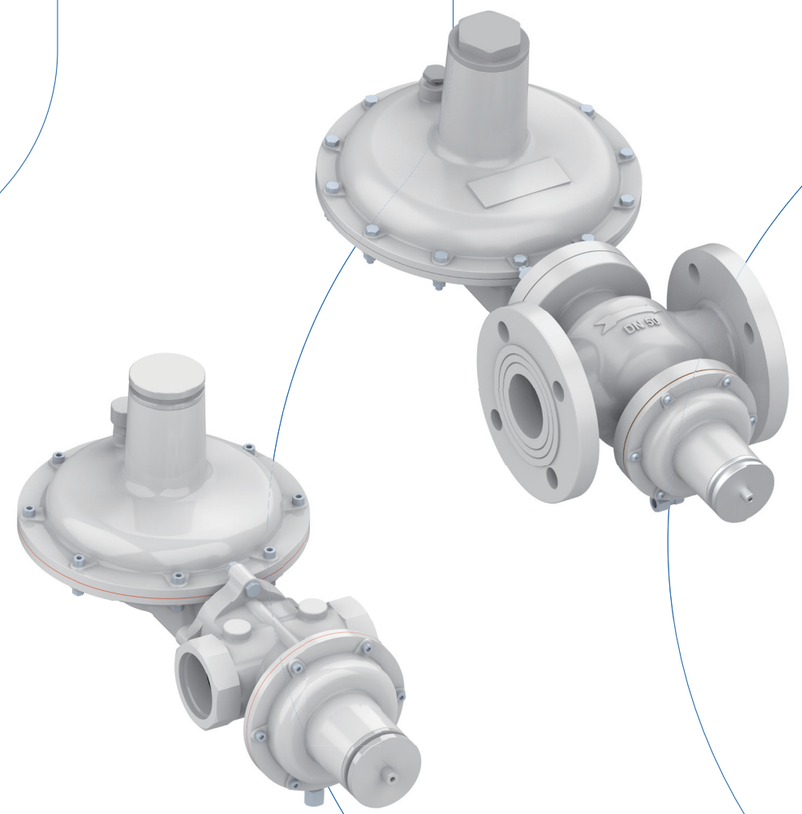
Regulator

H Series



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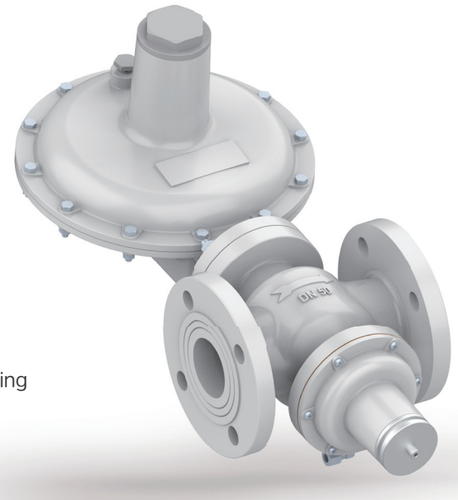
H Series

DESCRIPTION

The H series pressure regulator, equipped with loaded spring, controlling diaphragm and balanced valve, is suitable for low and medium pressure.

The regulators are widely used in both commercial and industrial installations using Natural Gas, LPG and other non-corrosive gases.



FEATURES

- High accuracy, fast response
- Low lock-up pressure, zero leakage
- Standard balanced valve, unaffected by inlet pressure fluctuations
- Fail to open
- Modular structure enables partial repairs without removing the entire unit from the pipeline
- Optional built-in relief valve
- Optional SD200 series shut-off sensor

PARAMETERS

Operating Parameters

- Maximum inlet pressure: 5 bar
- Outlet pressure regulation range: from 15 to 4000 mbar
- Accuracy class AC: up to 5
- Lock-up pressure class SG: up to 10
- Working temperature: -20℃ - +60℃

Flow Coefficient (Cg)

H200	H400	H600
260	530	730

Connection Parameters

Model	H200	H200	H400	H400	H600
Connection size	1−1/2”	DN40	2”	DN50	DN50
Pressure rating	PN16	PN16/25 Class150	PN16	PN16/25 Class150	PN16/25 Class150
Thread / Flange standards *	Internal thread in line with ISO 7−1 / PN according to EN 1092−2 Class according to ASME B16.5				

* Other flange connection standards available upon request

Materials

Valve Body	Covers	Diaphragm	Seat	O−ring
Ductile Cast Iron (GJS400−18−LT EN1563) Optional:Cast steel (ASTM A216 WCB)	Aluminum alloy ASTM A380	Reinforced fiber rubber	Brass Stainless steel	Nitrile rubber

MODEL INTRODUCTION

Model				Description
H				H Series Pressure Regulator
	2			Indicates flow rate
	4			
	6			
		1		With shut−off valve
		2		Without shut−off valve
			1	P1 ⩽ 5bar, 15mbar ⩽ P2 ⩽ 150mbar*
			2	P1 ⩽ 5bar, 0.1bar ⩽ P2 ⩽ 0.5bar
			3	P1 ⩽ 5bar, 0.4bar ⩽ P2 ⩽ 1.5bar
			3TR	P1 ⩽ 5bar, 1.5bar ⩽ P2 ⩽ 4bar
				−R Equipped with built−in relief, omitted if not equipped

*P1: Inlet pressure, P2: Outlet pressure

Model				Description
SD				Series SD Shut−off sensor
	2			Type 200 Shut−off sensor
		1		With over pressure and under pressure shut−off
		2		With over pressure shut−off
			1	27mbar ⩽ OPSO ⩽ 240mbar,10mbar ⩽ UPSO ⩽ 110mbar*
			2	185mbar ⩽ OPSO ⩽ 900mbar,100mbar ⩽ UPSO ⩽ 300mbar
			3	850mbar ⩽ OPSO ⩽ 5000mbar,235mbar ⩽ UPSO ⩽ 2000mbar

*OPSO: Over pressure shut−off value / UPSO: Under pressure shut−off value

SPRING

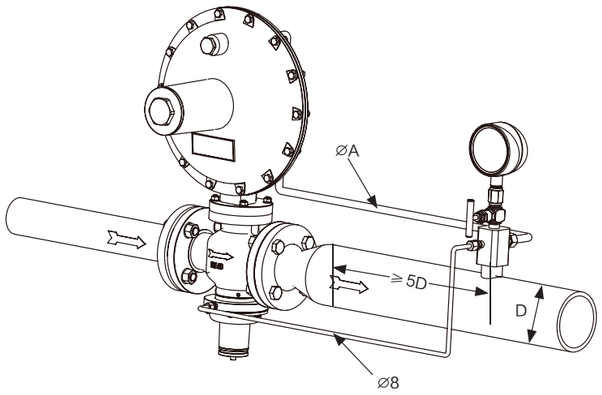
Pressure range of the regulator spring

Model	Version	Outlet pressure range (mbar)	Part number	Color
H200	H211 H221	17−27	19010802081	White
		19−32	19010803213	Yellow
		22−45	19010802082	Green
		37−63	19010802083	Yellow
		56−90	19010802084	Red
		70−105	190108020813	Black
		88−175	19010803159	White
	H212 H222	130−260	190108031510	Yellow
		240−320	190108031511	Green
		300−550	19010204122	Blue
H400	H411 H421	18−32	19010805233	Green
		24−40	19010805234	Blue
		30−55	19010805235	Red
		40−70	19010805236	Black
		60−100	19010805238	Yellow
		82−150	190108052310	Blue
	H412 H422	120−220	190108052311	Red
		180−320	190108052312	Black
		300−550	190108052313	White
H600	H611 H621	20−30	19010804172	Yellow
		30−50	19010804173	Green
		45−70	19010804174	Blue
		65−115	19010804175	Red
		105−185	19010804176	Black
	H612 H622	100−150	19010804176	Black
		142−230	19010804177	White
		215−330	19010804178	Yellow
		320−520	19010804179	Green
	H613 H623	500−800	190108200411	Red
		650−1200	190108200412	Black
		1000−1600	190108200413	White
	H613TR H623TR	1500−2500	190108200414	Yellow
		2200−3400	190108200415	Green
		3000−4200	190108200416	Blue

Pressure range of the shut-off spring

	Model	Shut-off pressure range (mbar)	Part number	Color
Over pressure shut-off	SD201	27-65	19010801658	Silver
		45-110	19010801651	White
		90-240	19010801652	Yellow
	SD202	185-460	19010801653	Green
		330-650	19010801654	Blue
		450-900	19010801655	Red
	SD203	850-1600	19010801653	Green
		1560-3400	19010801654	Blue
		3260-5000	19010801656	Black
Under pressure shut-off	SD201	5-18	19010700311	White
		16-54	19010700312	Yellow
		50-110	19010700313	Green
	SD202	100-190	19010700314	Blue
		170-300	19010700315	Red
	SD203	235-435	19010700313	Green
		405-930	19010700314	Blue
		900-2000	19010700316	Black

INSTALLATION



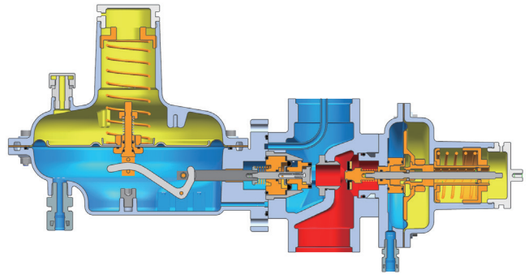
Model	H200	H400	H600
ΦA	10	10	14

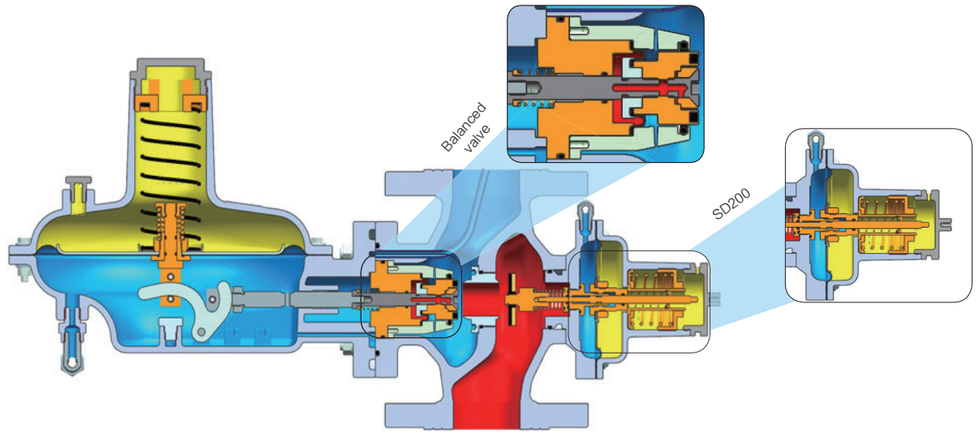
OPERATING PRINCIPLE

The H series regulator is a direct-acting regulator that provides pressure feedback through internal or internal-external sensing.

When the downstream flow demand decreases, the pressure under the diaphragm increases, which overcomes the load of the loaded spring and causes the diaphragm to move upward. The movement of the diaphragm is transmitted to the balanced valve through the lever system, and the valve seat approaches the valve orifice. The valve seat is vulcanized on the seat (part of the balanced valve).

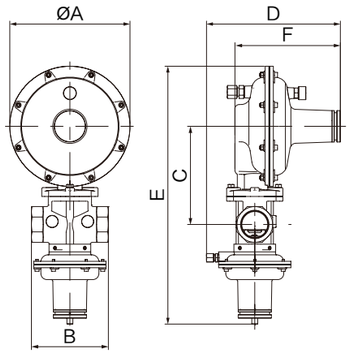
When the downstream flow demand increases, the pressure under the diaphragm decreases, which is less than the load of the loaded spring, causing the diaphragm to move downward and the valve seat to move away from the valve orifice until the flow demand decreases.



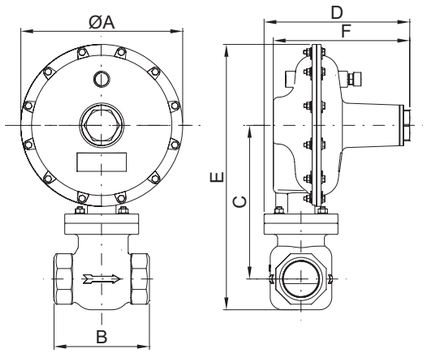


Atmospheric pressure Inlet pressure Outlet pressure

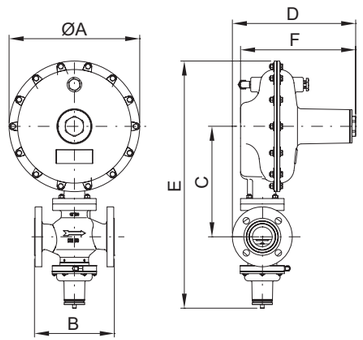
DIMENSIONS



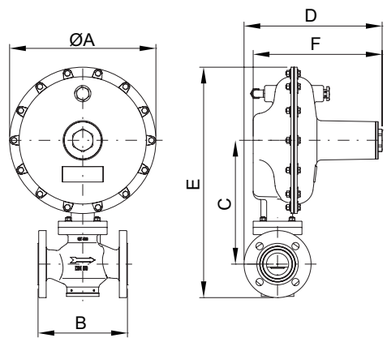
H210 1.5",H410 2"



H220 1.5”, H420 2”



H210 DN40,H410 DN50,H610



H220 DN40,H420 DN50,H620

Unit: mm

Model	A	B	C	D	E	F	Weight (Kg)
H210 1.5”	203	130	165.8	226.1	435.6	178.1	5.2
H210 DN40		180					9
H220 1.5”		130			317.6		5.2
H220 DN40		180					9
H410 2”	263	155	257	246.4	569.3	227.4	10.9
H410 DN50		200		268.1	578.3		16.6
H420 2”		155		246.4	447		10.9
H420 DN50		200		268.1	453		16.6
H611/H612	360	220	304.5	339.8	681.3	317.3	21.8
H621/H622					567		19.7
H613/H613TR	263		257	430.5	585.3	389.6	18.0

FLOW CAPACITY

The size of the regulator is usually selected based on the flow coefficient Cg. Under the reference condition (15℃), the maximum flow rate of a natural gas regulator when fully open is calculated using the following formula:

1) Sub-critical state [When (P_1-P_2) ≤ 0.5 (P_1+P_a)]

$$Q=0.526*C_g*(P_1+P_a)*\sin\left[K_1*\sqrt{\frac{P_1-P_2}{P_1+P_a}}\right] \text{ deg}$$

2) Critical state [When (P_1-P_2) > 0.5 (P_1+P_a)]

$$Q=0.526*C_g*(P_1+P_a)$$

Q — Flow rate (m^3/h);
P_1 — Inlet pressure (bar);
P_a — Atmospheric pressure (bar);
C_g — Flow coefficient;
P_2 — Outlet pressure (bar);
K_1 — valve shape coefficient, 103.3 in this formula;

When the relative density d of the gas used differs from 0.61 (natural gas) or the gas temperature is not 15 ℃, the flow rate should be multiplied by the correction factor F obtained using the following formula:

$$F=\sqrt{\frac{0.61*288}{d*(t+273)}}$$

F — Correction factor;
d — Relative density d of the gas;
t — Gas temperature (℃);
The following is the gas relative density d and correction factor F of commonly used gases at the gas temperature of 15℃ :

Gas type	Relative density d	Factor F
Air	1	0.78
Coal gas	0.44	1.18
Methane	0.55	1.05
Ethane	1.05	0.76
Propane	1.53	0.63
Butane	2.01	0.55
Nitrogen	0.97	0.79
Carbon dioxide	1.52	0.63

AC10, Capacity in Nm^3/h, Natural gas								
Inlet pressure (bar)		Outlet pressure (bar)						
		0.025	0.03	0.05	0.1	0.2	0.3	0.5
H200	0.5	100	120	160	140	180	150	–
	0.7	110	130	160	180	200	180	160
	1	160	180	230	310	320	320	370
	1.5	200	240	310	370	370	340	370
	2	300	340	500	500	450	450	460
	3	500	500	600	650	680	650	650
	4	650	680	750	850	880	800	850
	5	500	550	900	1000	1000	950	1000
H400	0.5	100	120	220	220	240	280	–
	0.7	140	160	200	280	320	300	260
	1	250	300	325	380	450	500	450
	1.5	320	375	425	525	600	600	650
	2	500	550	550	650	700	700	700
	3	800	800	900	850	1050	1050	1050
	4	1000	1100	1200	1100	1200	1300	1300
	5	800	900	1300	1400	1400	1400	1400

AC10, Capacity in Nm^3/h, Natural gas											
Inlet pressure (bar)		Outlet pressure (bar)									
		0.025	0.03	0.05	0.1	0.2	0.3	0.5	1	2	3	4
H600	0.5	250	320	320	320	320	300	–	–	–	–	–
	0.7	300	380	400	450	520	500	400	–	–	–	–
	1	360	440	450	550	575	600	500	–	–	–	–
	1.5	500	600	700	750	750	820	800	650	–	–	–
	2	650	760	800	900	950	1050	1050	850	–	–	–
	3	800	1000	1000	1300	1300	1400	1400	1300	1050	–	–
	4	1100	1300	1300	1600	1600	1800	1800	1700	1500	1250	–
	5	1200	1300	1600	1700	2000	2300	2200	2350	1950	1600	1400