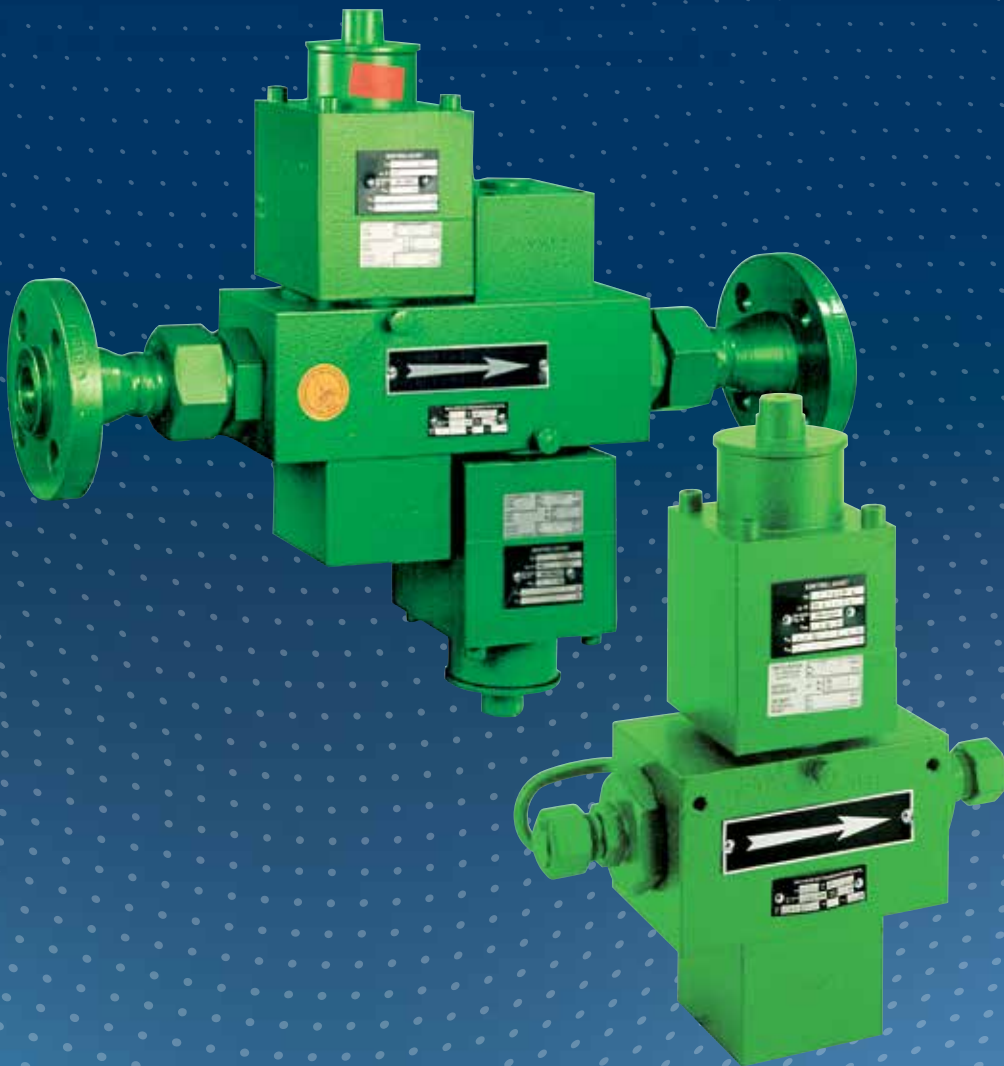


Safety SHUT-OFF Valve HON 703 / HON 704



PRODUCT INFORMATION

**Serving the Gas Industry
Worldwide**

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Safety Shut-Off Valve HON 703 / HON 704

Applications, characteristics, technical data

Applications

- Main safety device in gas pressure regulating systems in municipal consumers, industrial stations and for individual consumers
- Also suitable for low-load rails in larger gas pressure control systems
- Can be used for natural gas and all non-aggressive gases

Characteristics

- HON 703: Two independent safety shut-off devices in one valve body (tandem SSV)
- HON 704: Single SSV
- Compact and simple construction
- Easy to maintain thanks to exchangeable functional groups (plug-in assembly)
- Optional equipment with control devices K 1a, K 2a, K 16, K 17, K 18
- Pressure equalisation via ball valve or push button valve HON 913

TECHNICAL DATA	
Max. operating pressure p_{max} :	up to 100 bar (depending on connection type)
Valve seat diameter	25 mm
Type of connection	Inlet/outlet: Screwed pipe connection without brazing according to DIN 2353, PN 100 for outside pipe diameter 10, 12, 16, 18, 22, 25, 28, 38 and 42 mm Flange according to DIN PN 25 and PN 40, ANSI 300 and 600 with transition pieces having nominal widths DN 25, 40 and 50
Material	Valve body Aluminium alloy or steel Control device housing Aluminium alloy Internal parts Stainless steel, brass, steel Diaphragms, seals NBR (rubber-like plastic)
Temperature range class 2	-20 °C to +60 °C
Response time	0.1–0.3 sec
Supplemental fixture	– Electrical release with application of current – Electrical position indicator – Manual release – Screw-in port for combination with HON 200 (E 42) and HON 201 (E 18)
Function and strength	DIN EN 14382 (DIN 3381)
DIN DVGW registration no.	HON 703: NG-4303AN0197, HON 704: NG-4303AN0196

ADJUSTMENT RANGE OF CONTROL DEVICES								
Control device	Setpoint spring			Overpressure		Underpressure		Accuracy group**
	No.	Colour	Wire ø in mm	Special adjustment range	Min. re-engage differential between response pressure and normal operating pressure*	Special adjustment range	Min. re-engage differential between response pressure and normal operating pressure*	
				W _{dso} (bar)	Δp _{wO} (bar)	W _{dsu} (bar)	Δp _{wU} (bar)	
K1a	1	yellow	2.5	0.050–0.100	0.030			10/5
	2	light red	3.2	0.100–0.250	0.050			10/5
	3	dark red	3.6	0.200–0.500	0.100			5/2.5
	4	white	4.75	0.400–1.500	0.250			5/2.5
	5	light blue	1.1			0.010 – 0.015	0.012	15
	6	white	1.2			0.014 – 0.040	0.030	15/5
	7	black	1.4			0.035 – 0.120	0.060	5
K2a	1	light red	3.2	0.400–0.800	0.100			10/5
	2	dark red	3.6	0.800–1.600	0.200			10/5
	3	white	4.75	1.500–4.500	0.300			5/2.5
	4	light blue	1.1			0.060 – 0.150	0.050	15/5
	5	black	1.4			0.120 – 0.400	0.080	5
K16	0	blue	3.2	0.800–1.500	0.100			2.5
	1	black	4.5	1.000–5.000	0.200			2.5/1
	2	grey	5.0	2.000–10.00	0.400			1
	3	brown	6.3	5.000–20.00	0.800			1
K17	4	red	7.0	10.00–40.00	1.200			1
	2	grey	5.0			2.000 – 10.00	0.400	5
	3	brown	6.3			5.000 – 20.00	0.800	5
K18	4	red	7.0			10.00 – 40.00	1.200	5
	1		9.0	20.00 – 90.00	1.500			1

*) Please note: When using control units for both overpressure and underpressure release, the difference between the two setpoints p_{SO} and p_{SU} must be at least 10% greater than the sum of the re-engagement differences Δp_{wO} and Δp_{wU}.

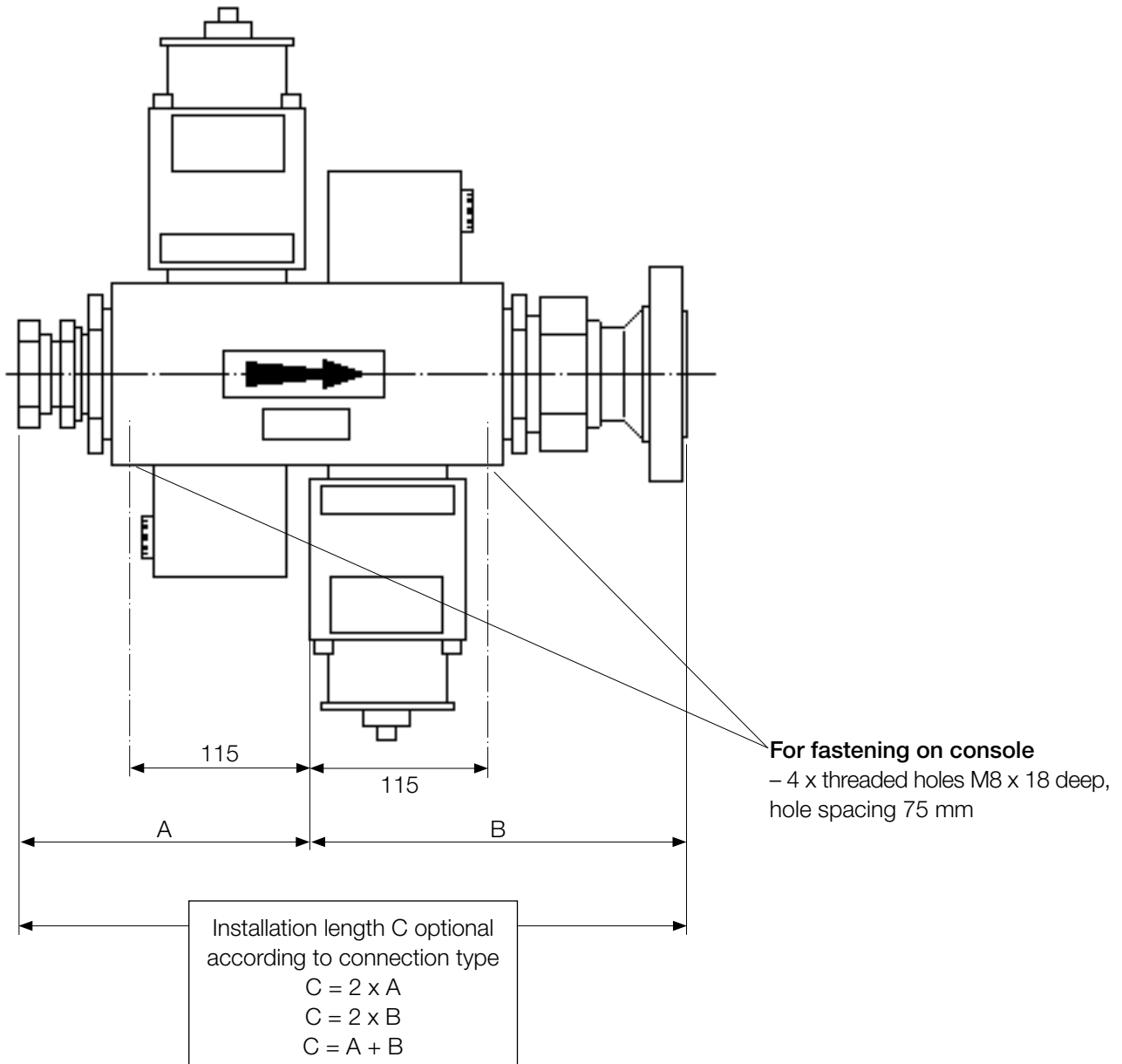
$$p_{dso} - p_{dsu} \geq 1.1 (\Delta p_{wO} + \Delta p_{wU})$$

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

Safety Shut-Off Valve HON 703 / HON 704

Dimensions

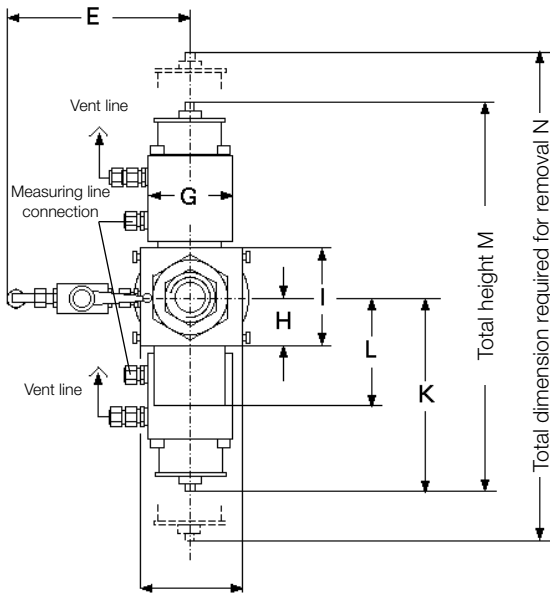
HON 703 dimensions



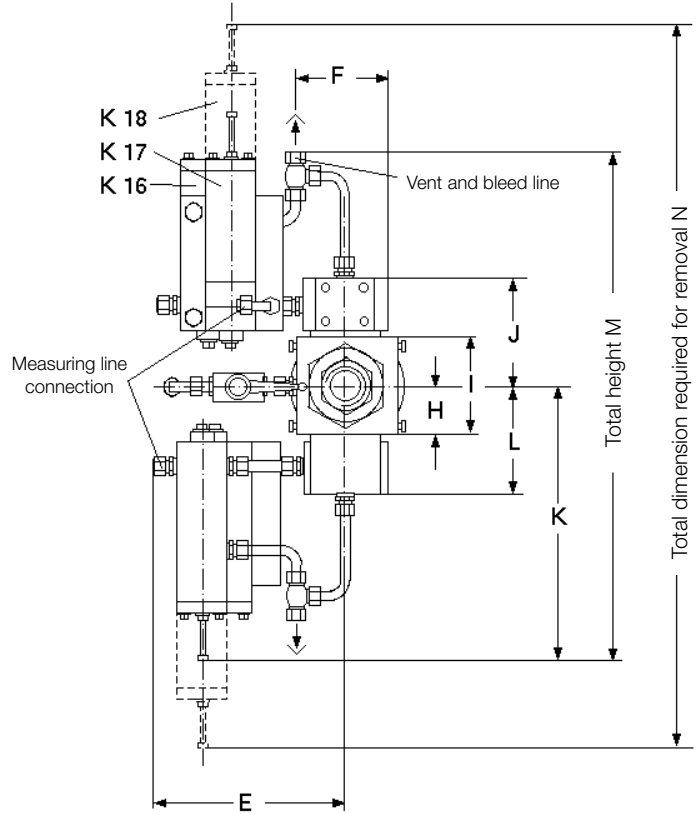
CONNECTIONS						
Pipe connection A*			Flange connection B			
Description	Pipe dimension	A in mm.	Pressure stage	B in mm		
				DN 25	DN 40	DN 50
E 10	10 x 1.5	168	PN 25 and PN 40	236	236	236
E 12	12 x 1.5	164				
E 16	16 x 1.5	174				
E 18	18 x 1.5	168	ANSI 300 RF/RJ	261	260	266
E 22	22 x 2	170				
E 25	25 x 3	184				
E 28	28 x 2	171	ANSI 600 RF/RJ	261	266	266
E 38	38 x 5	178				
E 42	42 x 3	163				

* Pipe screw connection without brazing with compression joint according to DIN 2353

Version with control device K1a/K2a



Version with control device K16/K17/K18



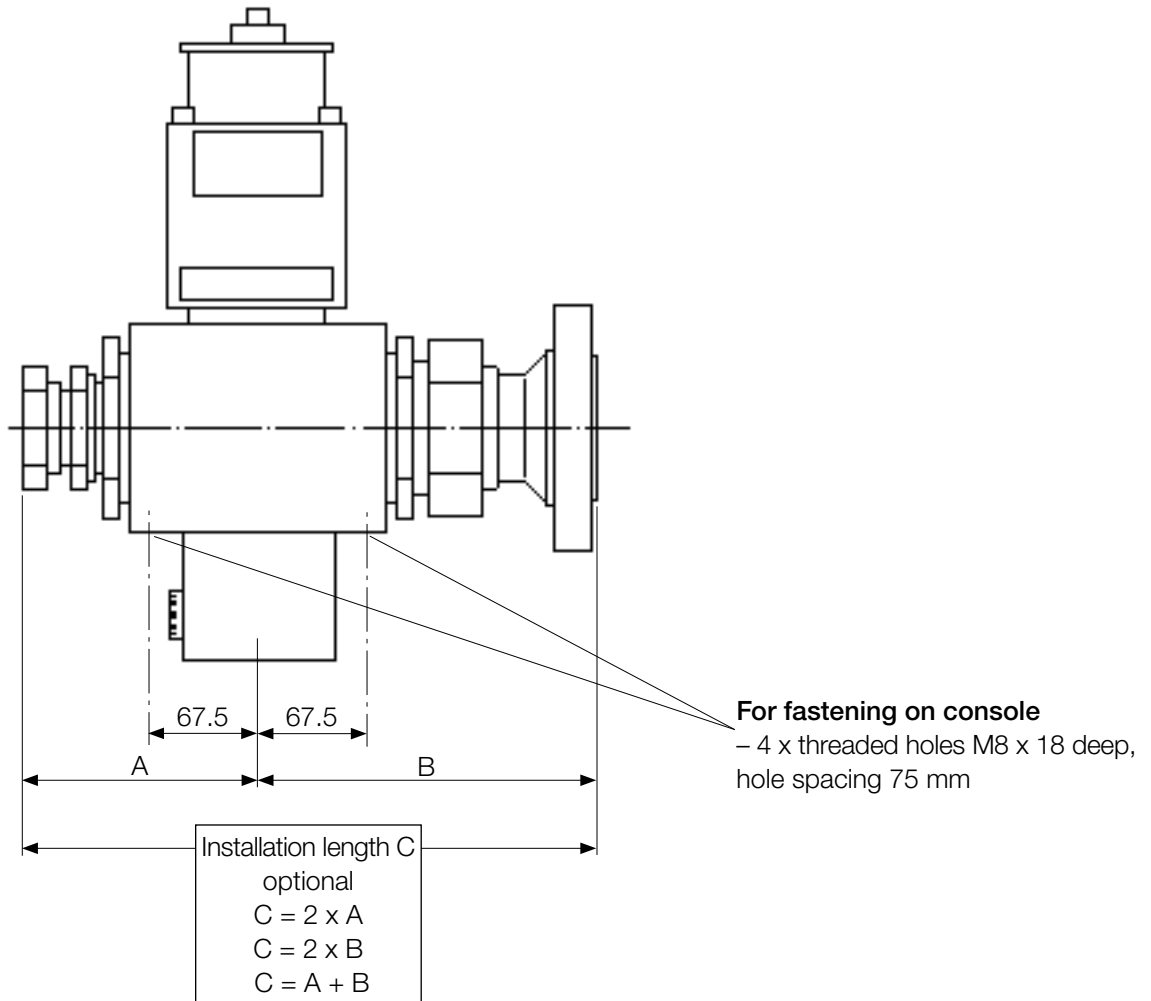
DIMENSIONS										
SSV version with control device	Device dimensions in mm									
	E	F	G	H	I	J	K	L	M	N
K1a/K2a	215	90	100	40	90	–	215	105	430	460
K16/K17	215	90	–	40	90	110	265	105	490	520
K18	260	90	–	40	90	110	430	105	860	890
CONNECTING LINES										
Measuring, vent and discharge lines					Screw connection * for pipe 12 x 1.5					

* Pipe screw connection without brazing with compression joint according to DIN 2353

Safety Shut-Off Valve HON 703 / HON 704

Dimensions

HON 704 dimensions

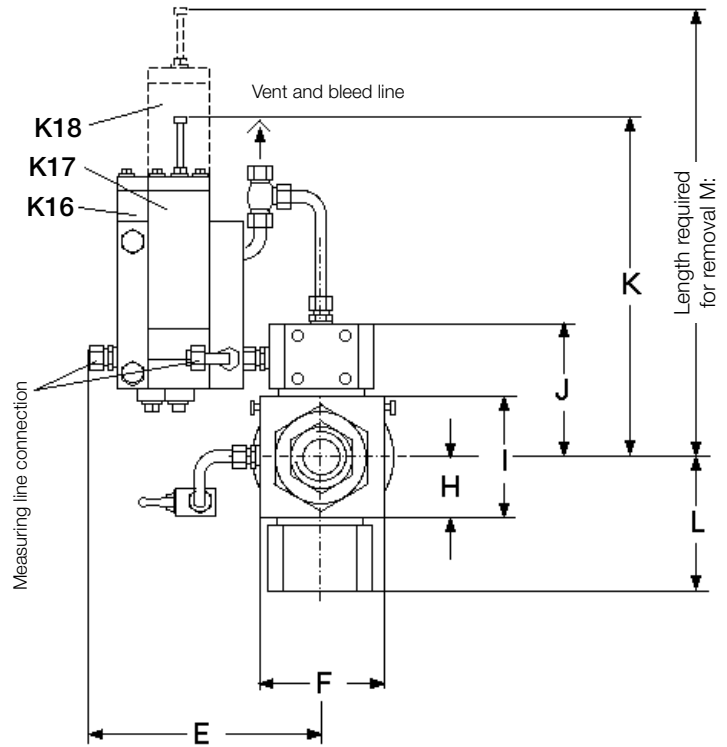
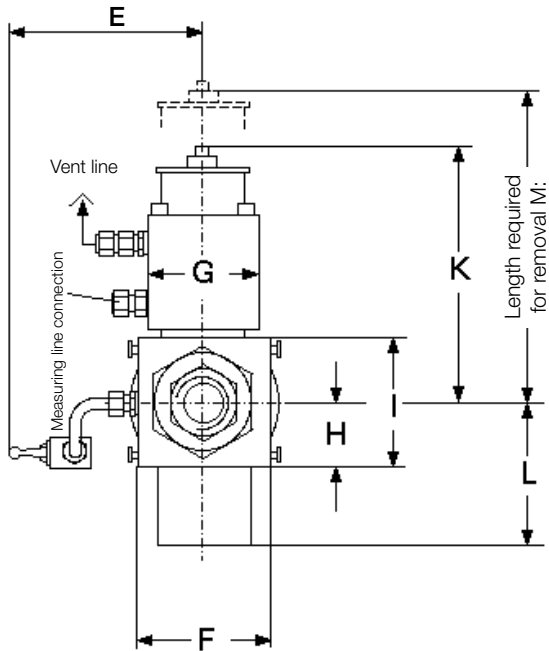


CONNECTIONS						
Pipe connection A*			Flange connection B			
Description	Pipe dimension	A in mm.	Pressure stage	B in mm		
				DN 25	DN 40	DN 50
E 10	10 x 1.5	120	PN 25 and PN 40	188	188	188
E 12	12 x 1.5	116				
E 16	16 x 1.5	126				
E 18	18 x 1.5	120	ANSI 300 RF / RJ	213	212	218
E 22	22 x 2	122				
E 25	25 x 3	136				
E 28	28 x 2	123	ANSI 600 RF / RJ	213	218	218
E 38	38 x 5	130				
E 42	42 x 3	115				

* Pipe screw connection without brazing with compression joint according to DIN 2353

Ausführung mit Kontrollgerät K1a/K2a

Version with control device K16/K17/K18



DIMENSIONS										
SSV version with control device	Device dimensions in mm									
	E	F	G	H	I	J	K	L	M	N
K1a / K2a	215	90	100	40	90	–	215	105	230	460
K16 / K17	215	90	–	40	90	110	245	105	265	520
K18	260	90	–	40	90	110	430	105	445	890

CONNECTING LINES	
Measuring, vent and discharge lines	Screw connection * for pipe 12 x 1.5

* Pipe screw connection without brazing with compression joint according to DIN 2353

Safety Shut-Off Valve HON 703 / HON 704

Construction and mode of operation

The HON 703/704 safety shut-off valves have the task of shutting off the flow in the gas pressure regulation system as soon as the pressure in the system to be secured reaches an upper (pressure exceeded) or a lower (pressure undercut) response pressure. The HON 703 double safety shut-off device consists of two independently working functional units. Therefore the requirement of DVGW worksheet 491 is fulfilled - that two SSVs working independently of each other are installed in gas pressure regulation systems with pressure ratios $p_{\text{max}} - p_{\text{perm}} > 16 \text{ bar}$ und $p_{\text{max}}/p_{\text{perm}} > 1.6$ The HON 704 safety shut-off valve has an identical configuration to that of the SAV HON 703, but it is designed as a single SSV.

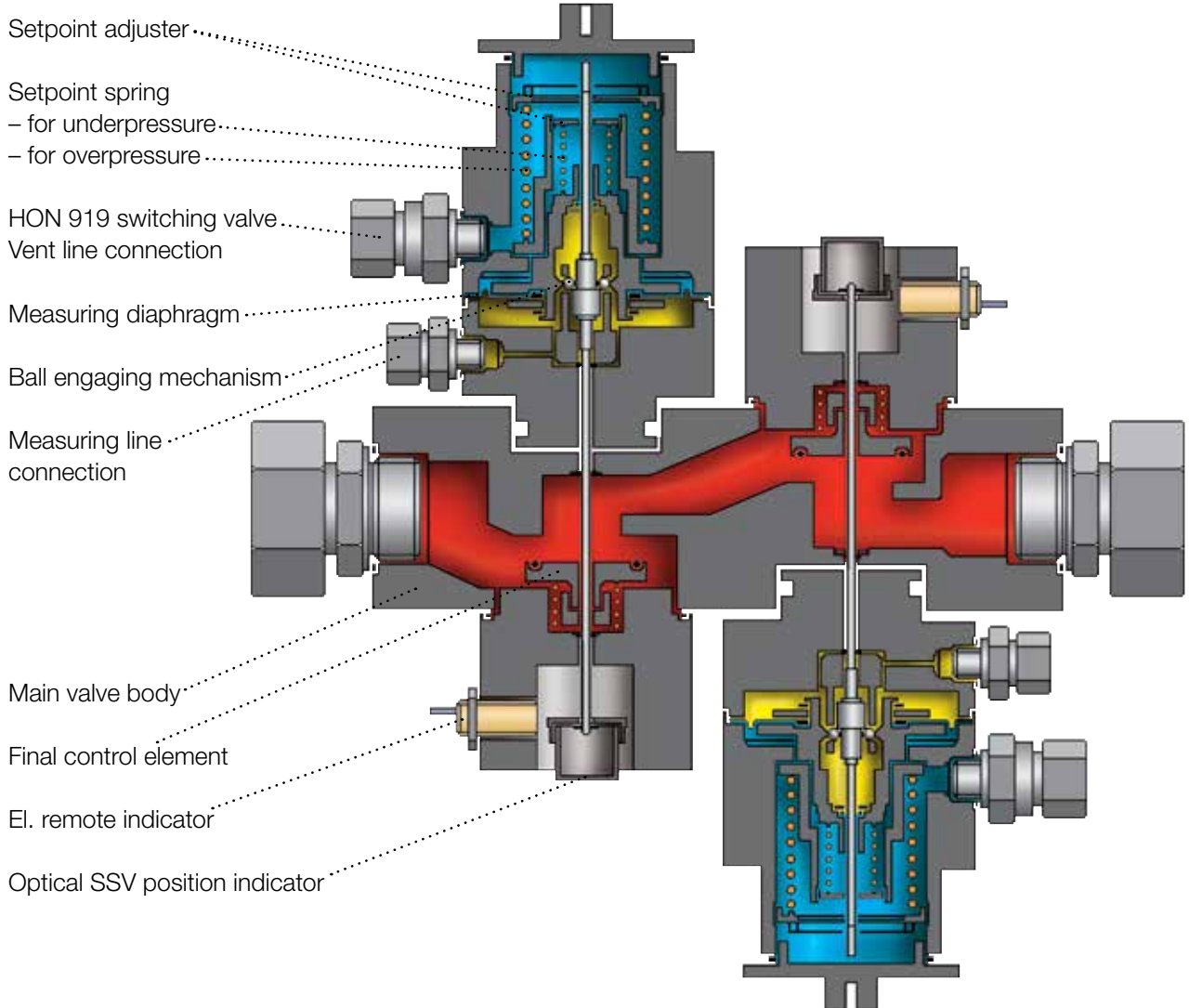
The HON 703/704 safety shut-off valves are essentially composed of the valve body, switching device, control device and bypass valve. Both devices have an especially maintenance-friendly design. Each functional group can be removed by loosening the appropriate connecting screws and the valve body remains in the line.

Mode of operation with control device... HON 673 (K 1a, K 2a)

The pressure to be monitored is applied in the compensator in the control device and is compared with the setpoints specified by the setpoint springs (response setpoint). If the adjusted release pressure setpoint is reached by exceeding or undercutting the pressure, the compensator engaging mechanism of the switching device is in the release position and the locking mechanism is released. The spring of the actuator closes the SSV.

Note: The opening of the actuator and the locking of the valve stem can only be carried out manually after the outlet pressure and the measuring point is below (after p_{max} release) or above (after p_{min} release) the re-engaging difference.

Control device



Control device

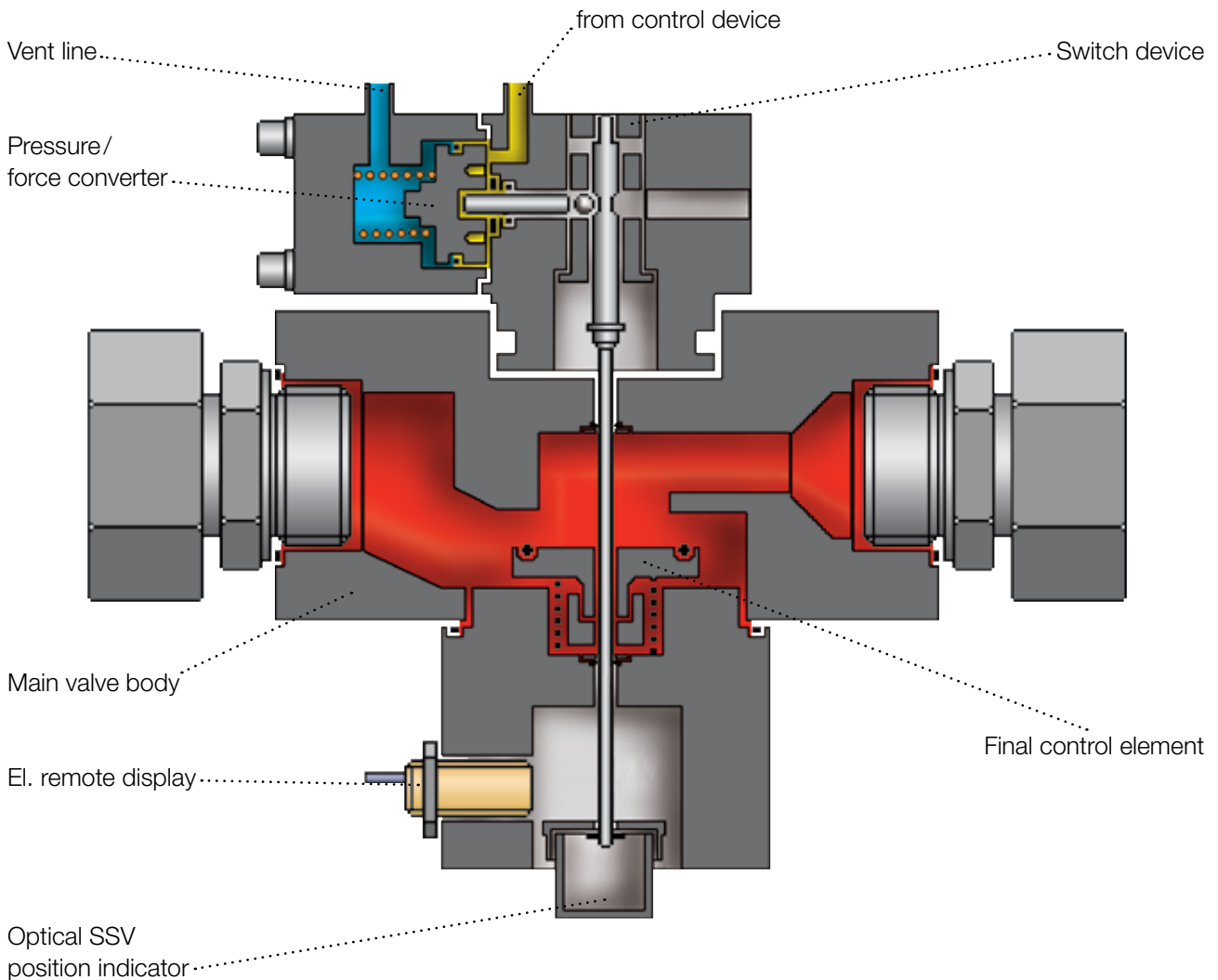
Safety Shut-Off Valve HON 703 / HON 704

Construction and mode of operation

Mode of operation with control device HON 670/671 (K16, K17, K 18)

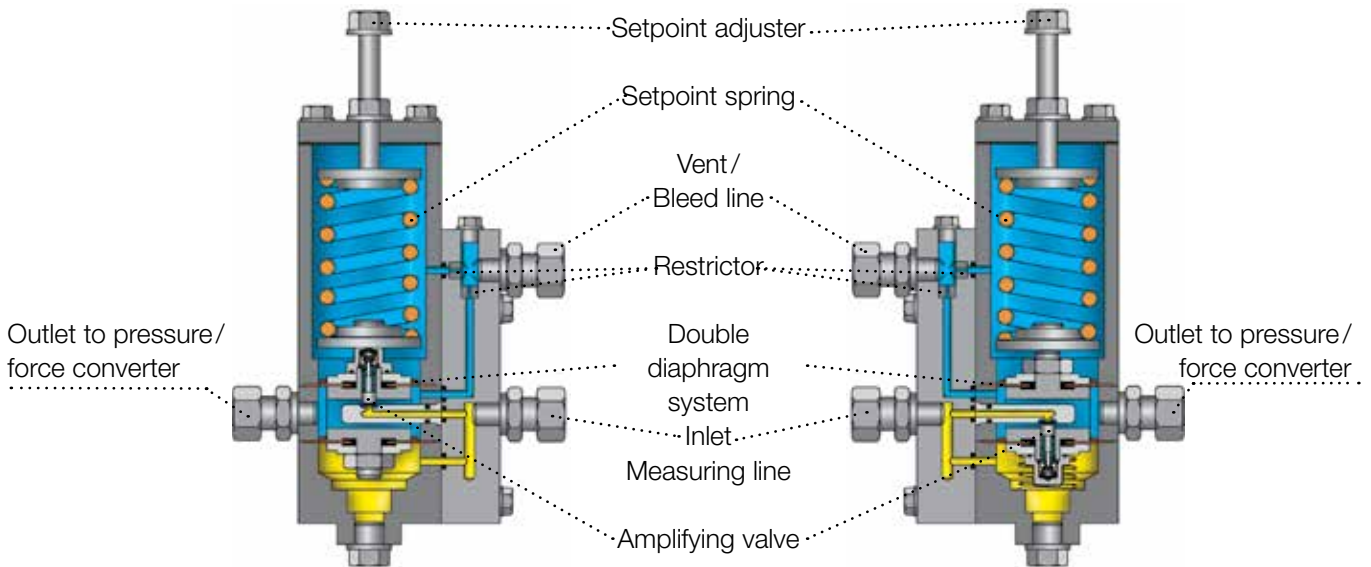
The pressure of the system to be safeguarded is routed to the top side of the sensitive double diaphragm system via a measuring line, and compared with the setpoint value specified through the setpoint adjustment screw (force of the setpoint spring). In normal operating status the amplifier valve is closed. If with the HON 670, the upper response pressure is reached, or if with the HON 671 the lower response pressure is reached, the amplifier valve opens. Gas flows out of the system to be monitored to the force/pressure converter. The piston in the force/pressure converter is moved and triggers the switch device of the SSV via the piston rod; the safety shut-off valve closes. If the cause for the triggering of the SSV is eliminated and if the pressure to be monitored has been undercut (for upper triggering, HON 670), or exceeded (for lower triggering, HON 671), the specified setpoint, the amplifier valve closes. The pressure upstream of the piston of the actuator dissipates via the restrictor integrated in the control device, and the safety shut-off valve can be reopened. The HON 670 control device also satisfies the requirement that the safety shut-off valve should trigger if the measuring diaphragm breaks: The outlet pressure to be monitored is applied on the top side of the double membrane system. A defect in this upper diaphragm of the double membrane system causes the outlet pressure to be further routed directly to the pressure/force converter and thus cause the triggering of the SSV.

SAV HON 704 with tripping device



Control device HON 670 K16
for upper setting range

Control device HON 670 K17
for lower setting range



Control device HON 670 K18
for upper setting range with metal bellows measuring unit

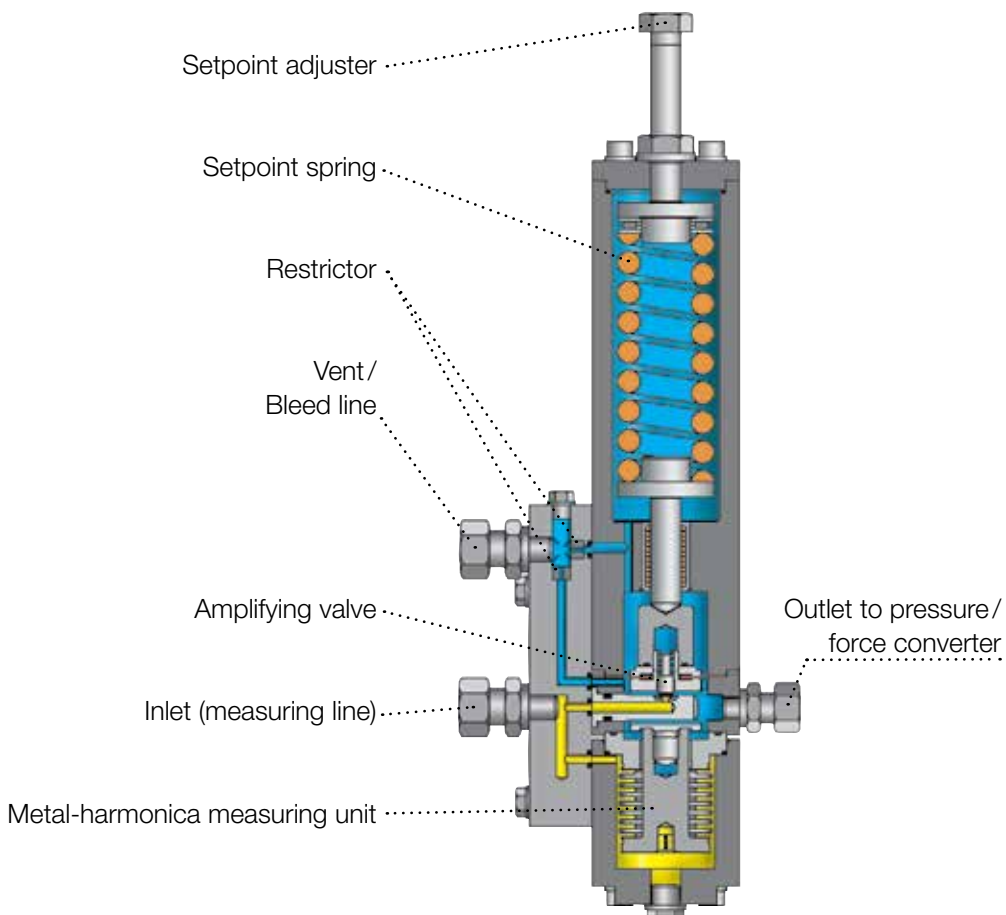
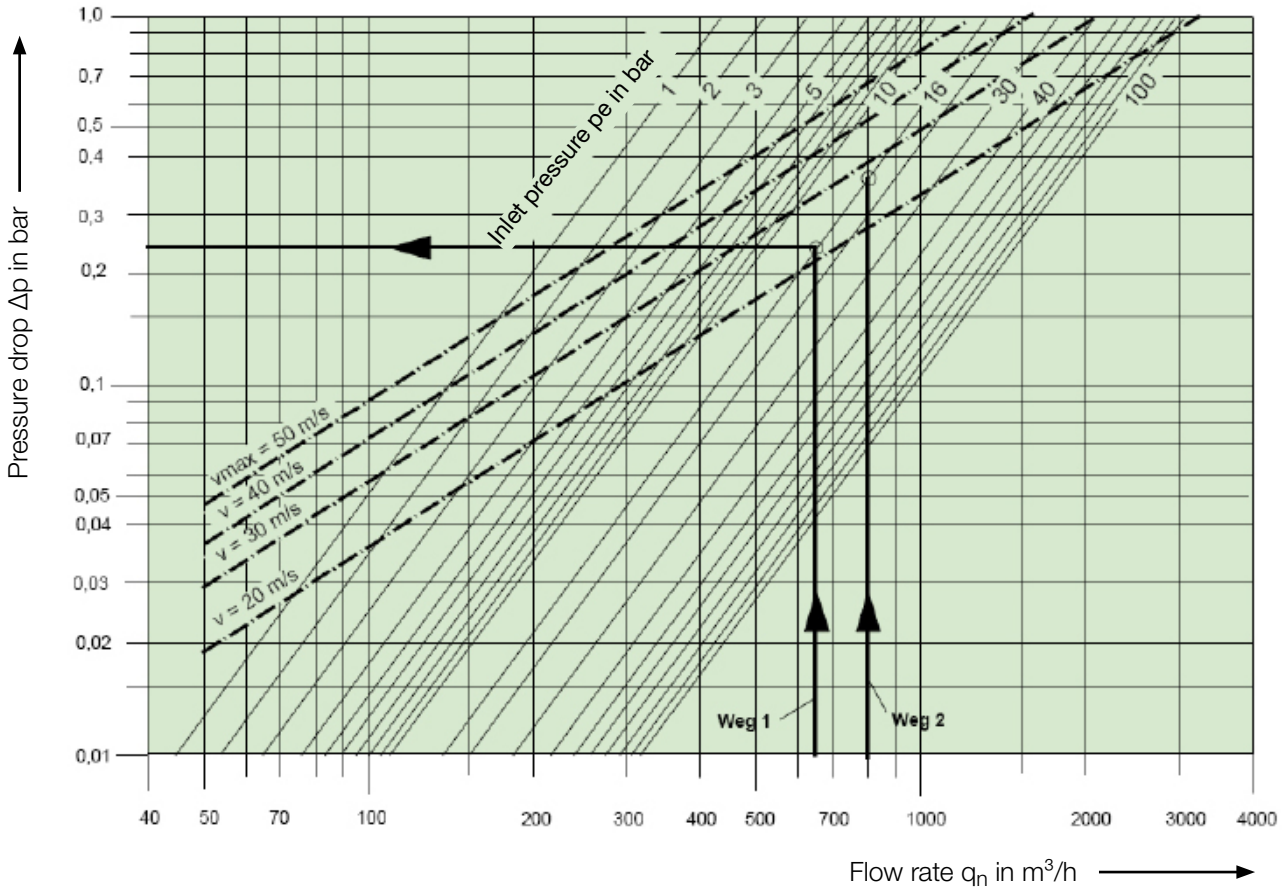


Diagram for determining the pressure drop and the flow speed for HON 703



The natural gas flow rate must be used to determine the pressure loss. Calculation takes place with the equivalent natural gas flow rate when other gases are used

$$q_n \text{ natural gas} = \frac{q_n \text{ Gas}}{f}$$

Conversion factor $f = \sqrt{0,83 / \rho_n \text{ gas}}$

Standard gas (municipal gas)	1.23
Air	0.80
Nitrogen	0.81
Oxygen	0.76
Hydrogen	3.04

Example 1:

Operating data: $p_e = 16 \text{ bar}$
 $q_n = 800 \text{ m}^3/\text{h}$ (municipal gas)

Determination of the pressure drop Δp (Path 1)
 Equivalent natural gas flow

$$q_n \text{ natural gas} = \frac{q_n \text{ Gas}}{f} = \frac{800}{1.23} = 650 \text{ m}^3/\text{h}$$

found (Path 1): Pressure drop $\Delta p \approx 0,27 \text{ bar}$

Example 2:

Operating data: $p_e = 16 \text{ bar}$
 $q_n = 800 \text{ m}^3/\text{h}$ (municipal gas)

Determination of the flow speed v (Path 2)

Flow rate of the gas

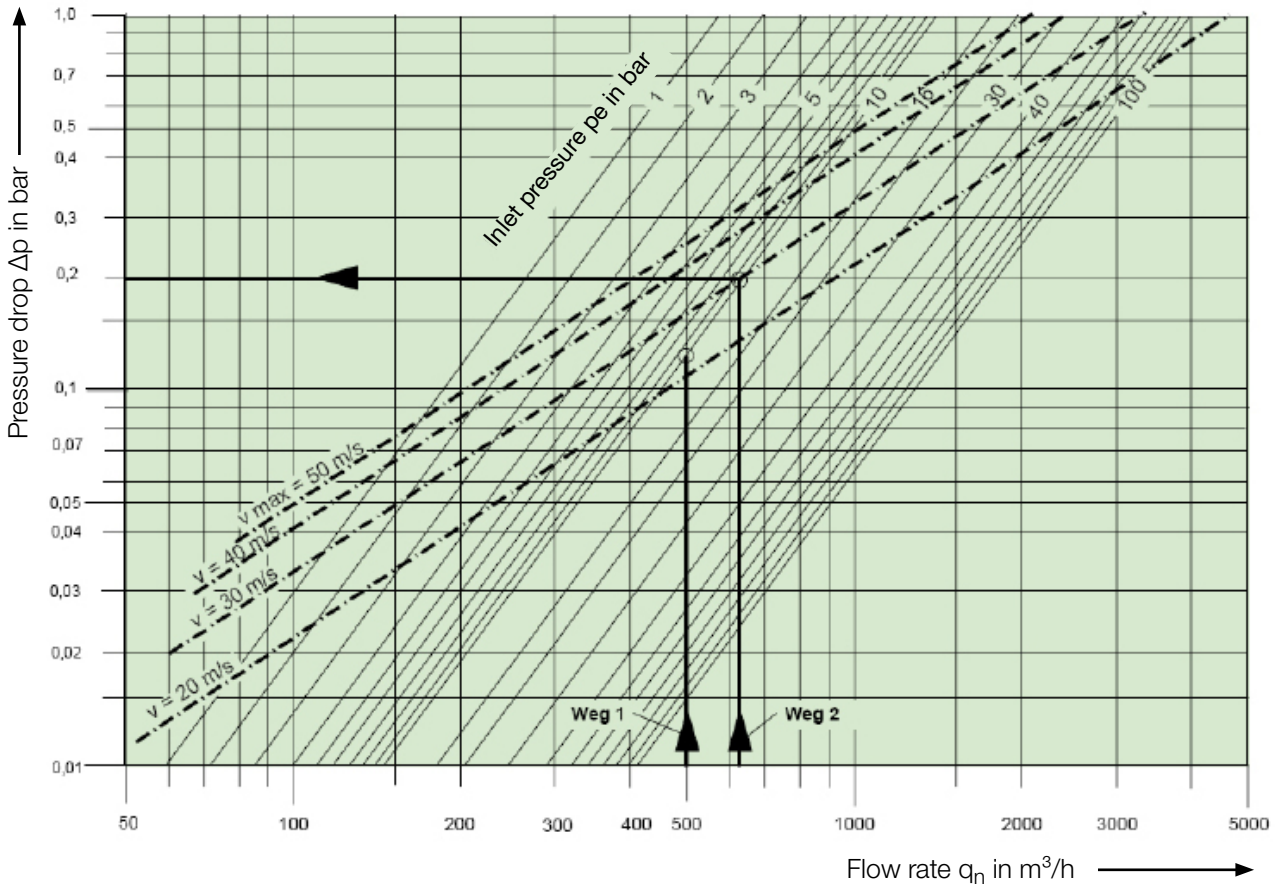
$$q_n = 800 \text{ m}^3/\text{h}$$

$$p_e = 16 \text{ bar}$$

found (Path 2):

Flow speed $v \approx 27 \text{ m/s}$

Diagram for determining the pressure drop and the flow speed for HON 704



The natural gas flow rate must be used to determine the pressure loss. Calculation takes place with the equivalent natural gas flow rate when other gases are used

$$q_n \text{ natural gas} = \frac{q_n \text{ Gas}}{f}$$

Conversion factor $f = \sqrt{0,83 / \rho_n \text{ gas}}$	
Standard gas (municipal gas)	1.23
Air	0.80
Nitrogen	0.81
Oxygen	0.76
Hydrogen	3.04

Example 1:

Operating data: $p_e = 10 \text{ bar}$
 $q_n = 500 \text{ m}^3 / \text{h}$ (nitrogen)

Determination of the pressure drop Δp (Path 2)

Equivalent natural gas flow

$$q_n \text{ natural gas} = \frac{q_n \text{ Gas}}{f} = \frac{500}{0.81} = 617 \text{ m}^3 / \text{h}$$

found (Path 2): Pressure drop $\Delta p \approx 0,2 \text{ bar}$

Example 2:

Operating data: $p_e = 10 \text{ bar}$
 $q_n = 500 \text{ m}^3 / \text{h}$ (nitrogen)

Determination of the flow speed v (Path 1)

Flow rate of the gas

$q_n = 500 \text{ m}^3 / \text{h}$

$p_e = 10 \text{ bar}$

found (Path 1):

Flow speed $v \approx 26 \text{ m/s}$

Example

HON 703 - E18 / DN 25 - K 16 - HA - E1 - F - So

DEVICE TYPE		Type
Tandem SSV	HON 703	Type
Single SSV	HON 704	
INLET AND OUTLET CONNECTIONS		
Pipe connection	E 10	Inlet connection
	E 12	
	E 16	
	E 18	
	E 22	
	E 25	
	E 28	
Flange connection	E 38	Outlet connection
	E 42	
	DN 25	
DN 40	SSV control device	
DN 50		
SSV SETTING RANGE		
Upper setting range	Lower setting range	
W_{ho} [bar]	W_{hu} [bar]	
0.05–1.5	0.01–0.12	K 1a
0.40–4.5	0.60–0.40	K 2a
0.80–40		K 16
		K 17
0.80–40	2.00–40.0	K 16/K 17
20.0–90	2.00–40.0	K 18
SUPPLEMENTAL FIXTURE		
Electrical triggering with application of current	E1	Supplemental fixture
Manual release button	HA	
Electrical position indicator	F	Remote indication
Special design (must be explained in more detail)	So	
		Special design (must be explained in more detail)

Note:

With the HON 703 tandem safety shut-off valve, it must be observed that both SSV control devices are basically equipped with the same control devices and supplemental fixtures. Special versions differ.

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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