

Circulation pressure control and relief regulator VAR

Technical Information · GB
2.1.5 Edition 10.11l

- Circulation pressure control and relief regulator for gaseous media in all types of gas appliances
- High flow rate due to optimal dimensioning
- No purge line required
- Internal bypass



Table of contents

Circulation pressure control and relief regulator VAR1	
Table of contents	2
1 Application	3
1.1 Examples of application	4
1.1.1 Gas pressure booster	4
1.1.2 Gas pressure booster flowchart	4
2 Certification	5
3 Function	6
4 Flow rate	7
5 Selection	8
5.1 Type code	8
6 Project planning information	9
6.1 Installation	9
7 Technical data	10
7.1 Spring table	11
7.2 Dimensions	12
8 Maintenance cycles	13
Feedback	14
Contact	14

1 Application



VAR..R



VAR..F

Relief regulator VAR is suitable for maintaining constant pressures in gas appliances or for relieving brief pressure surges in control systems. By using the VAR, inadmissibly high pressures in vessels can be prevented.

Compressors and fans generate different outlet pressures in the case of different capacity demands. These fluctuations can be controlled by discharging a bypass flow from the outlet to the inlet of the compressor unit. Downstream consumers thus dispose of constant pressure over the entire capacity range.

1.1 Examples of application

1.1.1 Gas pressure booster

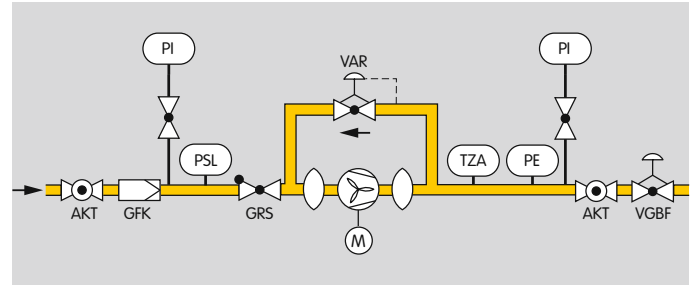


Industrial thermoprocessing equipment or combined heating and power plants in which the supply pressure is too low must be fitted with gas pressure boosters. The speed of the compressor and thereby the change in the outlet pressure or flow rate is controlled by a frequency converter. The frequency-controlled compressor allows a wide control range. The control system includes the safety interlocks (limits) with temperature and pressure monitor

The gas pressure boosters are designed for an operating pressure of up to 1 bar and an output capacity of

max. 50 kW in accordance with DVGW Code of Practice G 620.

1.1.2 Gas pressure booster flowchart



If the pressure downstream of the fan is too high, circulation pressure control regulator VAR opens and routes the medium back to the inlet area.

2 Certification

The regulator complies with the essential health and safety requirements of the corresponding chapters in Annex 2 of the Machinery Directive 2006/42/EC in conjunction with EN 13611.

Approval for Russia

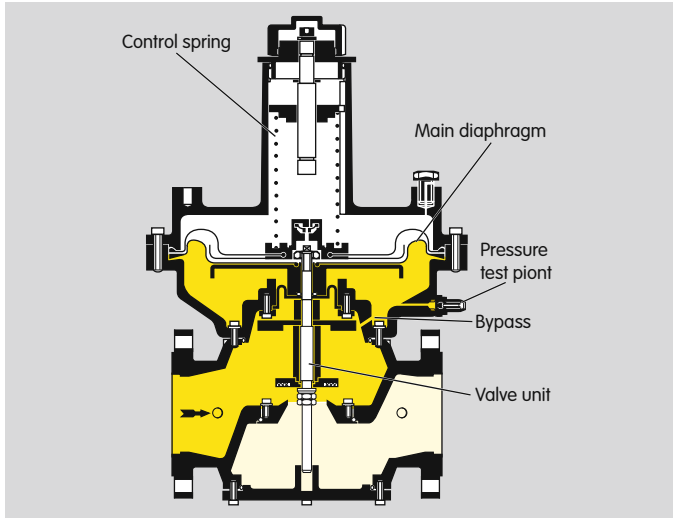


Certified by Gosstandart pursuant to GOST-TR.

Approved by Rostekhnadzor (RTN).

Scan of the approval for Russia (RUS) – see www.docuthek.com → Elster Kromschöder → Products → 02 Pressure regulators → Circulation pressure control and relief regulators VAR → Kind of document: Certificate → VAR B00093 (nationales Zertifikat Russland) (RUS)

3 Function



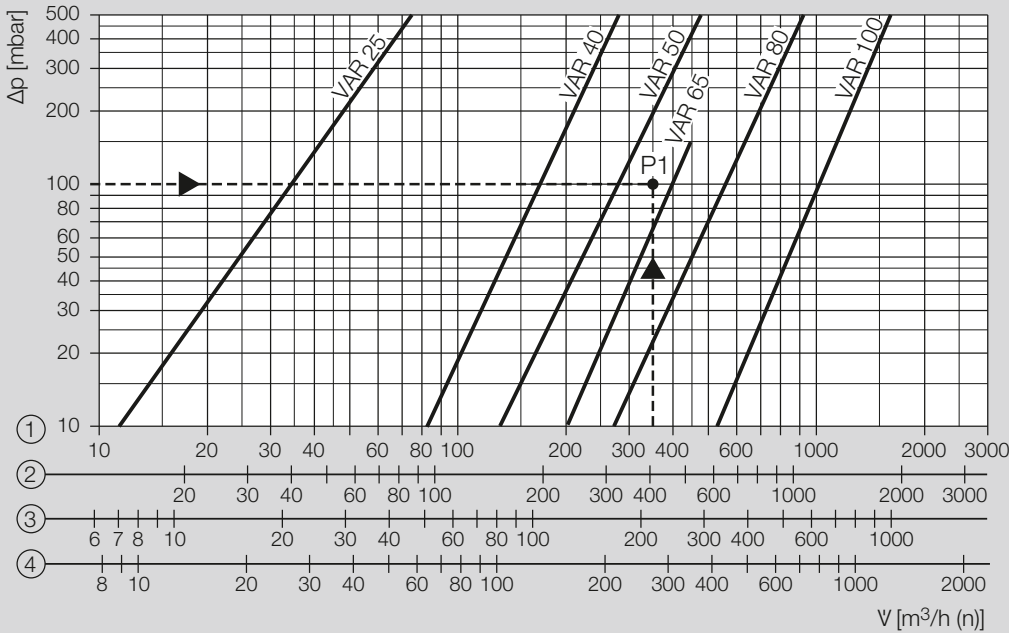
Circulation pressure control and relief regulator VAR is closed by a spring when no pressure is applied.

The gas flows from the inlet side into the space under the main diaphragm via the internal impulse bore. If the inlet pressure reaches the pressure set by the control spring, the diaphragm raises the valve unit. Regulator VAR opens and the gas can flow to the outlet.

If the inlet pressure has decreased due to the gas flowing out, the regulator closes.

A test nipple has been installed to measure the opening pressure p_{a5} .

4 Flow rate



- ① = natural gas (N), $dv = 0.62$
- ② = town gas (S), $dv = 0.45$
- ③ = LPG (F), $dv = 1.56$
- ④ = air (L), $dv = 1,00$

Reading instructions: should operating cubic metres (\check{V}_p) have been used in the flow rate diagram, instead of standard cubic metres (\check{V}_n), then the pressure loss read (Δp) must be multiplied by the absolute inlet pressure in bar ($1 + \text{positive pressure in bar}$).

Example: a circulation pressure control regulator should keep the outlet pressure of a gas pressure booster constant.

Medium: natural gas

Flow rate $V = 350 \text{ m}^3/\text{h}(\text{n})$

Opening pressure $p_{as} = 120 \text{ mbar}$

System inlet pressure: $p_{counter} = 20 \text{ mbar}$

The natural gas is discharged against the inlet pressure $p_{counter}$ of the system.

$$\Delta p = p_d - p_{counter}$$

$$\Delta p = 120 \text{ mbar} - 20 \text{ mbar} = 100 \text{ mbar}$$

The result is intersection P1 in the flow rate diagram.

The next largest regulator must be selected: VAR 65.

5 Selection

Typ	R	F	05	-1	-2
VAR 25	●	-	●	●	●
VAR 40	●	●	●	●	●
VAR 50	-	●	●	●	●
VAR 65	-	●	●	●	-
VAR 80	-	●	●	●	●
VAR 100	-	●	●	●	●

● = standard

Order example

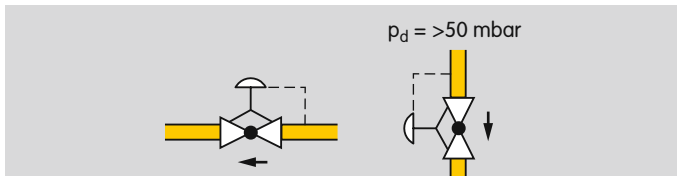
VAR 65F05-1

5.1 Type code

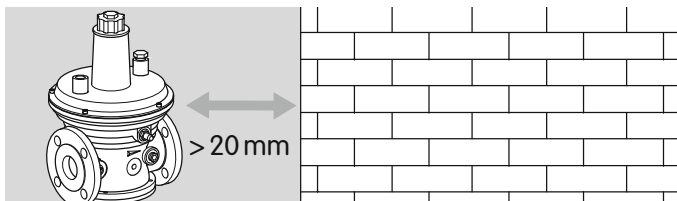
Code	Description
VAR	Circulation pressure control and relief regulator
25	Nominal size DN 25
40	DN 40
50	DN 50
65	DN 65
80	DN 80
100	DN 100
R	Rp internal thread
F	Flange to ISO 7005
05	$p_{u \max}$ 500 mbar
-1	Opening pressure p_{as} 10 – 150 mbar
-2	151 – 340 mbar

6 Project planning information

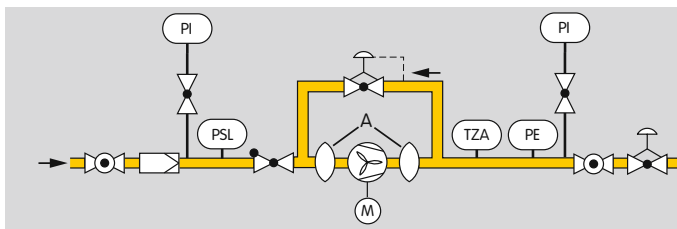
6.1 Installation



Installation position: spring dome in the vertical upright position, not upside down. With opening pressures of > 50 mbar: spring dome in the vertical upright position or tilted up to the horizontal, not upside down.



Regulator VAR must not be in contact with masonry. Minimum clearance 20 mm.



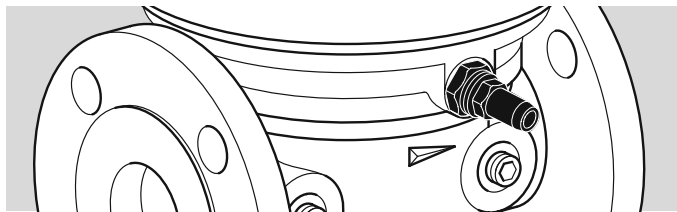
The use of bellows units or flexible tubes (A) allows for the installation in pipelines under little mechanical

stress and reduces the transmission of vibrations.

Sealing material and dirt, e.g. thread cuttings, must not be allowed to get into the regulator housing.

Install a filter upstream of every system.

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



The unit is delivered with a test nipple fitted to the side to measure the inlet pressure p_u or opening pressure p_{as} .

Circulation pressure control and relief regulators must be designed as small as possible to maintain good control characteristics, see page 7 (Flow rate). It may be necessary to expand the pipeline to avoid flow velocities of ≥ 30 m/s in pipelines.

7 Technical data

Gas types: town gas, natural gas, LPG (gaseous) and biologically produced methane (max. 0.02 %-by-vol. H₂S). The gas must be dry in all temperature conditions and must not contain condensate.

Inlet pressure $p_{u \max.}$: 500 mbar.

Ambient temperature: -15 to +60°C.

Internal thread: Rp to ISO 7-1,

Flanged connection: PN 16 to ISO 7005.

Housing: aluminium,
diaphragms: Perbunan,
valve seat: aluminium,
valve stem: aluminium,
valve disc: Perbunan.

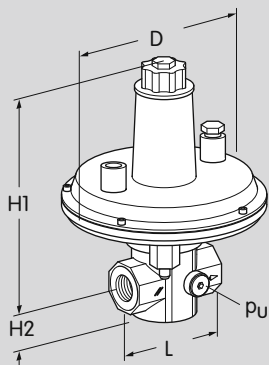
7.1 Spring table

The opening pressure p_{as} is adjusted by inserting different springs.

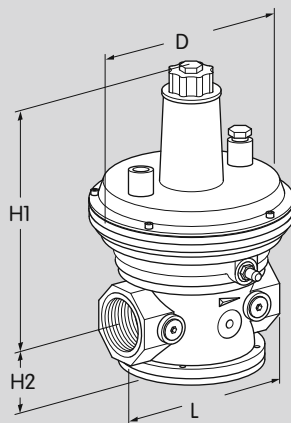
Opening pressure range p_{as} [mbar]	Marking	Order No.				
		VAR 25, VAR 40	VAR 50	VAR 65	VAR 80	VAR 100
10 - 25	red	75421971	75422041	75426170	75426240	75426320
26 - 40	yellow	75421980	75422051	75426180	75426250	75426330
41 - 55	green	75421990	75422061	75426190	75426260	75426340
56 - 70	blue	75422000	75422071	75426200	75426270	75426350
71 - 85	black	75422010	75422081	75426210	75426280	75426360
86 - 100	white	75422020	75422091	75426220	75426290	75426370
101 - 150	black/red	75438978	75438981	75446329	75438984	75438987
151 - 220	black/yellow	75438979	75438982	-	75438985	75438988
221 - 340	black/green	75438980	75438983	-	75438986	75438989

Dispatch complete with label for changed outlet pressure p_{as} .

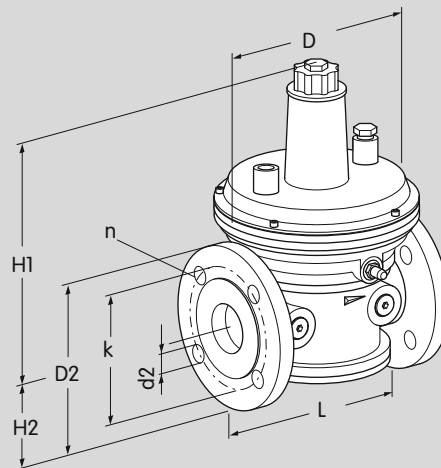
7.2 Dimensions



VAR 25R



VAR 40R



VAR 40 – 100F

Type	Connection	Inlet pressure $p_{u \text{ max.}}$ [mbar]	Dimensions [mm]							Number	Weight [kg]
			L	D	H1	H2	D2	k	d2		
VAR 25R	Rp 1	500	90	190	250	33	-	-	-	-	1.9
VAR 40R	Rp 1½	500	150	190	260	56	-	-	-	-	2.9
VAR 40F	DN 40	500	200	190	260	75	150	110	18	4	4.8
VAR 50F	DN 50	500	230	240	316	83	165	125	18	4	7.7
VAR 65F	DN 65	500	290	260	412	89	185	145	18	4	12.0
VAR 80F	DN 80	500	310	310	446	100	200	160	18	8	16.1
VAR 100F	DN 100	500	350	396	501	115	229	180	18	8	26.0

8 Maintenance cycles

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

Feedback

Finally, we are offering you the opportunity to assess this “Technical Information (TI)” and to give us your opinion, so that we can improve our documents further and suit them to your needs.

Clarity

- Found information quickly
- Searched for a long time
- Didn't find information
- What is missing?
- No answer

Comprehension

- Coherent
- Too complicated
- No answer

Scope

- Too little
- Sufficient
- Too wide
- No answer



Use

- To get to know the product
- To choose a product
- Planning
- To look for information

Navigation

- I can find my way around
- I got “lost”
- No answer

My scope of functions

- Technical department
- Sales
- No answer

Remarks

Contact

Elster GmbH
Postfach 2809 · 49018 Osnabrück
Strothweg 1 · 49504 Lotte (Büren)
Germany

Tel +49 541 1214-0
Fax +49 541 1214-370
info@kromschroeder.com
www.kromschroeder.com

The current addresses of our international agents are available on the Internet:
www.kromschroeder.de/Weltweit.20.0.html?&L=1

We reserve the right to make technical modifications in the interests of progress.
Copyright © 2016 Elster GmbH
All rights reserved.

