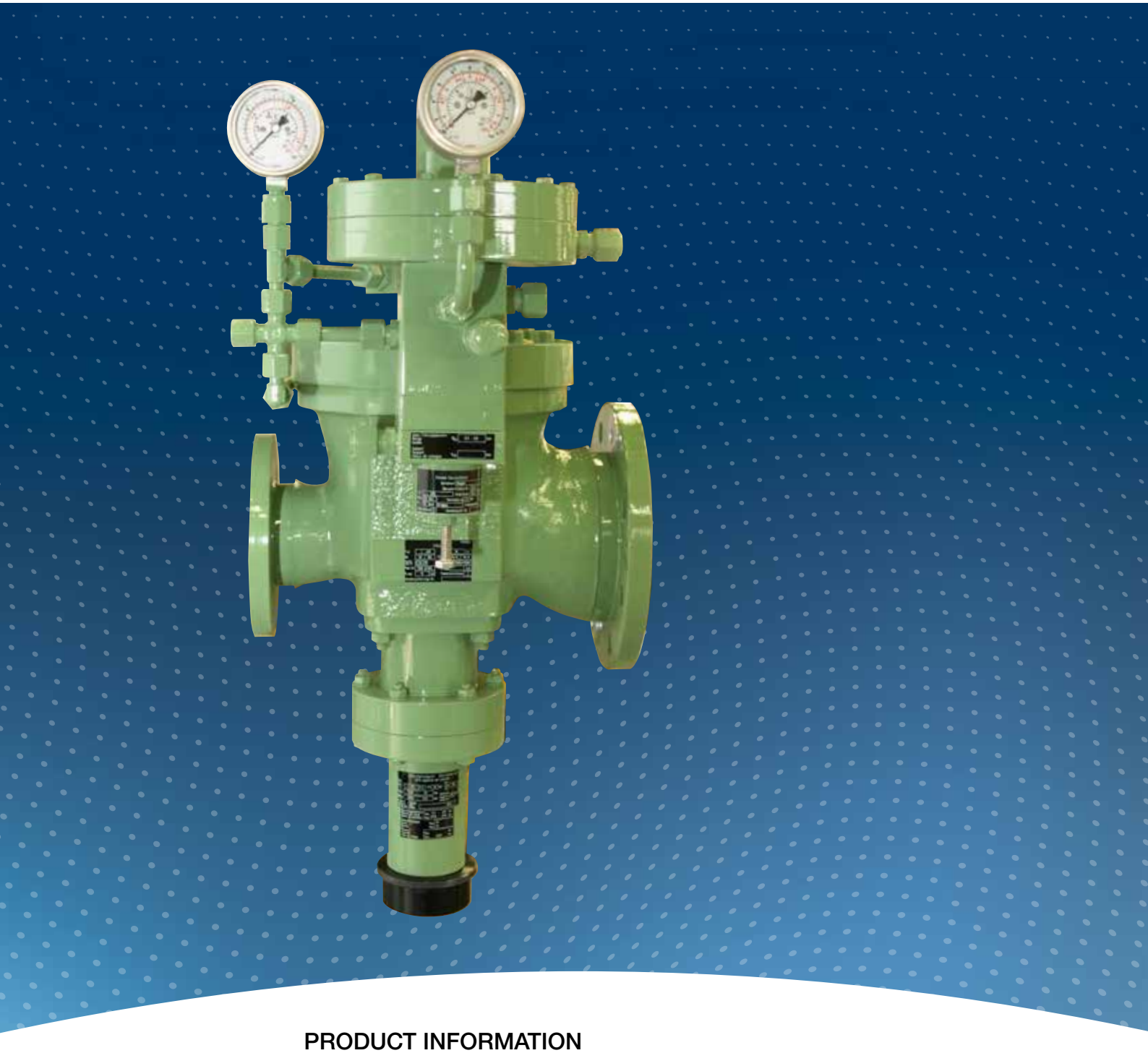
Gas Pressure Regulator HON 402



PRODUCT INFORMATION

Serving the Gas Industry Worldwide

Honeywell

Applications

- Device for municipal consumers, power plants and industrial stations
- Suitable for gases in accordance with DVGW Worksheet G 260 and neutral, non-aggressive gases; other gases on request

Characteristics

- Large inlet pressure range
- Diaphragm valve acts as final control element
- Available with safety shut-off valve (SSV)
- CE mark according to the Pressure Equipment Directive PED/GAD
- Made up of few parts, easy to maintain, and quiet operation
- Approved as an equipment component of gas consumption devices in accordance with the EC Gas Equipment Directive

Technical Specifications				
Max. permissible pressure PS	25 bar integral overpressure protection (IS) with regulator HON 625 40 bar integral overpressure protection (IS) with regulator HON 630/630-1			
	Setpoint spring			
Regulator HON 625	**Spring no.**	**Wire Ø in mm**	**Colour coding**	**Specific setting range W_{ds}**
LP measuring unit	1	2.5	cream white	0.02 bar to 0.06 bar
	2	3.5	green	0.04 bar to 0.18 bar
	3	4	red	0.07 bar to 0.35 bar
	4	5	blue	0.3 bar to 0.5 bar
HP measuring unit	5	4	red	0.3 bar to 1 bar
	6	5	blue	0.5 bar to 2 bar
	7	5.5	no colour	1 bar to 3.5 bar
	8	6	silver	2 bar to 5 bar
Regulator HON 630	**Spring no.**	**Wire Ø in mm**	**Colour coding**	**Specific setting range W_{ds}**
(only in combination with HON 720/K6 and HON 721) (external regulator, two-stage version)	0	4.5	black	0.3 to 1
	1	3.6	blue	0.5 to 2
	2	5.6	yellow	1 to 5
	3	6.3	brown	2 to 10
	4	7	red	5 to 20
	5	8	green	10 to 40
Load limiting stage		5	green	5 to 15 automatic: above p_d
Regulator HON 630-1	**Spring no.**	**Wire Ø in mm**	**Colour coding**	**Specific setting range W_{ds}**
(only in combination with HON 720/K6 and HON 721) (external regulator, single-stage version, suitable for inlet pressure fluctuations < 15 bar)	0	4.5	black	0.3 to 1
	1	3.6	blue	0.5 to 2
	2	5.6	yellow	1 to 5
	3	6.3	brown	2 to 10
	4	7	red	5 to 20
	5	8	green	10 to 40
Minimum pressure drop Δp_{min}	Difference between inlet and outlet ≥ Δp 0.5 bar			
Material				
Main valve housing	Ductile iron GJS / cast steel GS			
Internal parts of main valve	Steel / Al alloy			
Pilot	Steel / Al alloy			
SSV control device	Steel / Al alloy			
Diaphragms	Rubber plastics (NBR, ECO)			
Seals	Rubber plastics (NBR)			

Technical data			
Valve specifications	Inlet / outlet		(Valve) Flow rate coefficient KG* in (m³/h)/bar
HON 402 with $DN_u = DN_d$ (without outlet expansion)	DN 25 / DN 25	(only ductile iron GJS)	350
	DN 50 / DN 50		1300
	DN 80 / DN 80		3500
	DN 100 / DN 100		5200
Type of connection:			
Body made of ductile iron GJS	DIN flanges PN 16, PN 25, Class 150 accor. to ANSI 16.5		
Body made of cast steel GS	DIN flanges PN 16, PN 25, PN 40 and Class 150 and Class 300 according to ANSI 16.5		
HON 402 with outlet expansion	Inlet / outlet		(Valve) Flow rate coefficient KG* in (m³/h)/bar
	DN 50 / DN 100		1500
	DN 80 / DN 150		3800
	DN 100 / DN 200		5500
Type of connection: Body made of cast steel GS	DIN flanges PN 16, PN 25, PN 40 and Class 150 and Class 300 accor. to ANSI 16.5		
Accuracy class and closing pressure group	p_d range	Accuracy class AC	Lock-up pressure class SG
HON 625	0.02–0.03 bar	10	30
	> 0.03–2.5 bar	5	10
	> 2.5–5 bar	1	10
HON 630	0.3–1 bar	20	30
	> 1–3 bar	5	10
	> 3–5 bar	5	10
	> 5–40 bar	2.5	10
HON 630-1	0.3–1 bar	**20	30
	> 1–3 bar	20	30
	> 3–5 bar	10	20
	> 5–40 bar	5	10
Closing pressure zone group	SZ 2.5		
Environmental and operating temperature range (DIN EN 334)	Class 2: –20 °C to +60°C		
Strength – leak tightness – functionality	according to EN 334 and EN 14382		
CE-PIN. no.	CE-0085AT0082		
Explosion protection	All mechanical components of this device are without potential ignition sources and / or hot faces. They are not subject to ATEX 95 (94/9/EC). All electronic accessories, on the other hand, meet ATEX requirements.		
CE registration according to PED and GAD	Honeywell CE 0085 / Honeywell GAD		

*) for natural gas with d = 0.64 ($\rho_n \approx$ 0,83 kg/m³) and t_u = 15 °C gas inlet temperature
**) if Δp_u is < 8 bar

Safety shut-off valve applications

A safety shut-off valve can be pre-installed or retrofitted in the main valve body. Then the gas pressure regulator HON 402 is equipped with the SSV systems HON 720 or HON 721 depending on the necessary actuation pressures.

Control device		Setpoint spring			Overpressure relief p_{dso}*		Underpressure relief p_{dsu}*		
		No.	Colour	Wire Ø in mm	Upper setting range W_{dso} in bar	Min. re-engage differential between upper response pressure and normal operating pressure Δp_{wo} in bar	Lower setting range W_{dsu} in bar	Min. re-engage differential between lower response pressure and normal operating pressure Δp_{wu} in bar	Accuracy group AG**
SSV System HON 720 for Nominal width DN 25 (p_{max} = 16 bar)									
K1a	HON 673	1	yellow	2.5	0.05 to 0.1	0.03			10/5
		2	light red	3.2	0.08 to 0.25	0.05			10/5
		3	dark red	3.6	0.2 to 0.5	0.1			5/2.5
		4	white	4.75	0.5 to 1.5	0.2			5/2.5
		5	light blue	1.1			0.01 to 0.015	0.012	20
		6	white	1.2			0.014 to 0.04	0.03	10/5
		7	black	1.4			0.035 to 0.12	0.06	5
K2a		2	light red	3.2	0.4 to 0.8	0.1			10/5
		3	dark red	3.6	0.6 to 1.6	0.2			10/5
		4	white	4.75	1.5 to 4.5	0.3			5/2.5
		5	light blue	1.1			0.06 to 0.15	0.05	10/5
		6	black	1.4			0.12 to 0.4	0.1	5
SSV System HON 720 for Nominal width dn 50 (p_{max} = 25 bar)									
K4	HON 674	2	light red	3.2	0.04 to 0.1	0.02			5/2.5
		3	dark red	3.6	0.08 to 0.25	0.03			2.5
		4	black	4.5	0.2 to 0.5	0.06			2.5/1
		5	light blue	1.1			0.005 to 0.02	0.01	20/5
		6	black	1.4			0.015 to 0.06	0.02	5
K5		3	dark red	3.6	0.2 to 0.8	0.1			2.5
		4	black	4.5	0.6 to 1.5	0.2			2.5/1
		5	light blue	1.1			0.015 to 0.05	0.03	20/5
		6	black	1.4			0.04 to 0.12	0.06	5
K6		3	dark red	3.6	0.6 to 2	0.2			2.5
		4	black	4.5	1.5 to 4.5	0.4			2.5/1
		5	light blue	1.1			0.04 to 0.12	0.06	20/5
		6	black	1.4			0.12 to 0.3	0.12	5

*) Please note: When using control units for both overpressure and underpressure release, make sure that the pressure deviation between the two setpoints p_{dso} is at least 10 % greater than the sum of the two values p_{dsu} Δp_{wo} and Δp_{wu}:

$$p_{dso} - p_{dsu} \geq 1.1 \times (\Delta p_{wo} + \Delta p_{wu})$$

**) The higher AG group applies to the first half, the lower AG group to the second half of the setting range.

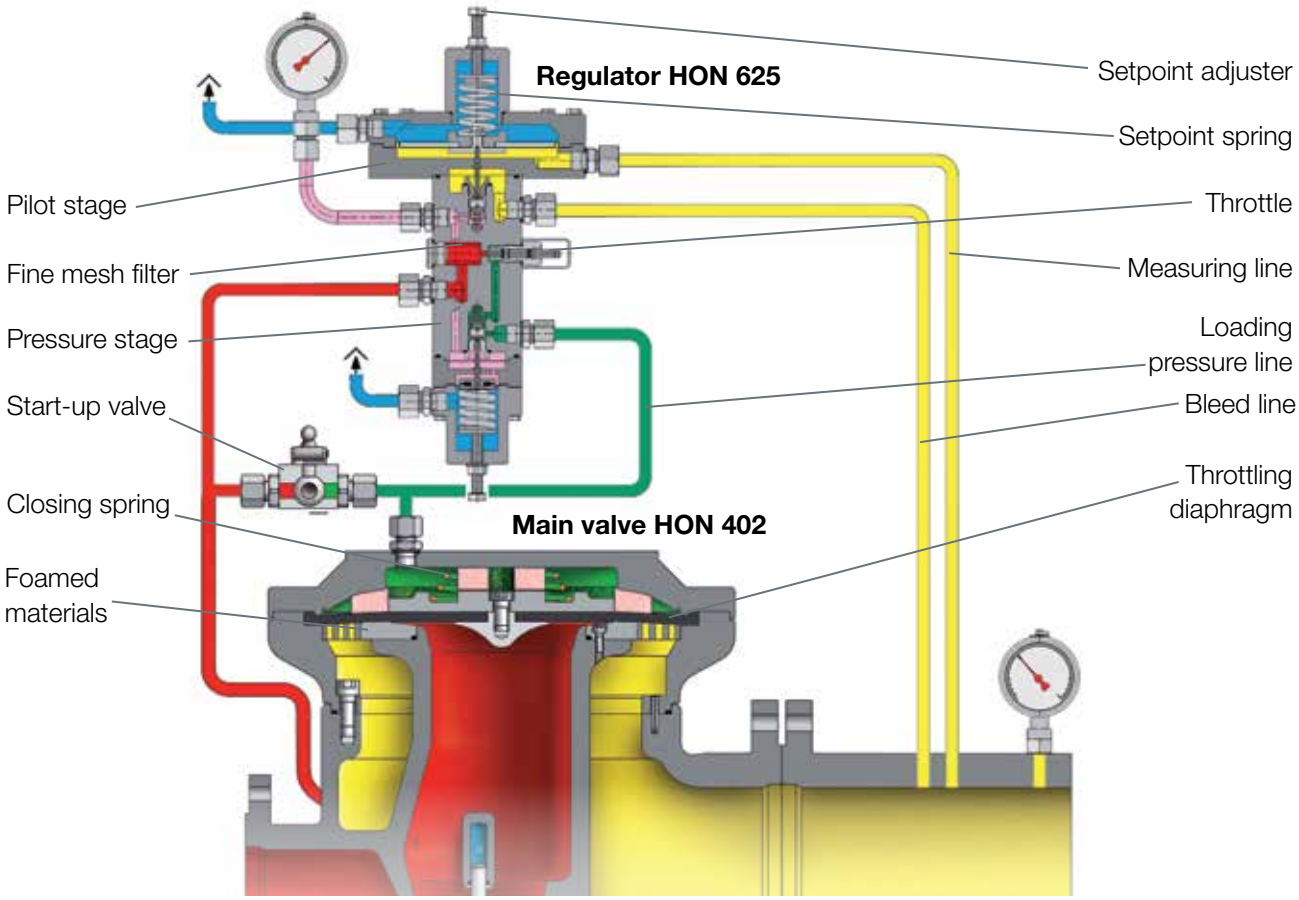
SSV System HON 721 for Nominal width DN 50 and larger (p_{max} = 40 bar)										
		Setpoint spring			Overpressure relief p_{dso}*		Underpressure relief p_{dsu}*		
Control device		No.	Colour	Wire Ø in mm	Upper setting range W_{dso} in bar	Min. re-engage differential between upper response pressure and normal operating pressure Δp_{wo} in bar	Lower setting range W_{dsu} in bar	Min. re-engage differential between lower response pressure and normal operating pressure Δp_{wu} in bar	Accuracy group AG**
K10a	HON 672	1	yellow	2.5	0.05 to 0.1	0.03			10/5
		2	light red	3.2	0.08 to 0.25	0.05			10/5
		3	dark red	3.6	0.2 to 0.5	0.1			5/2.5
		4	white	4.8	0.4 to 1.5	0.25			5/2.5
		5	light blue	1.1			0.01 to 0.015	0.012	20
		6	white	1.2			0.014 to 0.04	0.03	20/5
		7	black	1.4			0.035 to 0.12	0.06	5
K11a/1		1	light red	3.2	0.4 to 0.8	0.1			10/5
		2	dark red	3.6	0.6 to 1.6	0.2			10/5
		3	white	4.75	1.5 to 4.5	0.3			5/2.5
		4	light blue	1.1			0.06 to 0.15	0.05	20/5
		5	black	1.4			0.12 to 0.4	0.08	5
		6	bright red	2.25			0.35 to 1	0.1	5
K11a/2		3	white	4.75	2.5 to 8	0.5			10/5
		6	bright red	2.25			0.8 to 2.2	0.4	20/5
K16[1]	HON 670	0	blue	3.2	0.8 to 1	0.1			2.5
		1	black	4.5	1 to 5	0.2			2.5/1
		2	grey	5	2 to 10	0.4			1
		3	brown	6.3	5 to 20	0.8			1
		4	red	7	10 to 40	1.2			1
K17[1]	HON 671	2	grey	5			4 to10	0.4	5
		3	brown	6.3			5 to 20	0.8	5
		4	red	7			10 to 40	1.2	5

*) Please note: When using control units for both overpressure and underpressure release, make sure that the pressure deviation between the two setpoints p_{dso} is at least 10% greater than the sum of the two values p_{dsu} Δp_{wo} *and* Δp_{wu}:

$$p_{dso} - p_{dsu} \geq 1.1 \times (\Delta p_{wo} + \Delta p_{wu})$$

**) The higher AG group applies to the first half, the lower AG group to the second half of the setting range.
[1]) Control devices K16 and K17 can also be used in combination.

Application example: HON 402 with outlet expansion and HON 625

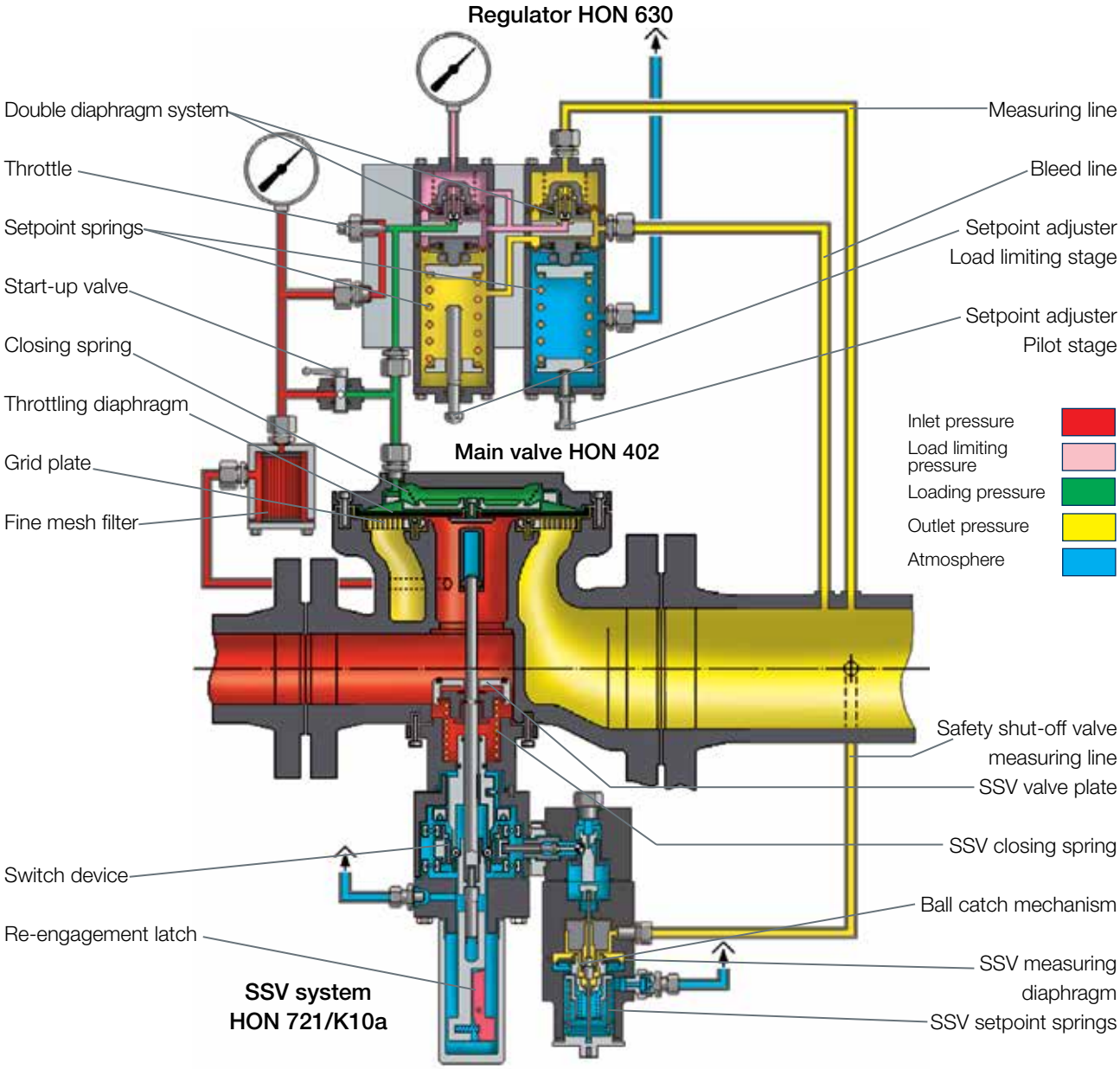


Flow diagram of the gas pressure regulator HON 402 with HON 625

- Inlet pressure
- Outlet pressure
- Load limiting pressure
- Loading pressure
- Atmosphere

The HON 402 gas pressure regulator unit is used to keep the outlet pressure of a gaseous medium at a constant level independent of any disturbance variables such as changes in inlet and/or outlet pressure throughout the controlled system.
The HON 402 is composed of the main valve and the functional units 'regulator' and 'safety shut-off valve (SSV)'. The external regulators (HON 630/HON 630-1/HON 625) are connected to the main valve via control lines. An upstream fine mesh filter is switched in front of the pilot to protect it from impurities. The SSV can also be retrofitted. Thanks to the fact that it is made up of only a few parts, the actuator is particularly easy to maintain: its only wearing part, the throttling diaphragm, can be subjected to a quick inspection by simply removing the upper part of the housing without the need to remove the main valve body from the controlled system. The SSV functional unit can also be easily removed from the valve body by loosening the connecting screws.
The final control element is designed as a diaphragm valve. The diaphragm supports itself on the grid plate fitted with holes. An all-around sealing edge is located in front of the relief slots. A closing spring generates the necessary closing force for bubble-tight shut-off.
A metal foam ring can be installed under the grid plate for noise reduction. Then a KG value reduced by approx. 15 % is to be expected.

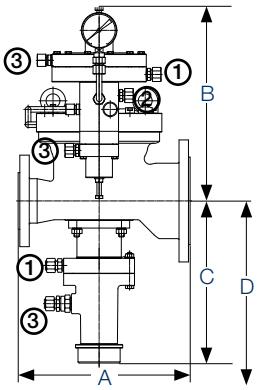
Application example: HON 402 with outlet expansion, with regulator HON 630 and SSV system HON 721/K10a

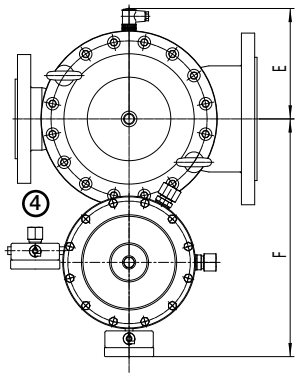


Flow diagram of the gas pressure regulator HON 402 with regulator HON 630 and SSV system HON 721/K10a

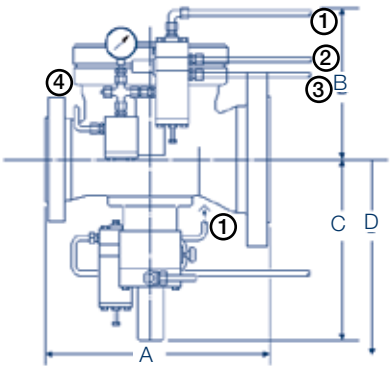
The outlet pressure you want to control is fed to the controller via the measuring line. The double diaphragm system inside the controller captures the actual value of the outlet pressure as a force acting on the measuring diaphragm and compares it to the setpoint force of the setpoint spring. If this comparison reveals any deviations from the controlled pressure, the device will adjust the set pressure by changing the opening position of the throttling diaphragm in an effort to bring the outlet pressure (actual value) in line with the set point. Thanks to its use of a diaphragm construction as a final control element, the HON 402 manages to operate soundly even when handling only low flow rates.
The device will seal tightly when consumption is zero.
The gas pressure regulator HON 402 must be equipped with a start-up valve. The start-up valve is provided for faster pressure equalisation at the throttle diaphragm with application of the inlet pressure.
The gas pressure regulator HON 402 can be equipped with the optional SAV functional units system HON 720 or HON 721. Both SSVs consist of an actuator with integrated pressure equalisation valve, tripping device and control device. The control devices have spring-loaded compensators that are arranged for the upper and lower shut-off pressures. The actuator of the function unit ‘safety shut-off valve (SSV)’ arranged on the inlet-side closes when the adjusted response pressure is exceeded or undercut.
Refer to the SSV control device brochure pages for the functional description, adjustment possibilities and handling of the re-engage.

Example combinations

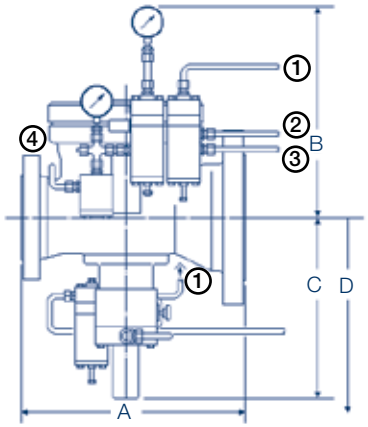




Inlet expansion width DN 25 and larger, with regulator HON 625 and SSV system HON 720 (Control device K1a, K2a or K4/K5/K6)



Inlet expansion width DN 50 and larger, with regulator HON 630-1 and SSV system HON 721 (Control device K10a, K11a/1, K11a/2, K16, K17)



Inlet expansion width DN 50 and larger, with regulator HON 630 and SSV system HON 721 (Control device K10a, K11a/1, K11a/2, K16, K17)

Dimensions

Nominal width	Valve body material	Dimensions in mm										
		A Pressure stage		B Pilot		C SSV		D Lengths required for removal		E	F	
		PN 16, PN 25, PN 40, ANSI 150	ANSI 300 p_{umax}=40 bar	HON 625	HON 630/630-1	HON 720	HON 721	HON 720	HON 721	HON 625/ 630/630-1	HON 625	HON 630/630-1
DN 25*	GJS**	184		~350	370	180		260		~120	~325	~230
DN 50	GJS**	254		~340	330	300	360	430	490	~170	~325	~230
DN 80	GJS**	298		~440	560	330	390	490	530	~190	~400	~310
DN 100	GJS**	352		~440	580	330	390	490	530	~190	~400	~310
DN 50	GS	254	267	~400	400	300	360	430	490	~145	~325	~230
DN 80	GS	298	318	~480	620	330	390	490	530	~190	~400	~310
DN 100	GS	352	368	~500	630	330	390	490	530	~190	~400	~310
DN 50/100	GS	310		~350	350	300	360	430	490	~145	~325	~230
DN 80/150	GS	400		~480	620	330	390	490	530	~190	~400	~310
DN 100/200	GS	430		~480	630	330	390	490	530	~200	~400	~310

*) DN 25 with SSV HON 720 (Control device K1a and K2a) only up to p_{umax} = 16 bar
**) Body made of GJS not available in PN 40

Gas Pressure regulator HON 402

Connection and weight

Connection			
HON 402 with regulator HON 625			
Item	**Description**	**Line**	**Pipe connection according to DIN EN ISO 8434-1 (DIN 2353) for pipe diameters**
①	**Measuring line connection**	at outlet pressure p_d	Ø 12, M 14 x 1.5
②	**Discharge line connection**	at outlet pressure p_d	Ø 12, M 14 x 1.5
③	**Vent line connection**	to atmosphere	Ø 12, M 14 x 1.5*
④	**Inlet pressure line connection**	at inlet pressure p_u	Ø 10, M 14 x 1.5
	Loading pressure line connection	at main valve	Ø 10, M 14 x 1.5
HON 402 with regulator HON 630/HON 630-1			
Item	**Description**	**Line**	**Pipe connection according to DIN EN ISO 8434-1 (DIN 2353) for pipe diameters**
①	**Measuring line connection**	at outlet pressure p_d	Ø 12, M 14 x 1.5
②	**Discharge line connection**	at outlet pressure p_d	Ø 12, M 14 x 1.5
③	**Vent line connection**	to atmosphere	Ø 12, M 14 x 1.5*
Item	**Description**	**Line**	**Pipe connection according to DIN EN ISO 8434-1 (DIN 2353) for pipe diameters**
SSV unit HON 720 and HON 721			
①	**Measuring line connection**	at outlet pressure p_d	Ø 12, M 14 x 1.5
③	**Vent line connection**	to atmosphere	Ø 12, M 14 x 1.5

*) or vent valve HON 915

Weight							
Nominal width	DN 25	DN 50	DN 80	DN 100	DN 50 / 100	DN 80 / 100	DN 100 / 200
Weight in kg (approx.)	30	45	90	105	63	124	144

HON 402 - 50/100 - K4 / F - 625 - So

Type | Nominal width | SSV control device | Triggering / remote indication | Regulator type | Special design

Size/Nominal width	
Size of device	Nominal width DN
without outlet expansion	25/25 50/50 80/80 100/100
with outlet expansion	50/100 80/150 100/200

Safety shut-off valve (SSV)			
Safety shut-off valve (SSV) for nominal width 25 Setting range in bar			
W_{do}	W_{du}	p_{max}	**Control device**
0.05 to 1.5	0.01 to 0.12	16 bar	K1a
0.4 to 4.5	0.06 to 0.4	16 bar	K2a
Safety shut-off valve (SSV) for nominal widths – without outlet expansion DN 50, DN 80, DN 100 – with outlet expansion DN 50/100, DN 80/150, DN 100/200 Setting range in bar			
W_{do}	W_{du}	p_{max}	**Control device**
0.04 to 0.5	0.005 to 0.06	25 bar	K4
0.2 to 1.5	0.015 to 0.12	25 bar	K5
0.6 to 4.5	0.04 to 0.3	25 bar	K6
0.05 to 1.5	0.01 to 0.12	40 bar	K10a
0.4 to 4.5	0.06 to 1	40 bar	K11a/1
2.5 to 8	0.8 to 2.2	40 bar	K11a/2
0.8 to 40		40 bar	K16*
	4 to 40	40 bar	K17*

Triggering and Remote indication		
Optional: **SSV remote indication** with	Current supply Current failure (only with HON 721)	E1 E2
Optional: **SAV manual triggering**	for HON 720: Push button valve HON 912 for HON 721: included in the system	HA
Optional: **Electrical remote indication** 'OPEN / CLOSED' SSV valve position		F

Regulator		
Description	Output pressure range in bar	Regulator type
HON 625	0.02 to 5	625
HON 630	0.3 to 40	630
HON 630-1	0.3 to 40 (Δp_u = < 15 bar)	630-1

SPECIAL DESIGN	
Special design (must be explained in more detail)	So

*) Control devices K16 and K17 can also be used in combination.

Figures and representations are only examples and may deviate from the actual scope of supply.

For More Information

To learn more about Honeywell's Advanced Gas Solutions, visit www.honeywellprocess.com or contact your Honeywell account manager

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