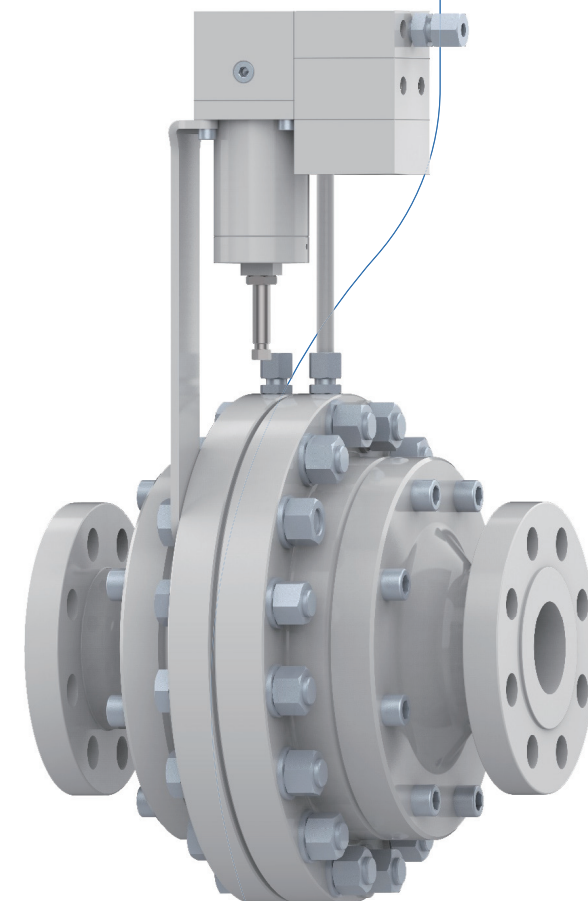




Regulator **AR Series**



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AR Series

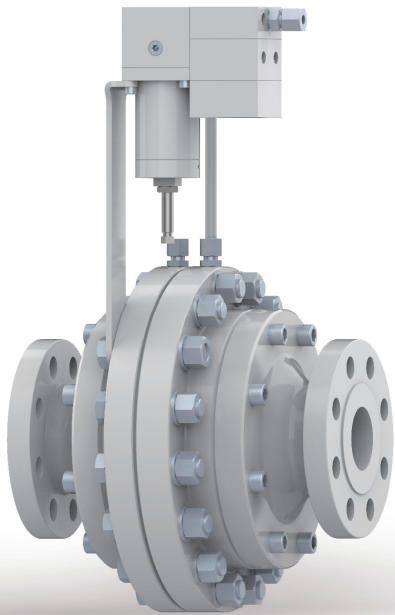
DESCRIPTION

The AR series pressure regulator is an indirect-acting regulator equipped with the DGP300 series high-performance pilot, is suitable for medium and high pressure.

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

FEATURES

- High flow coefficient
- Low startup differential press
- Fail to close/ fail to open
- Equipped with valve position
- Optional silencer (internal or
- Optional valve position remot



PARAMETERS

Operating Parameters

- Maximum inlet pressure: 100 bar
- Outlet pressure regulation range: 0.5–80bar
- Accuracy class AC: up to 1
- Lock-up pressure class SG: up to 2.5
- Working temperature: –20℃ –+60℃

Flow Coefficient (Cg)

AR100	AR200	AR300	AR400	AR600	AR800
620	2300	5200	8400	19500	32000

Connecting Parameters

Model	AR100	AR200	AR300	AR400	AR600	AR800
Connecting size	DN25	DN50	DN80	DN100	DN150	DN200
Pressure rating	Class300/Class600					
Flange standards*	Class according to ASME B16.5					

* Other connection standards can be provided upon request

Materials

Connector	Diaphragm cover	Plate	Diaphragm	Sleeve	O-ring
Forging ASTM A350 LF2	Forging ASTM A350 LF2	Forging ASTM A350 LF2	Reinforced fiber rubber	Alloy steel	Nitrile rubber (NBR) Fluoro rubber (FKM)

MODEL INTRODUCTION

Model	Description
AR	AR series pressure regulator
FTO	Indicates "fail to open"; if omitted, it defaults to "fail to close"
1	Indicates different nominal diameters, such as "1" representing the nominal diameter of NPS1" (DN25)
2	
3	
4	
6	
8	
0 3	P1 ≤ 100bar, 0.5bar ≤ P2 ≤ 13bar*
4	P1 ≤ 100bar, 13bar ≤ P2 ≤ 40bar
5	P1 ≤ 100bar, 40bar ≤ P2 ≤ 80bar
300	Nominal pressure rating (Class)
600	
SLI	Equipped with internal silencer, omitted if not equipped
SLE	Equipped with internal and external silencers, omitted if not quipped

*P1: Inlet pressure, P2: Outlet pressure

Model	Description
DGP	DGP series pilot
3	Type 300 pilot
0 3	P1 ≤ 100bar, 0.5bar ≤ P2 ≤ 13bar
4	P1 ≤ 100bar, 13bar ≤ P2 ≤ 40bar
5	P1 ≤ 100bar, 40bar ≤ P2 ≤ 80bar

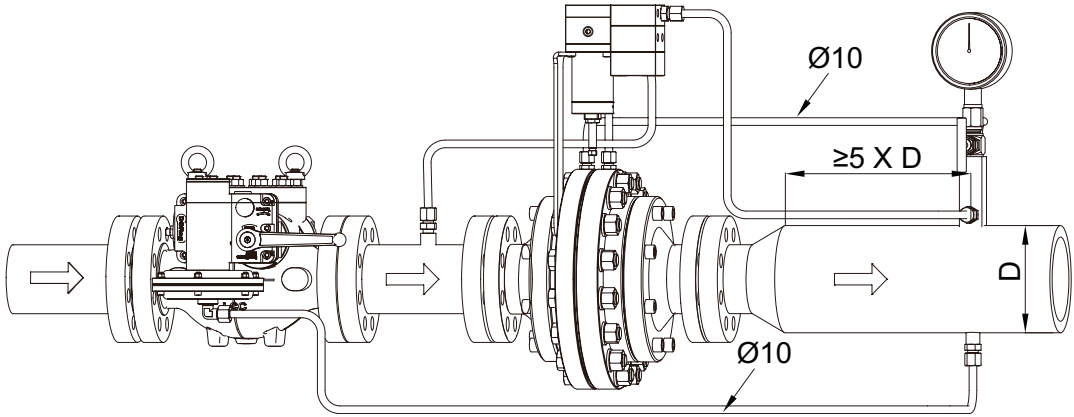
*P1: Inlet pressure, P2: Outlet pressure

SPRING

Pressure range of the pilot spring

Model	Version	Outlet pressure range(mbar)	Part number	Color
DGP300	DGP303	500–1200	19010500321	Purple-Red
		1100–2600	19010500322	Medium Yellow
		2200–4000	19010500323	Light Blue
		3500–6000	19011001121	White
		5500–9000	19011001122	Yellow
		8000–17000	19011001123	Green
	DGP304	8000–17000	19011001123	Blue
		16000–22000	19011001124	Red
		21000–27000	19011001125	Black
		26000–31000	19011001126	White
		29000–40000	19011001127	Yellow
	DGP305	39000–80000	19011001128	Green

INSTALLATION

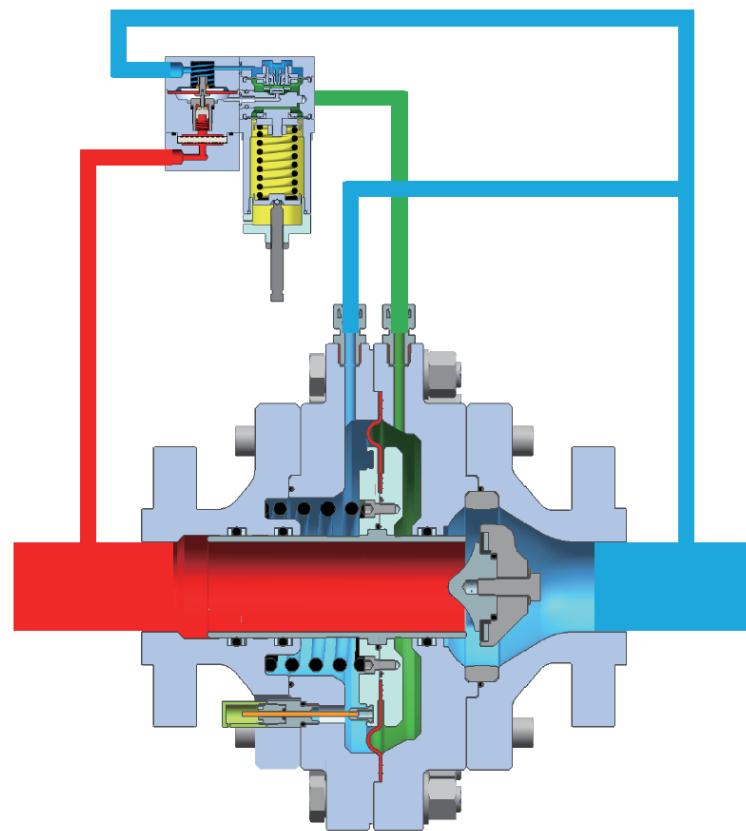


OPERATING PRINCIPLE

The AR series pressure regulator is an indirect-acting regulator equipped with the DGP300 series pilot.

When the downstream flow demand decreases, the outlet pressure above the diaphragm and the pilot increases. Under the joint action of the load pressure set by the pilot and the outlet pressure above the diaphragm, the diaphragm moves downward, and the movement of the diaphragm drives the valve orifice to move downward. The valve seat installed on the valve body is vulcanized with rubber to ensure a tight fit between the seat and the orifice for sealing purposes.

When the downstream flow demand increases, the outlet pressure above the diaphragm and the pilot decreases. Under the joint action of the load pressure set by the pilot and the outlet pressure above the diaphragm, the diaphragm moves upward, and the movement of the diaphragm drives the valve orifice to move upward, moving away from the valve seat, until the flow demand decreases.

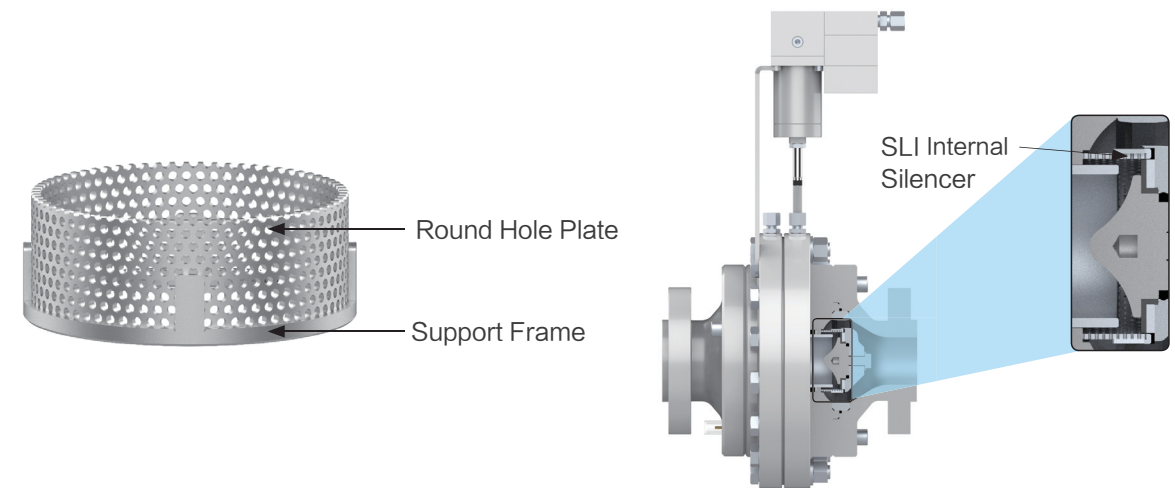


■ atmospheric pressure
 ■ inlet pressure
 ■ outlet pressure
 ■ actuating pressure

SILENCER

SLI Internal Silencer

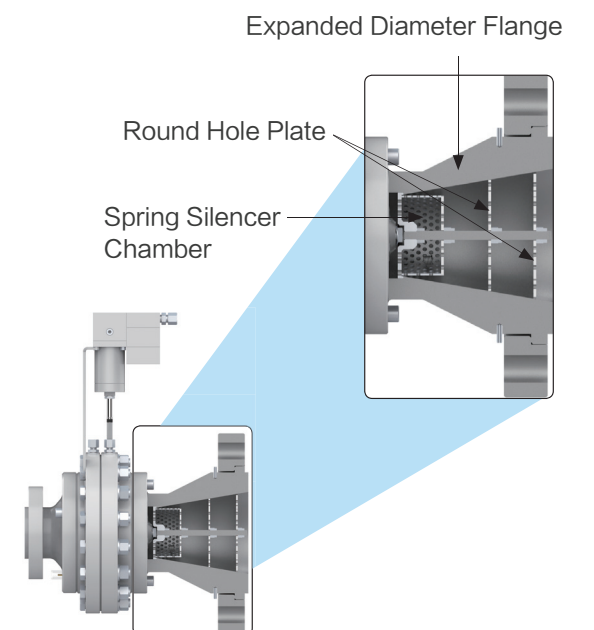
The AR series pressure regulator can be equipped with an embedded internal silencer. This silencer consists of an external support frame and a round hole plate. The SLI silencer features a simple and compact structure, low pressure loss, high clogging resistance, and a broad noise suppression bandwidth. Even under extreme operating conditions with low inlet pressure and flow velocity, it guarantees maximum flow of gas passes through the regulator with the smallest nominal diameter while achieving noise reduction.



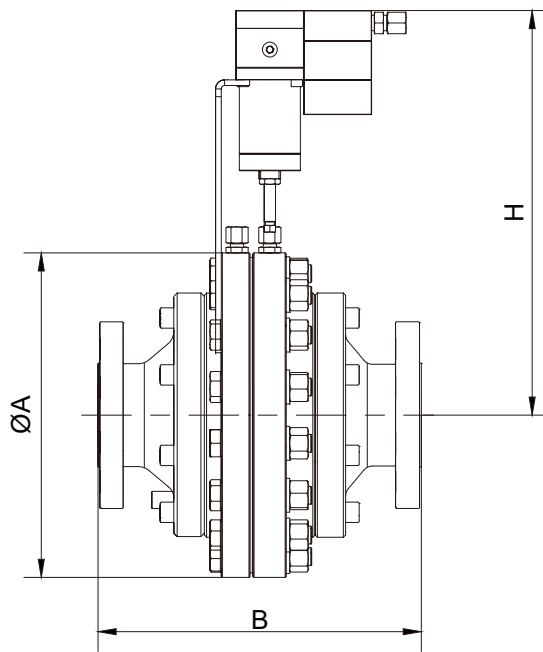
SLE Expanded Diameter External Silencer

The AR series pressure regulator can be equipped with an expanded diameter external silencer. This silencer consists of an expanded diameter flange, two sections of round hole plates, and a cylindrical chamber densely packed with small springs. By replacing the outlet flange of the regulator, the expanded diameter flange allows direct installation of the silencer onto the regulator, eliminating noise caused by reducer couplings in the pipeline. The enlarged diameter chamber also provides ample space for mounting the spring silencer chamber and round hole plates.

Under various operating conditions, as gas flows through the spring silencer chamber and round hole plates, it is dispersed and buffered. The sudden expansion of the internal channel rapidly reduces airflow velocity, scattering the concentrated acoustic energy through gas diffusion. During continuous reflection and collision with the silencer's inner walls, the acoustic energy is gradually converted into thermal energy and other forms, thereby achieving noise reduction. The SLE expanded diameter external silencer adopts a modular design, offering technical advantages such as a reliable structure, broad adaptability, clog-resistant operation, low airflow resistance, and excellent noise suppression performance.

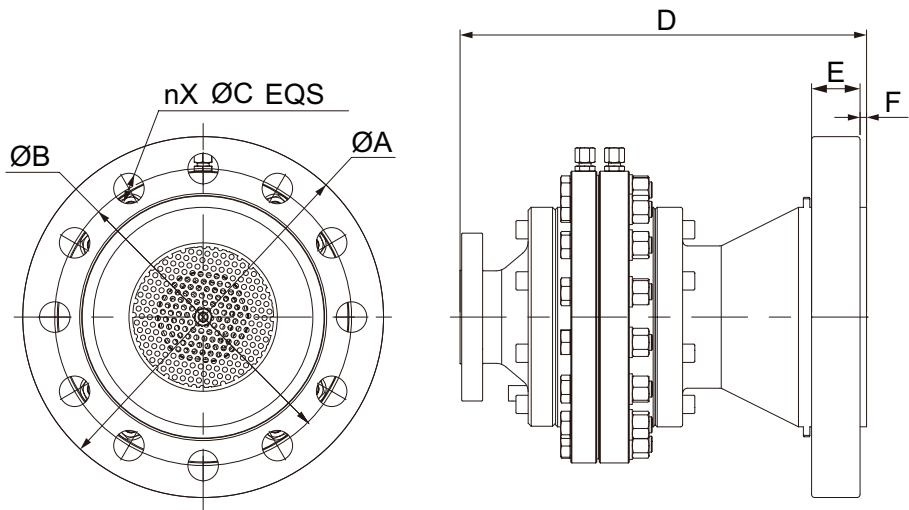


DIMENSIONS



unit : mm

Model	Pressure rate	A	B	H	weight (Kg)
AR 100	Class300 / Class600	225	210	355	30
AR 200	Class300 / Class600	287	286	392	60
AR 300	Class300 / Class600	400	337	418.5	146
AR 400	Class300 / Class600	480	394	447	205
AR 600	Class300 / Class600	610	508	480	465
AR 800	Class300 / Class600	653	610	210	648



unit : mm

Model	Pressure rate	A	B	n	C	D	E	F	weight (Kg)
AR100-SLE	Class300	255	200	8	22	300	30.2	1.6	51
	Class600	275	215.9	8	26	300	38.1	6.4	
AR200-SLE	Class300	320	269.9	12	22	400	35	1.6	95
	Class600	355	292.1	12	30	400	47.7	6.4	
AR300-SLE	Class300	455	387.4	16	30	500	46.1	1.6	218
	Class600	510	431.8	16	36	500	63.5	6.4	
AR400-SLE	Class300	455	387.4	16	30	525	46.1	1.6	260
	Class600	510	431.8	16	36	525	63.5	6.4	
AR600-SLE	Class300	520	450.8	16	33	660	49.3	1.6	562
	Class600	560	489.0	20	36	660	66.7	6.4	
AR800-SLE	Class300	650	571.5	20	36	722	55.6	1.6	861
	Class600	685	603.5	20	42	750	76.2	6.4	

FLOW CAPACITY

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

1) Sub-critical state [When (P₁- P₂) ≤ 0.5 (P₁+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 (P₁- P₂) > 0.5 (P₁+P_a)]

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

Q — Flow rate (m³/h) ;
P₁ — Inlet pressure (bar) ;
P_a — Atmospheric pressure (bar) ;

C_g — Flow coefficient;
P₂ — Outlet pressure (bar) ;
K₁ — valve shape coefficient,136 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 °C , 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 (°C) ;
The following is the gas relative density d and correction factor F of commonly used gases at the gas temperature of 15 °C :

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