

Gas pressure regulators VGBF

TECHNICAL INFORMATION

- Pressure regulators for gaseous media for installation in all types of gas appliances
- Design with inlet pressure compensation diaphragm ensures high control accuracy
- High flow rate due to optimal dimensioning
- Internal impulse on VGBF..05
- Feedforwarding the furnace chamber pressure is possible
- No breather line required
- Suitable for hydrogen



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1 Application



VGBF..R



VGBF..TN



VGBF..F



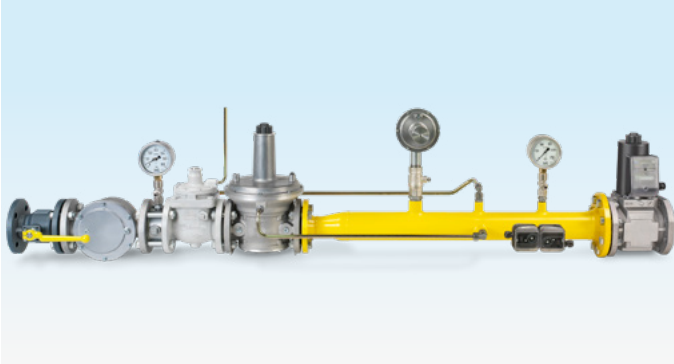
VGBF..TA

The spring-loaded gas pressure regulator VGBF with inlet pressure compensation diaphragm and zero shut-off serves to maintain the set outlet pressure constant despite changing gas flow rates and inlet pressures in gas pipelines. Thanks to an additional safety diaphragm, no breather line is required, except for installation pursuant to NFPA 86, see page 19 (6.4 Installation to NFPA 86).

1 Application

For use in gas inlet sections in all sectors of the iron, steel, glass and ceramics industries as well as in commercial heat generation, such as the packaging, paper and foodstuffs industries.

1.1 Application examples



Gas inlet section

2 Certification

2.1 Certificate download

Certificates – see www.docuthek.com

2.2 Declaration of conformity



We, the manufacturer, hereby declare that the products VG-BF with product ID No. CE-0085AQ0973 comply with the requirements of the listed Directives and Standards.

VGBF 15–150:

Regulation:

- (EU) 2016/426 – GAR

Standards:

- EN 88-1
- EN 88-2:2008
- EN 334:2009

VGBF 100F40:

Directives:

- 2014/68/EU – PED
- 2011/65/EU – RoHS II
- 2015/863/EU – RoHS III

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 and for VGBF 100F40 pursuant to Directive 2014/68/EU Annex III

Module D1. This declaration of conformity is issued under the sole responsibility of the manufacturer.
Elster GmbH

2.3 UKCA certified



Gas Appliances (Product Safety and Metrology etc. (Amendment etc.) (EU Exit) Regulations 2019)

BS EN 88-1:2011+A1:2016, BS EN 88-2:2007, BS EN 334:2005+A1:2009, BS EN 13611:2019

2.4 Eurasian Customs Union



The products VGBF meet the technical specifications of the Eurasian Customs Union.

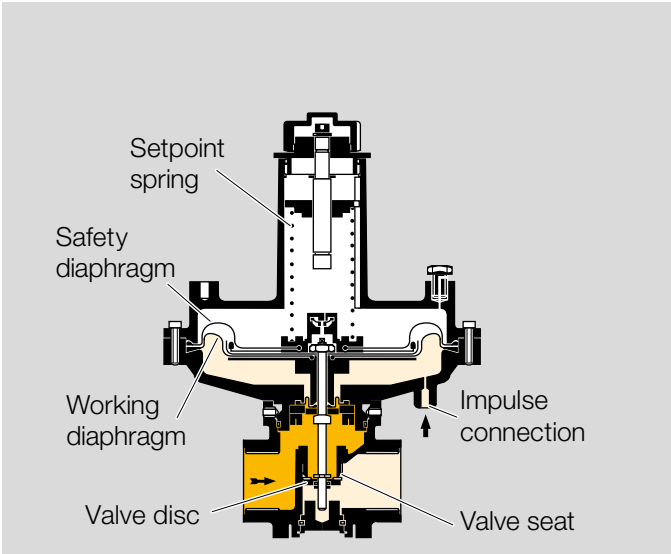
2.5 REACH Regulation

The device contains substances of very high concern which are listed in the Candidate List of the European REACH Regulation No. 1907/2006. See Reach list HTS at www.docuthek.com.

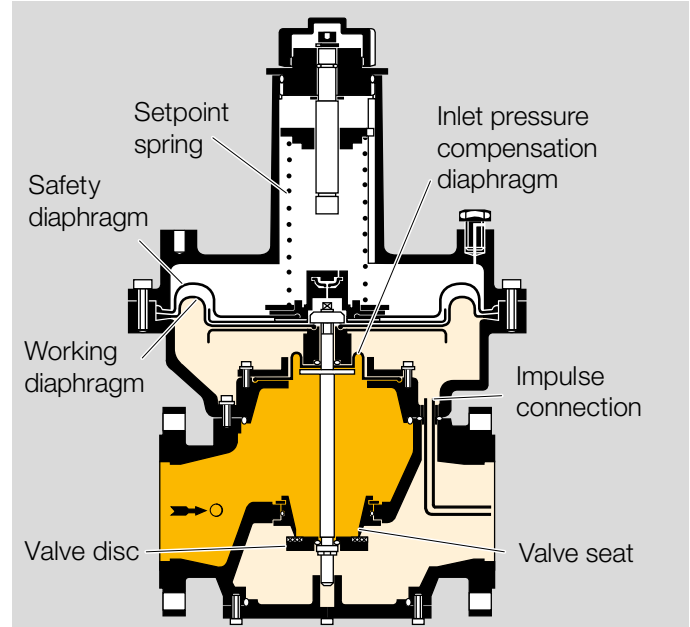
2.6 China RoHS

Directive on the restriction of the use of hazardous substances (RoHS) in China. Scan of the Disclosure Table China RoHS2, see certificates at www.docuthek.com.

3 Function

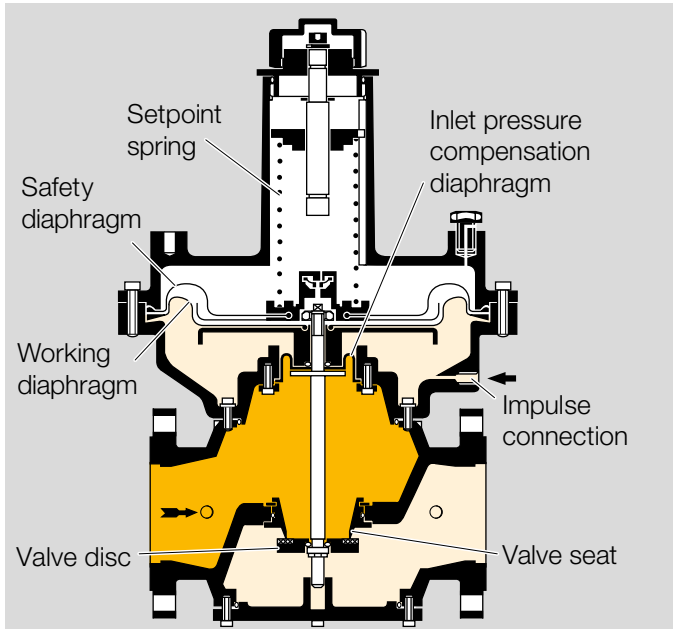


VGBF..R10, VGBF..R40



VGBF..F05

3 Function

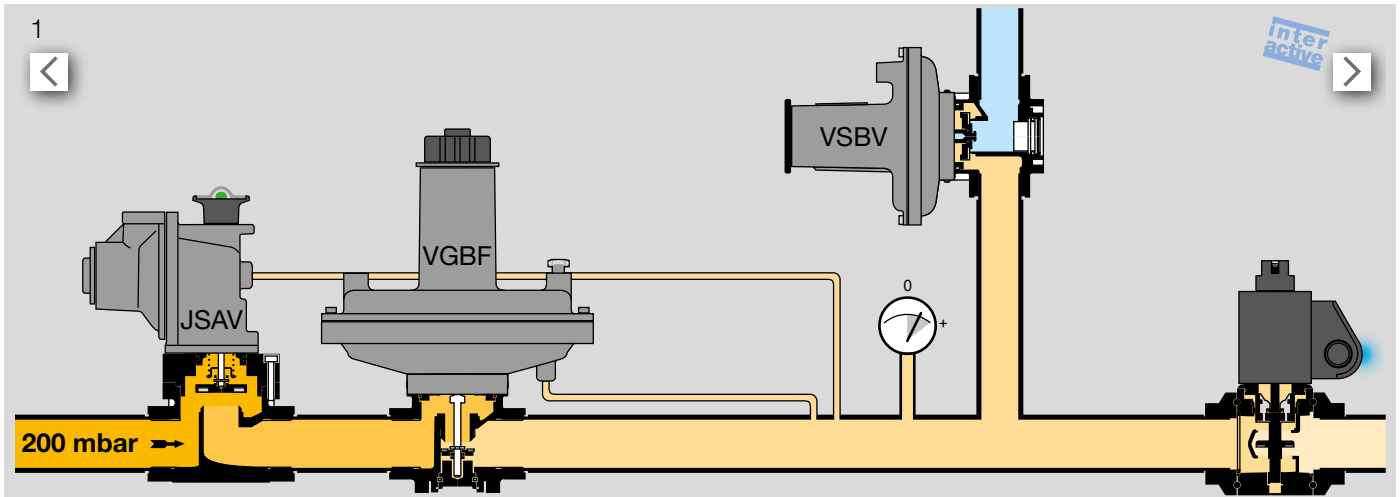


VGBF..F10, VGBF..F40

Gas pressure regulator VGBF is open when no pressure is applied. The gas supply is opened slowly and the gas flows via the open valve seat to the pressure regulator outlet. The outlet pressure is applied to the space beneath the working diaphragm via the impulse line. As soon as the outlet pressure corresponds to the set spring force, the working diaphragm lifts and the valve disc connected to it reduces the flow rate. If the outlet pressure drops, e.g. due to switching on a consumer, the valve disc is opened further and the outlet pressure increases again. If the outlet pressure increases, e.g. due to reduced consumption, the valve disc is closed further and the outlet pressure decreases again.

Thus, the outlet pressure is maintained constant despite changing gas flow rates. If consumption is stopped, the valve disc cuts off the flow completely (zero shut-off). Fluctuations in the inlet pressure are compensated by the inlet pressure compensation diaphragm. Pressure test nipples can be installed to measure the inlet and outlet pressures.

3.1 Slide show – combination of JSAV, VGBF and VSBV



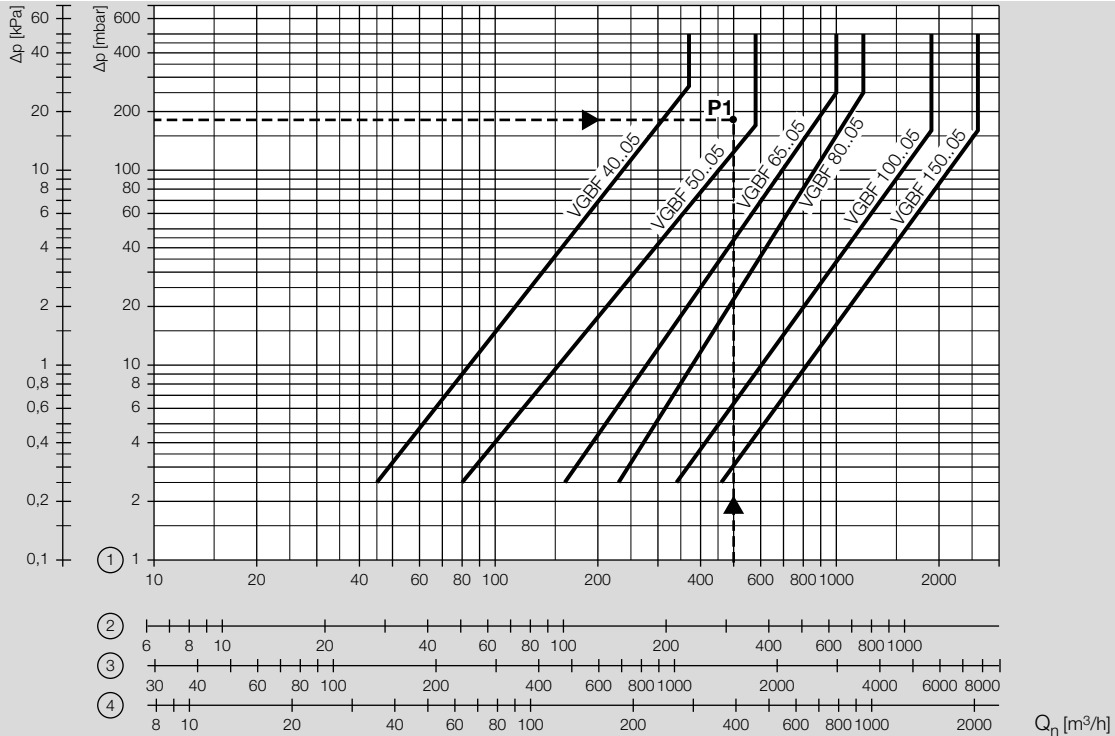
- 1 The gas pressure regulator VGBF keeps the outlet pressure constant when the gas flow rate fluctuates due to varying capacity requirements. The safety shut-off valve JSAV protects downstream fittings against excessive gas inlet pressure. The safety relief valve VSBV is designed to eliminate brief pressure surges to prevent the undesired actuation of safety shut-off valve JSAV.
- 2 Specimen setting values using the pressure level diagram: VGBF: 60 mbar, VSBV: 100 mbar, JSAV: 180 mbar. The gas train therefore has reliable protection up to a maximum operating pressure of 200 mbar, see“- Pressure levels for setting GPR, SRV and SSV” app.
- 3 The gas solenoid valve is closed.
- 4 The pressure downstream of the VGBF rises and is reduced by the VSBV when it reaches the set value.
- 5 The VSBV opens until the pressure falls below the set value.
- 6 As no more gas is flowing, the VGBF closes (zero shut-off) and prevents the outlet pressure rising again.
- 7 New example with a large pipe volume:
- 8 With a large pipe volume, it is possible that the VSBV cannot reduce the pressure quickly enough. In this case, the JSAV will trip.
- 9 The gas solenoid valve is closed.
- 10 The pressure downstream of the VGBF rises and is reduced by the VSBV when it reaches the set value.

3 Function

- 11** As the pressure cannot be reduced quickly enough, it will continue to rise until the JSAV trips.
- 12** The JSAV must then be reset manually.

4 Flow rate

4.1 VGBF.05



1 = natural gas ($\rho = 0.80 \text{ kg/m}^3$)

2 = propane ($\rho = 2.01 \text{ kg/m}^3$)

3 = hydrogen ($\rho = 0.09 \text{ kg/m}^3$)

4 = air ($\rho = 1.29 \text{ kg/m}^3$)

Example

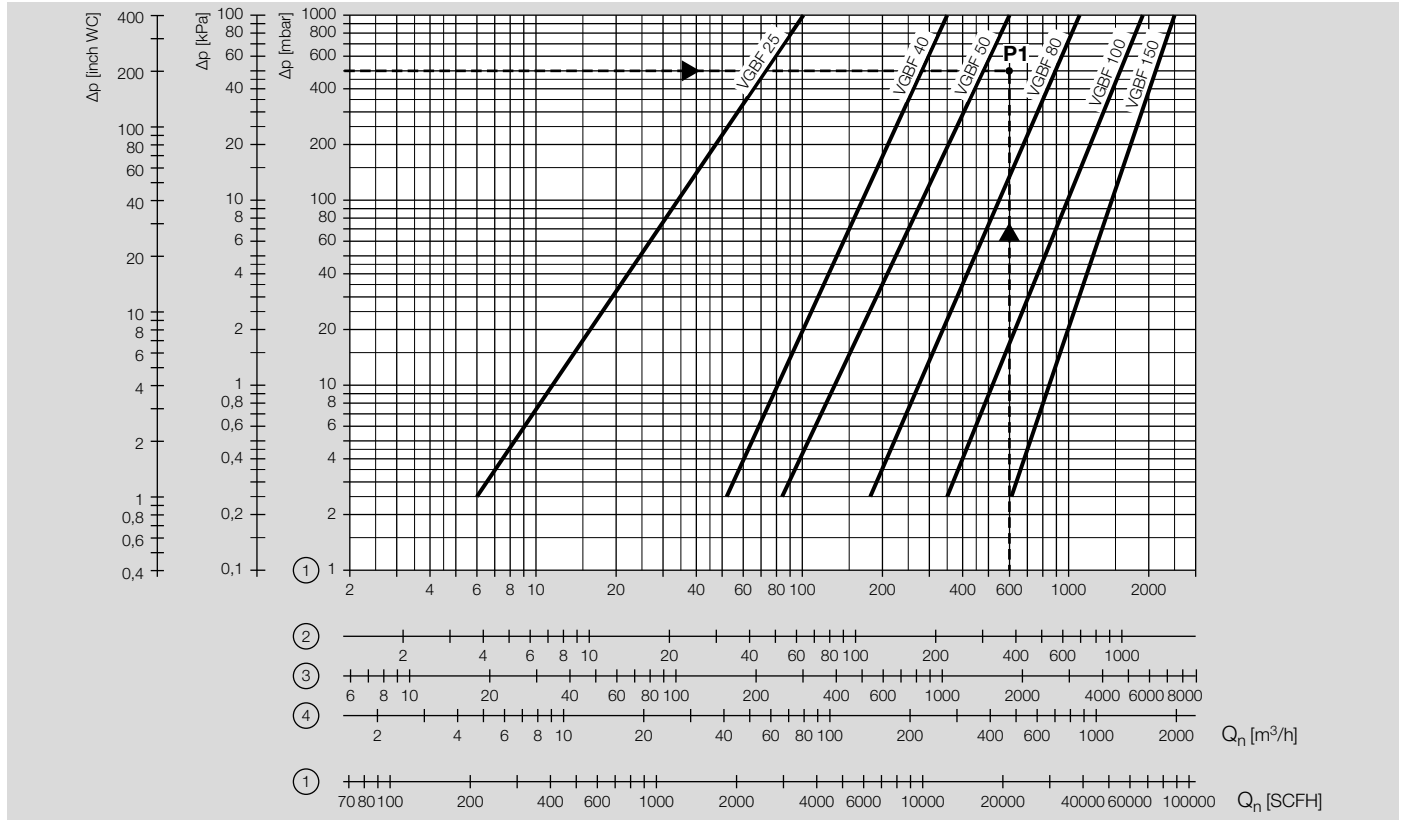
Gas type: natural gas,
 flow rate $Q = 500 \text{ m}^3/\text{h}$,
 inlet pressure $p_u = 200 \text{ mbar}$ (20 kPa),
 outlet pressure $p_d = 20 \text{ mbar}$ (2 kPa),
 pressure loss $\Delta p = p_u - p_d = 180 \text{ mbar}$ (18 kPa).

4 Flow rate

The result is intersection P1. The next largest nominal size is selected: VGBF 50..05.

At a pressure loss of $\Delta p = 180 \text{ mbar}$ (18 kPa), the max. flow rate is $Q_{\text{max.}}: 580 \text{ m}^3/\text{h}$, the min. flow rate $Q_{\text{min.}}$ is derived from $Q_{\text{min.}} = Q_{\text{max.}} \times 10\% = 58 \text{ m}^3/\text{h}$.

4.2 VGBF.10



- 1 = natural gas ($\rho = 0.80 \text{ kg/m}^3$)
- 2 = propane ($\rho = 2.01 \text{ kg/m}^3$)
- 3 = hydrogen ($\rho = 0.09 \text{ kg/m}^3$)
- 4 = air ($\rho = 1.29 \text{ kg/m}^3$)

Example

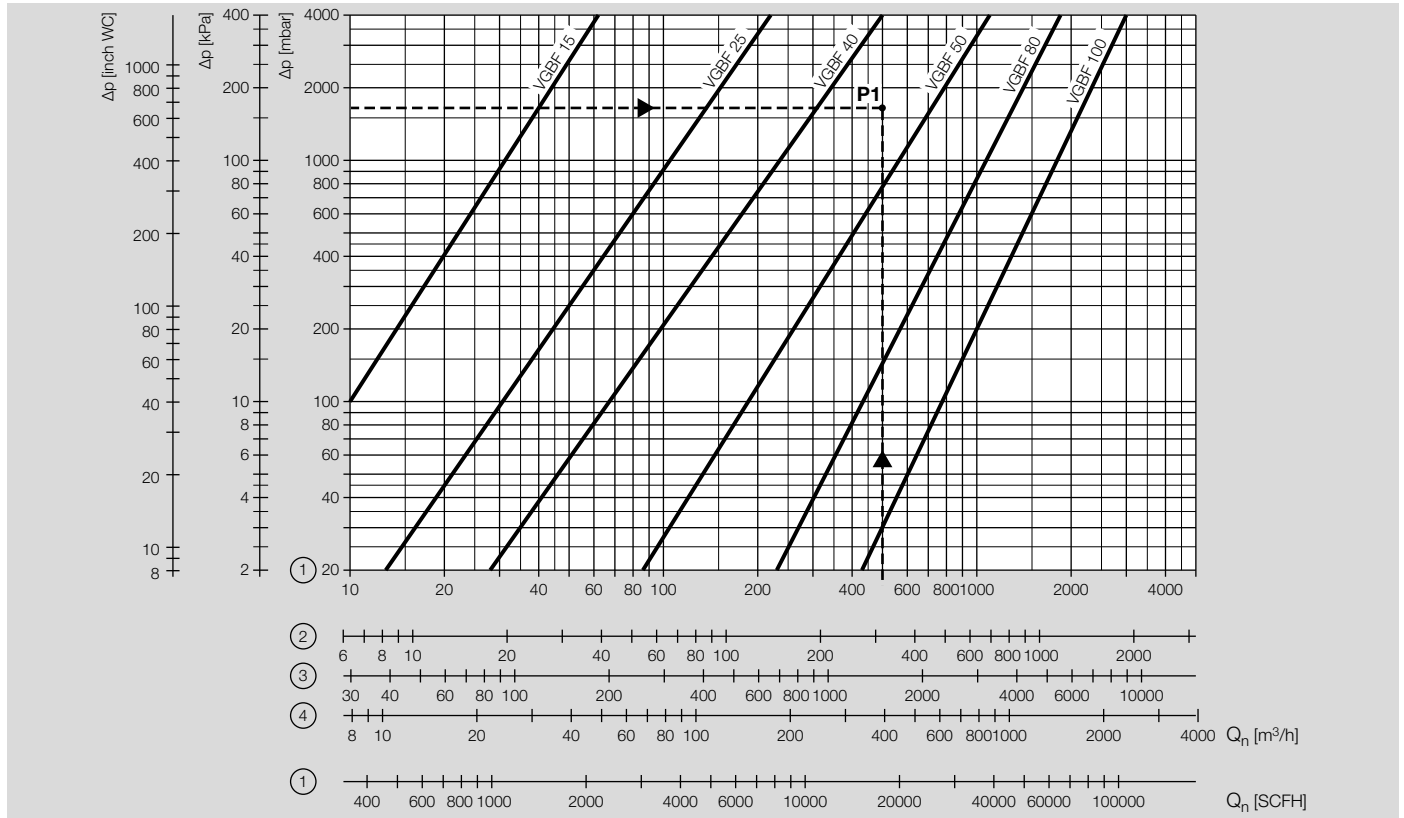
Gas type: natural gas,
 flow rate $Q = 600 \text{ m}^3/\text{h}$,
 inlet pressure $p_u = 600 \text{ mbar}$ (60 kPa),
 outlet pressure $p_d = 100 \text{ mbar}$ (10 kPa),
 pressure loss $\Delta p = p_u - p_d = 500 \text{ mbar}$ (50 kPa).

4 Flow rate

The result is intersection P1. The next largest nominal size is selected: VGBF 80..10.

At a pressure loss of $\Delta p = 500$ mbar (50 kPa), the max. flow rate is $Q_{\max.}: 910$ m³/h, the min. flow rate $Q_{\min.}$ is derived from $Q_{\min.} = Q_{\max.} \times 10\% = 91$ m³/h.

4.3 VGBF..40



- 1 = natural gas ($\rho = 0.80$ kg/ m^3)
- 2 = propane ($\rho = 2.01$ kg/ m^3)
- 3 = hydrogen ($\rho = 0.09$ kg/ m^3)
- 4 = air ($\rho = 1.29$ kg/ m^3)

Example

Gas type: natural gas,
 flow rate $Q = 500$ m^3/h ,
 inlet pressure $p_u = 2$ bar (200 kPa),
 outlet pressure $p_d = 300$ mbar (30 kPa),
 pressure loss $\Delta p = p_u - p_d = 1.7$ bar (170 kPa).

4 Flow rate

The result is intersection P1. The next largest nominal size is selected: VGBF 50..40.

At a pressure loss of $\Delta p = 1.7$ bar (170 kPa), the max. flow rate is $Q_{\max.}$: 700 m³/h, the min. flow rate $Q_{\min.}$ is derived from $Q_{\min.} = Q_{\max.} \times 10\% = 70$ m³/h.

4.4 Calculating the nominal size

A web app for calculating the nominal size is available at www.adlatus.org.

5 Selection

5.2 VGBF with Rp internal thread or with ISO flange

5.1 ProFi

A web app selecting the correct product is available at www.adlatus.org.

Description	Code	VGBF 15	VGBF 25	VGBF 40	VGBF 50	VGBF 65	VGBF 80–100	VGBF 150	Condition
Gas pressure regulator	VGBF	•	•	•	•	•	•	•	
Nominal size	15–150	15	25	40	50	65	80, 100	150	
Pipe connection									
Rp internal thread	R	•	•	•					
Flange to ISO 7005	F			•	•	•	•	•	
Inlet pressure									
p_U max. 500 mbar (50 kPa, 7.25 psig)	05			•	•	•			500 mbar (50 kPa) for flange version only
p_U max. 1 bar (100 kPa, 14.5 psig)	10		•	•	•		•	•	
p_U max. 4 bar (400 kPa, 58 psig)	40	•	•	•	•		•		
Pressure test point									
Screw plug at the inlet	-1	•	•						
Screw plug at the inlet and outlet	-3			•	•	•	•	•	
Viton equipment for gas or air (without approval)	V			•	•	•	•	•	Viton equipment for flange version and max. 1 bar (100 kPa) only
Special outlet pressure range	Z	•	•	•	•	•	•	•	When ordering a VGBF..Z, be sure to specify the desired outlet pressure range.

Order example

VGBF 50F05-3

5.3 VGBF..T with NPT internal thread or with ANSI flange

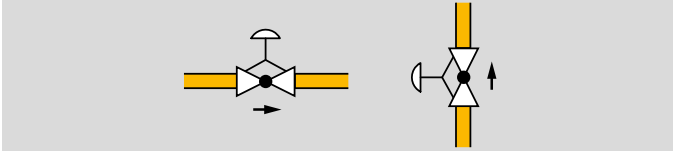
Description	Code	VGBF..T 15–25	VGBF..T 40	VGBF..T 50	VGBF..T 80–100	Condition
Gas pressure regulator	VGBF..T	•	•	•	•	
Nominal size	15–100	15, 25	40	50	80, 100	
Pipe connection						
NPT internal thread	N	•	•	•		
ANSI flange	A			•	•	
Inlet pressure						
p_U max. 1 bar (100 kPa, 14.5 psig)	10	•	•	•	•	
p_U max. 4 bar (400 kPa, 58 psig)	40	•	•	•	•	
Pressure test point						
Screw plug at the outlet	-2	•				
Screw plug at the inlet and outlet	-3		•	•	•	
Special outlet pressure range	Z	•	•	•	•	When ordering a VGBF..T..Z, be sure to specify the desired outlet pressure range.

Order example

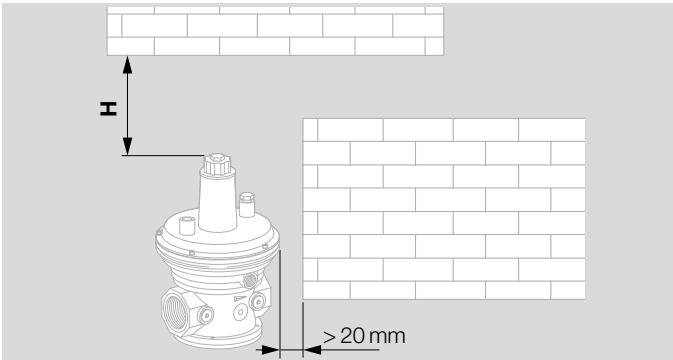
VGBF 50TN40-3

6 Project planning information

6.1 Installation



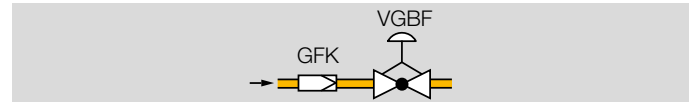
Installation position: any, not upside down. Recommended installation position as of nominal size DN 65: spring dome pointing vertically upwards.



The gas pressure regulator VGBF must not be in contact with masonry. Minimum clearance 20 mm. Ensure that there is sufficient space for installation and for changing the spring **H**.

Type	Distance H [mm]
VGBF 15	120
VGBF25, VGBF 40	180
VGBF 50	200
VGBF 65, VGBF 80	320
VGBF 100, VGBF 150	360

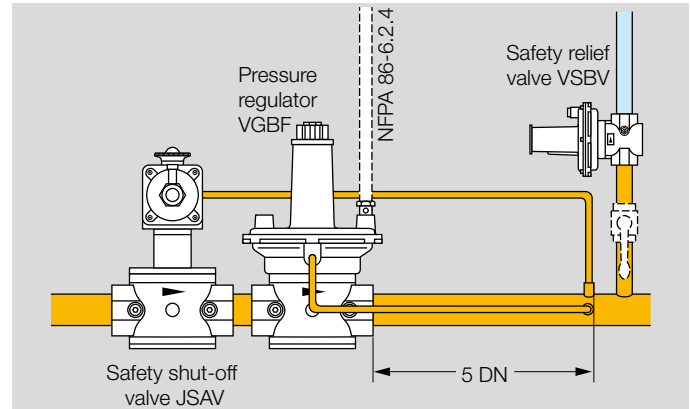
Do not store or install the unit in the open air.



Sealing material and dirt, e.g. thread cuttings, must not be allowed to get into the regulator housing. Install a filter (GFK) upstream of every system.

6.2 Installation to EN 746-2

In accordance with EN 746-2, a safety shut-off valve upstream of the gas pressure regulator and a safety relief valve are required for gas pressure control systems.



These valves are not required if the highest possible operating pressure upstream of the regulator cannot exceed the maximum allowable operating pressure of the downstream devices.

6.3 Installing the impulse line

Gas pressure regulator VGBF..F05 features an internal feed-back function. On VGBF..F10 and VGBF..F40, the feedback function is performed via an external impulse line (5 x DN), see illustration at 6.2.

6.4 Installation to NFPA 86

NFPA 86-8.2.10 and NFPA 86-6.2.4

If the inlet pressure to a fuel pressure regulator exceeds the pressure rating of any component, overpressure protection shall be provided.

With reference to NFPA 86-6.2.4:

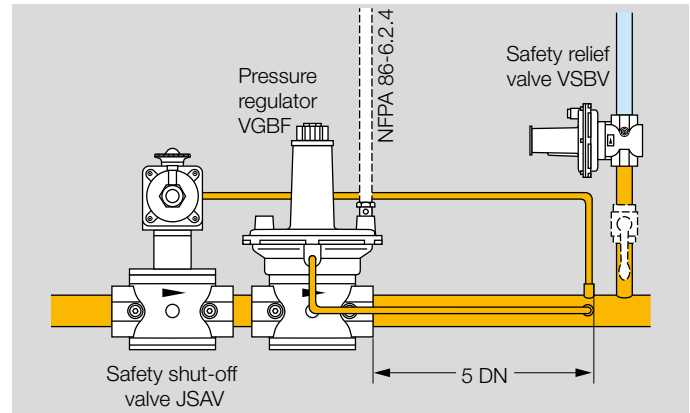
The gas pressure regulator requires a relief line on the spring dome, see illustration at 6.2.

It is always recommended to consult the respective local field inspector on this topic.

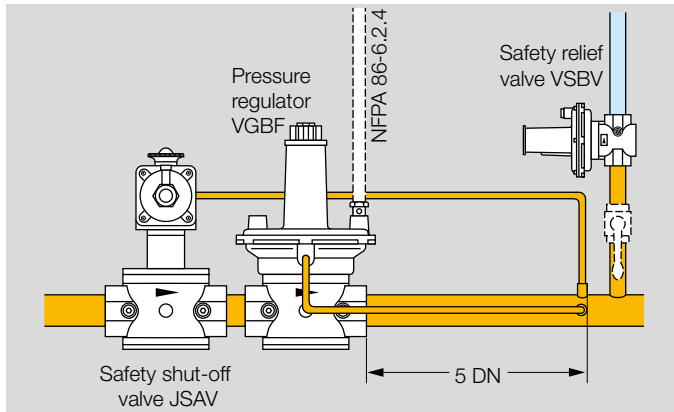
6.5 Feedforwarding the furnace chamber pressure

If furnace pressure varies, a combustion chamber control line can be connected to the breather orifice in order to maintain a constant burner capacity. Connecting thread, see page 24 (9.1 VGBF with Rp internal thread or with ISO flange).

This application is only permitted for a maximum furnace chamber pressure between 0 and +100 mbar (10 kPa) and for slow pressure changes.



6.6 Pressure levels



The opening pressure of the safety relief valve (VSBV) and trip pressures for the safety shut-off valve (JSAV) are calculated on the basis of the outlet pressure set on the pressure regulator.

The “Pressure levels for setting GPR, SRV and SSV” app helps to calculate the various setting values, see www.ad-latus.org.

6.7 Hydrogen



Other hydrogen-compatible products can be found here: [Technical Information, Products for hydrogen](#).

7 Accessories

7.1 Damping valve



VGBF..10 and VGBF..40: damping valve for Rp 3/8 impulse line.

VGBF..T: damping valve not available.

VGBF 15–25: not required.

VGBF 40–100..40: loosely enclosed.

Can be ordered on request for VGBF 40–150..10.

Order No. 74924681.

8 Technical data

8.1 Ambient conditions

Icing, condensation and dew in and on the unit are not permitted.

Avoid direct sunlight or radiation from red-hot surfaces on the unit. Note the maximum medium and ambient temperatures!

Avoid corrosive influences, e.g. salty ambient air or SO₂.

In outdoor installations, the gas line must be protected against weather influence, e.g. by adequate enclosure or roofing.

Ambient temperature: -20 to +60°C (-4 to +140°F), VGBF.V: 0 to 60°C (32 to 140°F).

Long-term use in the upper ambient temperature range accelerates the ageing of the elastomer materials and reduces the service life (please contact manufacturer).

This unit is not suitable for cleaning with a high-pressure cleaner and/or cleaning products.

8.2 Mechanical data

Gas type: natural gas, town gas, LPG (gaseous), hydrogen and biogas (max. 0.02 %-by-vol. H₂S), VGBF.V for air.

Transport, storage and medium temperatures = ambient temperature.

The outlet pressure range is reached through the use of different springs, see page 23 (8.3 Spring table).

Rp 1/4 for test points or even for a pilot gas supply line: at the inlet: VGBF 15 and 25,

at inlet and outlet: VGBF 40–150.

Strainers that are possibly fitted serve as flow conditioners.

Housing: aluminium,
diaphragms: NBR or Viton,
valve seat: aluminium,
valve stem: aluminium,
valve plate: vulcanized NBR or Viton seal.

Internal thread: Rp to ISO 7-1,
flanged connection: PN 16 to ISO 7005,
DN 15–50 available with NPT thread,
DN 50–100 available with ANSI flange.
Impulse line connections: NPT.

VGBF..10

Max. inlet pressure $p_{u \max.}$: 1 bar (100 kPa).

Feedback via impulse line: Rp 1/4 connection for DN 15 and 25, Rp 3/8 connection for DN 40–150.

EN 334, accuracy class AC 10, lock-up pressure class: 5–50 mbar (0.5–5 kPa) = SG 30, > 50 mbar (5 kPa) = SG 20.

VGBF..40

Max. inlet pressure $p_{u \max.}$: 4 bar (400 kPa).

Feedback via impulse line: Rp 1/4 connection for DN 15 and 25, Rp 3/8 connection for DN 40–100.

EN 334, accuracy class AC 10, lock-up pressure class: 5–50 mbar (0.5–5 kPa) = SG 30, > 50 mbar (5 kPa) = SG 20.

VGBF..05

Max. inlet pressure $p_{u \max.}$: 500 mbar (50 kPa).

Internal feedback.

EN 88, Class A, Group 2.

8.3 Spring table

Outlet pressure range			Order No.				Marking
mbar	kPa	"WC	VGBF 15	VGBF 25	VGBF 40	VGBF 50	
5–12.5	0.5–1.25	2–5	75421911	75421961	75421961	75422031	–
10–30 ¹⁾	1–3	4–12	75421921	75421971	75421971	75422041	red
25–45	2.5–4.5	10–18	75421931	75421980	75421980	75422051	yellow
40–60	4–6	16–32	75421941	75421990	75421990	75422061	green
55–75	5.5–7.5	21–29	75421951	75422000	75422000	75422071	blue
70–90	7–9	27–35	75442046	75422010	75422010	75422081	black
85–105	8.5–10.5	33–41	75442047	75422020	75422020	75422091	white
100–160 ²⁾	10–16	39–62	75442048	75438978	75438978	75438981	black/red
150–230	15–23	58.5–90	75442049	75438979	75438979	75438982	black/yellow
220–350	22–35	86–136.5	75442050	75438980	75438980	75438983 ³⁾	black/green

Outlet pressure range			Order No.				Marking
mbar	kPa	"WC	VGBF 65	VGBF 80	VGBF 100	VGBF 150	
5–12.5	0.5–1.25	2–5	75426160	75426230	75426310	75426450	–
10–30 ¹⁾	1–3	4–12	75426170	75426240	75426320	75426460	red
25–45	2.5–4.5	10–18	75426180	75426250	75426330	75426470	yellow
40–60	4–6	16–32	75426190	75426260	75426340	75426480	green
55–75	5.5–7.5	21–29	75426200	75426270	75426350	75426490	blue
70–90	7–9	27–35	75426210	75426280	75426360	75426500	black
85–105	8.5–10.5	33–41	75426220	75426290	75426370	75426510	white
100–160 ²⁾	10–16	39–62	75446329	75438984	75438987	75438990	black/red
150–230	15–23	58.5–90	–	75438985	75438988	–	black/yellow
220–350	22–35	86–136.5	–	75428986	75438989	–	black/green

Dispatch complete with label for changed outlet pressure.

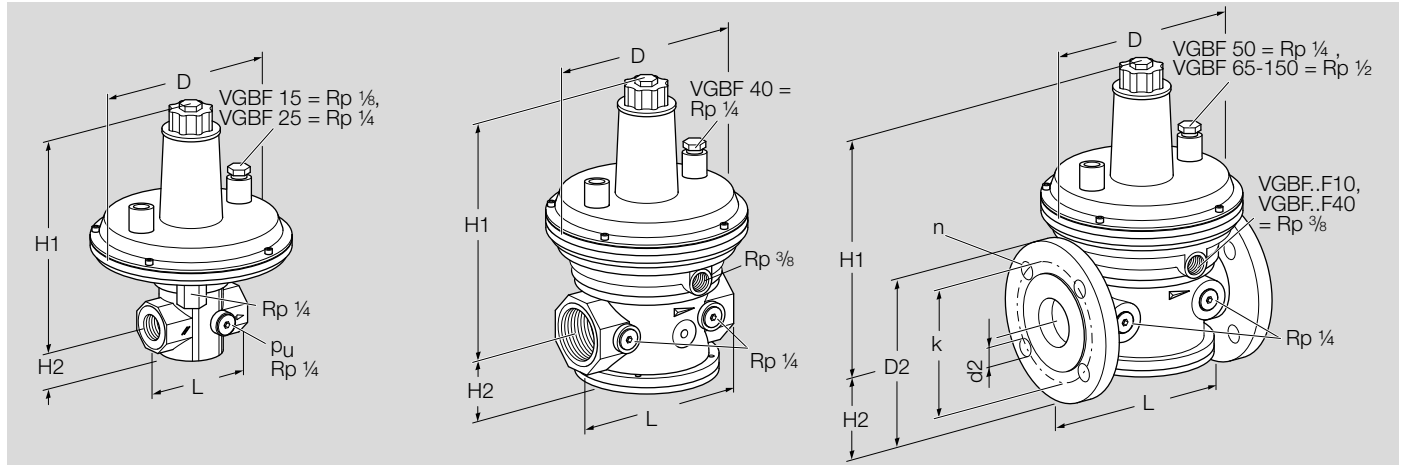
¹⁾ Standard spring.

²⁾ T-products range standard spring.

³⁾ Spring set comprising two springs.

9 Dimensions

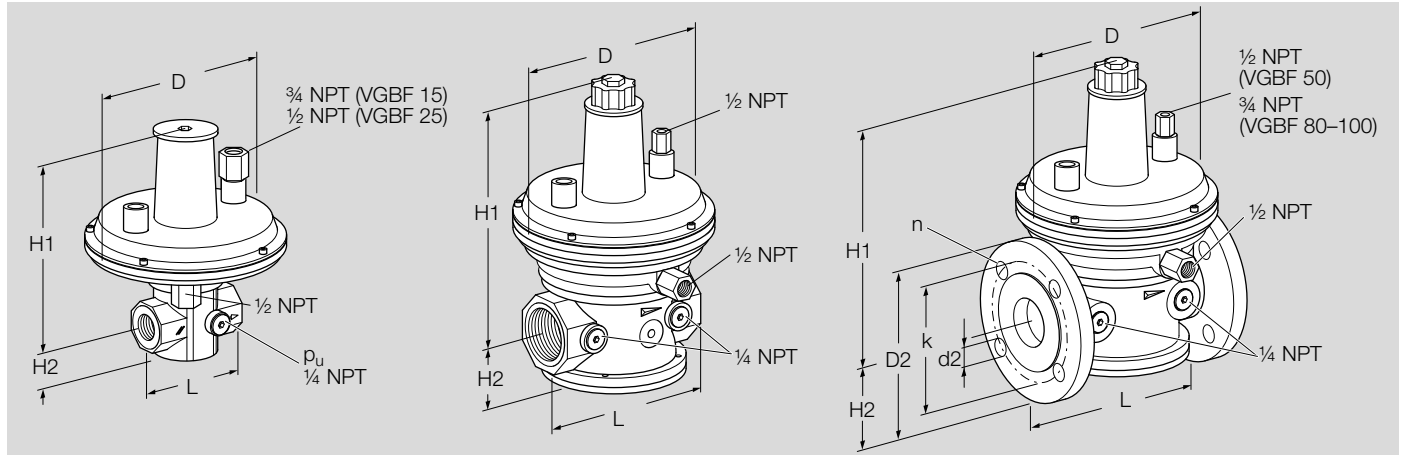
9.1 VGBF with Rp internal thread or with ISO flange



VGBF 15R, VGBF 25R, VGBF 40R, VGBF 40–150F

Type	DN	Connection	L [mm]	H1 [mm]	H2 [mm]	D [mm]	$p_{u \max.}$ [bar]	$p_{u \max.}$ [kPa]	D2 [mm]	k [mm]	d2 [mm]	n Number	Weight [kg]
VGBF 15R	15	Rp 1/2	70	151	24	132	4	400	–	–	–	–	0.9
VGBF 25R	25	Rp 1	90	250	33	190	1; 4	100; 400	–	–	–	–	1.9
VGBF 40R	40	Rp 1 1/2	150	260	56	190	1; 4	100; 400	–	–	–	–	2.9
VGBF 40F	40	40	200	260	75	190	0.5; 1; 4	50; 100; 400	150	110	18	4	4.8
VGBF 50F	50	50	230	316	83	240	0.5; 1; 4	50; 100; 400	165	125	18	4	7.7
VGBF 65F	65	65	290	412	89	260	0.5	50	185	145	18	4	12.0
VGBF 80F	80	80	310	446	100	310	0.5; 1; 4	50; 100; 400	200	160	18	8	16.1
VGBF 100F	100	100	350	501	115	396	0.5; 1; 4	50; 100; 400	229	180	18	8	26.0
VGBF 150F	150	150	480	573	150	520	0.5; 1	50; 100	285	240	22	8	46.5

9.2 VGBF.T with NPT internal thread or with ANSI flange



VGBF 15–25TN; VGBF 40–50TN; VGBF 50–100TA

Type	DN	Connection	L [inch]	H1 [inch]	H2 [inch]	D [inch]	P_u max. ["WC]	D2 [inch]	k [inch]	d2 [inch]	n Number	Weight [lbs]
VGBF 15TN	15	1/2 NPT	2.76	5.91	0.94	5.20	1.5					2.0
VGBF 25TN	25	1 NPT	3.54	9.84	1.30	7.48	0.4; 1.5					4.2
VGBF 40TN	40	1 1/2 NPT	5.91	10.24	2.20	7.48	0.4; 1.5					6.4
VGBF 50TN	50	2 NPT	7.17	12.44	2.72	9.45	0.2; 0.4; 1.5					12.6
VGBF 50TA	50	2 ANSI	9.06	12.44	3.01	9.45	0.2; 0.4; 1.5	6.50	4.75	0.75	4	17.0
VGBF 80TA	80	3 ANSI	12.20	17.56	3.78	12.20	0.2; 0.4; 1.5	7.50	6.00	0.75	4	35.5
VGBF 100TA	100	4 ANSI	13.78	19.72	4.53	15.59	0.2; 0.4; 1.5	9.02	7.50	0.75	8	57.3

10 Converting units

See www.adlatus.org

11 Maintenance cycles

At least once a year, at least twice a year in the case of biologically produced methane.

For more information

The Honeywell Thermal Solutions family of products includes Honeywell Combustion Safety, Eclipse, Exothermics, Hauck, Kromschroder and Maxon. To learn more about our products, visit ThermalSolutions.honeywell.com or contact your Honeywell Sales Engineer.

Elster GmbH
Strotheweg 1, D-49504 Lotte
T +49 541 1214-0
hts.lotte@honeywell.com
www.kromschroeder.com

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

