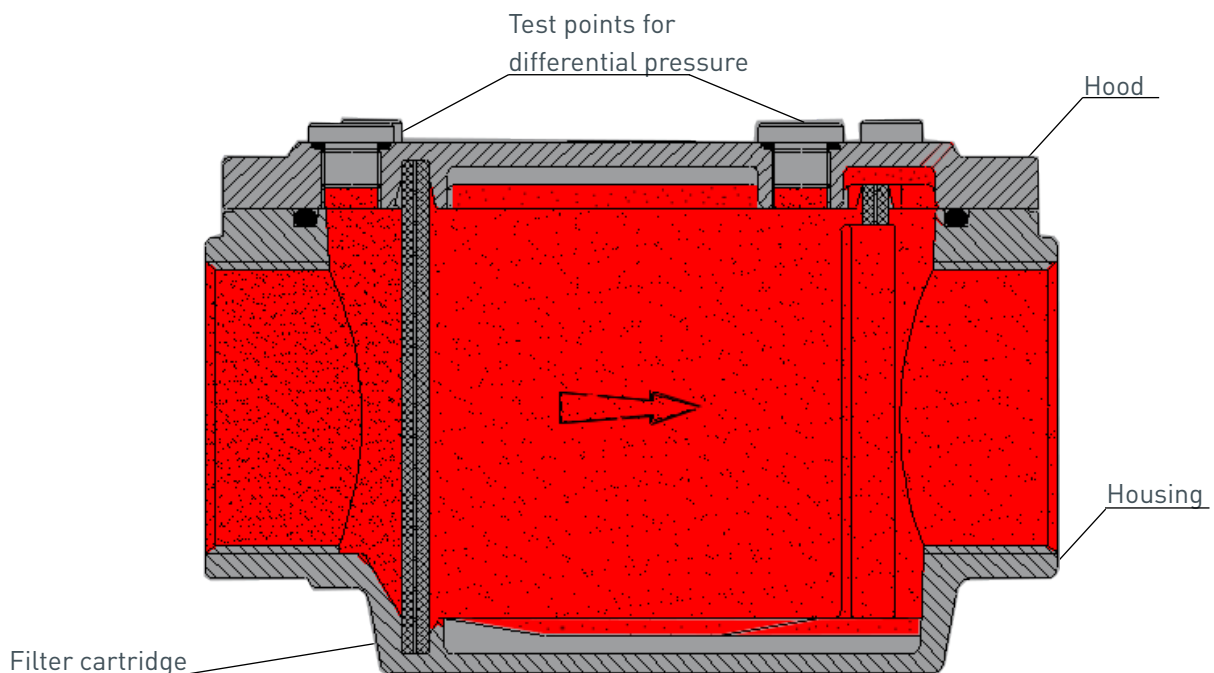
The filters mainly consist of the housing, the cover, and the filter cartridge. Taking off the cover for maintenance and replacement of the filter cartridge guarantees easy access. The filter cartridge is made of non-woven polypropylene fibers, is equipped with a metal support frame and is suitable for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

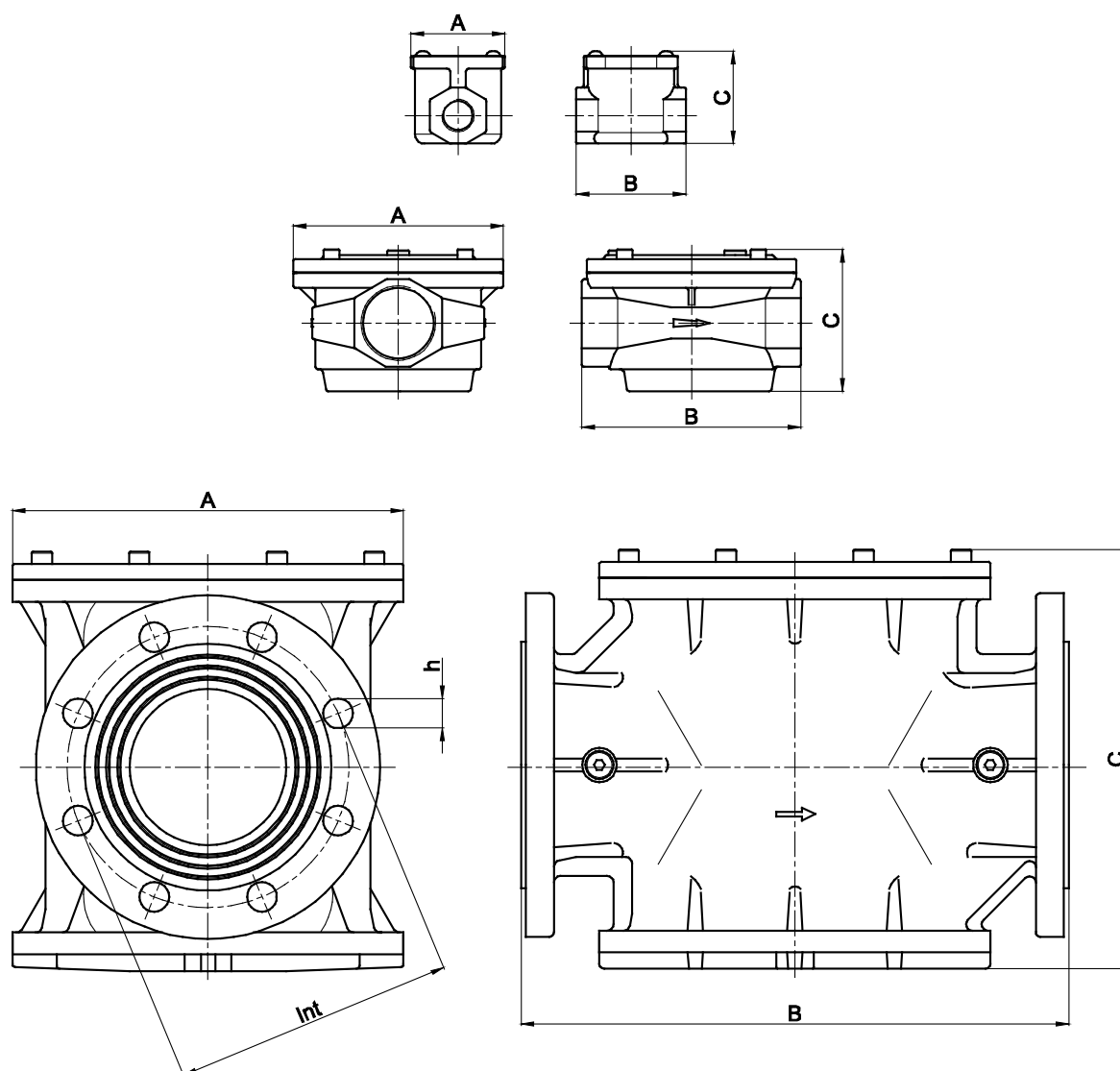


Sectional view



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

Dimensions, connection, and weight



Nominal widths	DF50	DF50	DF50	DF50	DF50	DF50	DF50	DF50	DF50	DF50	DF50	DF50	DF50	DF50
	RP	RP	RP	RP	RP	RP	DN	DN	DN	DN	DN	DN	DN	DN
Dimensions	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	65	80	100	125	150	200	250	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

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

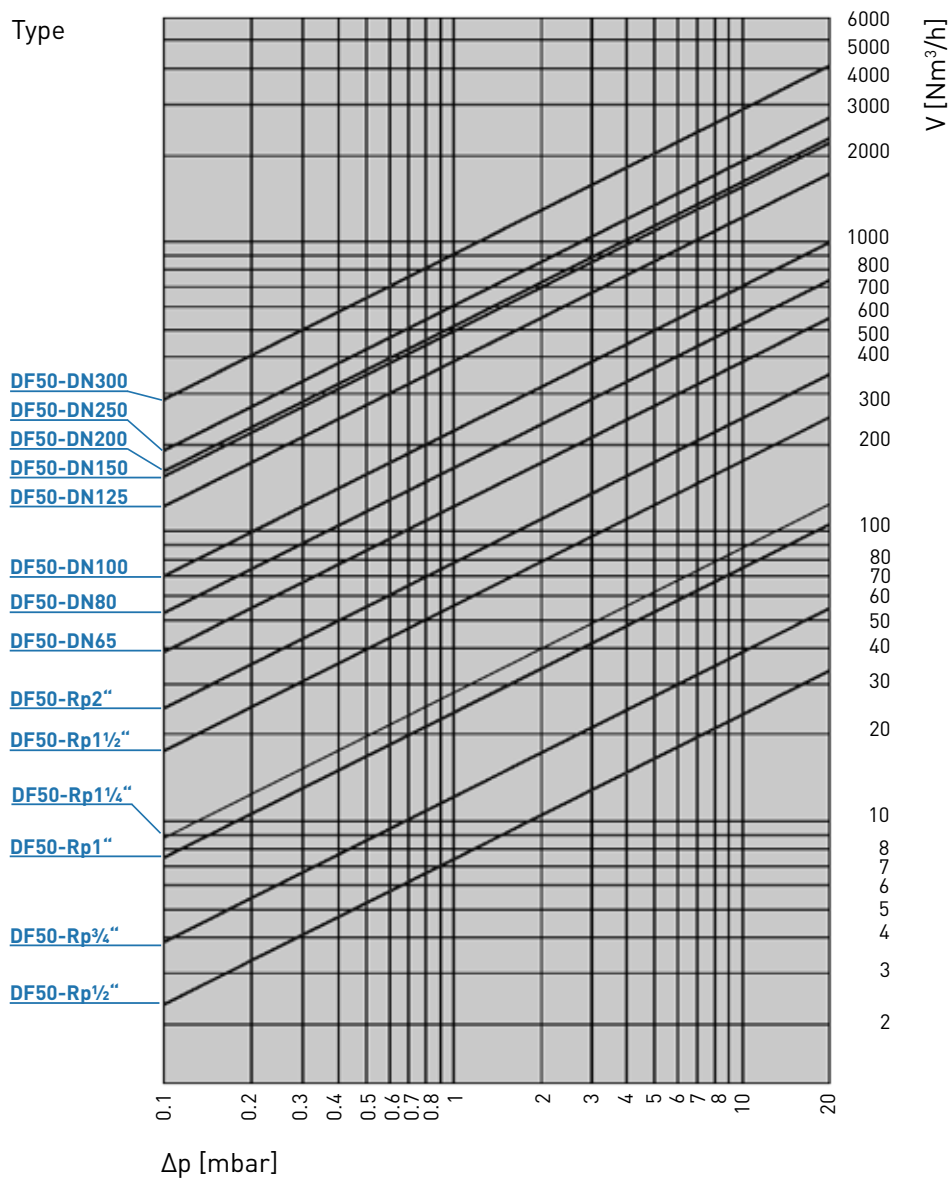


Volume flow diagram

- for natural gas ($\rho_n = 0.83 \text{ kg/m}^3$; $t = 15^\circ\text{C}$)
- Δp = pressure difference from inlet pressure to outlet pressure
- Q_n = max. possible volume flow
- f - natural gas L conversion factor

Gas	f	H _{s,n} [kWh/m ³]	Gas	f	H _{s,n} [kWh/m ³]
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% CH ₄)		0.86	Hydrogen	3.04	13.43
Helium	2.15	-			

Pressure loss in unpolluted state



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, $t=15^{\circ}\text{C}$), the pressure drop read from the diagram must be multiplied by the following factor:

$(1 + \text{relative pressure in bar})$

Example:

With a filter of size Rp1½" and an operating natural gas flow of 80 Nm³/h, the pressure drop according to the diagram is $\Delta p = 2$ mbar. If this 80 Nm³/h flow is at 2 bar, then the effective pressure drop must be calculated as follows:

$$\Delta p = 2 \text{ mbar}^*) \times [(1 + 2) \times 1/\text{bar}] = 6 \text{ mbar}$$

*) Determined from the diagram

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

- Pressure drop of $\Delta p \leq 10$ mbar
- Flow rates $w \leq$ at 20 m/s

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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Contact

If you want to know more about solutions from MEDENUS for the gas industry, please contact your local contact person or go to our internet site at www.medenus.de



Management

Alexander Christiani

Phone: +49 (0) 2761 / 82788-18
Fax: +49 (0) 2761 / 82788-9
E-mail: a.christiani@medenus.de



Head of Inside Sales Department

Manuel Schepp

Phone: +49 (0) 2761 / 82788-20
Fax: +49 (0) 2761 / 82788-9
E-mail: m.schepp@medenus.de



Head of Sales & Marketing

Franz Feichtner

Phone: +43 (0) 7227 / 211-17
Fax: +49 (0) 2761 / 82788-9
Mobile phone: +49 (0) 151 / 51002711
E-mail: f.feichtner@medenus.de



Inside Sales Department

Stefanie Müller

Phone: +49 (0) 2761 / 82788-13
Fax: +49 (0) 2761 / 82788-9
E-mail: s.mueller@medenus.de



Inside Sales Department

Natalia Kadyrka

Phone: +49 (0) 2761 / 82788-11
Fax: +49 (0) 2761 / 82788-9
E-mail: n.kadyrka@medenus.de

Trade representation worldwide
medenus.de/de/kontakt.html



MEDENUS

Gas-Druckregeltechnik GmbH

Im Langen Feld 3
D-57462 Olpe
Phone: +49 (0)2761 82788-0
Fax: +49 (0)2761 82788-9
E-mail: info@medenus.de
Internet: www.medenus.de



MEDENUS Gas-Druckregeltechnik GmbH

Phone +49 (0)2761 82788-0

Fax +49 (0)2761 82788-9

Im Langen Feld 3 / D-57462 Olpe

info@medenus.de

www.medenus.de

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