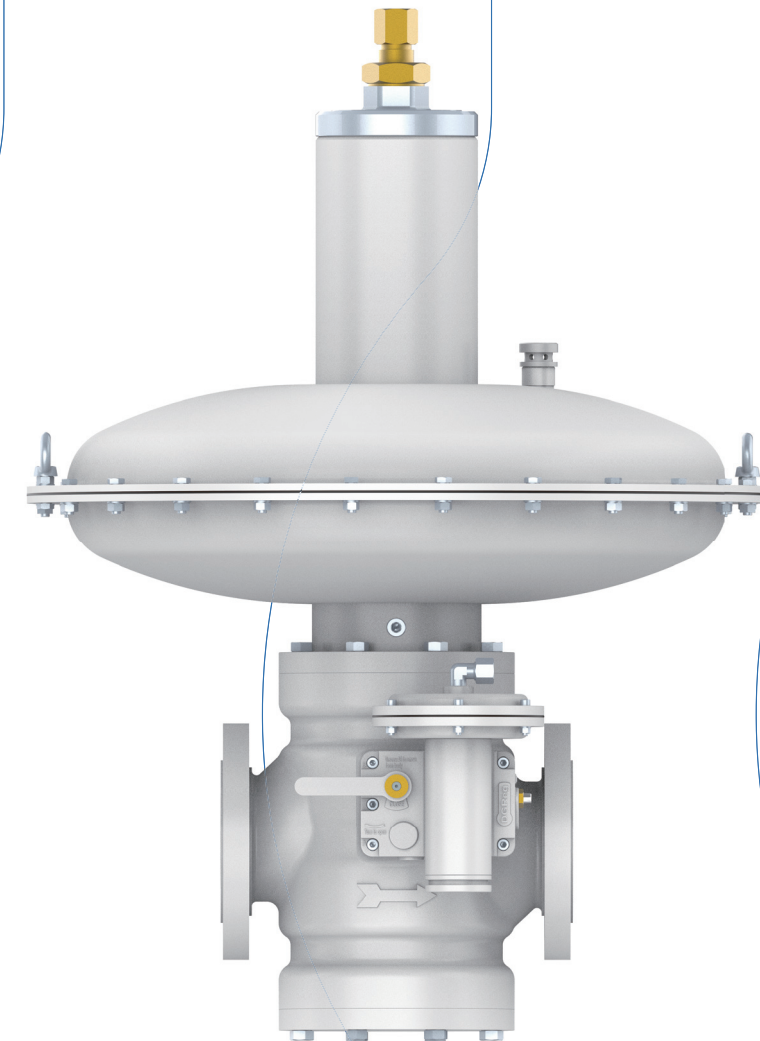




Regulator **DA Series**



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DA Series

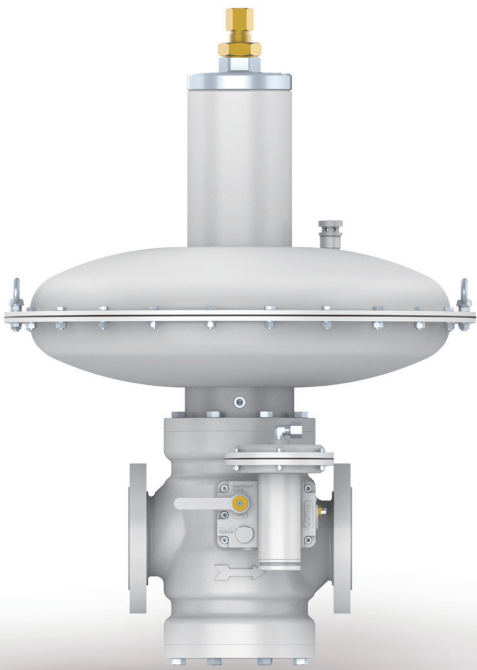
DESCRIPTION

The DA 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, large flow rate
- Vertical straight-rod structure,fast response
- Large diaphragm structure, 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 SD500 series shut-off sensor
- Optional valve position remote transmission and shut-off remote transmission device



PARAMETERS

Operating Parameters

- Maximum inlet pressure:
5 bar for diaphragm balanced valve
20 bar for piston balanced valve
- 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)

DA200	DA300	DA400
1700	3700	5300

Connection Parameters

Model	DA200	DA300	DA400
Connecting size	DN50	DN80	DN100
Pressure rating	PN16/25 / Class150		
Flange standard*	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 (GJS 400-18-LT EN1563) Optional: Cast steel (ASTM A216 WCB)	Carbon steel EN 10028	Reinforced fiber rubber	Stainless steel	Nitrile rubber

MODEL INTRODUCTION

Model	Description
DA	DA Series Pressure Regulator
2	Indicates different nominal diameters, such as “2” representing the nominal diameter of NPS2” (DN 50)
3	
4	
1	With shut-off valve
2	Without shut-off valve
1	P1 ≤ 5bar, 15mbar ≤ P2 ≤ 170mbar, With diaphragm balanced valve*
2	P1 ≤ 5bar, 0.14bar ≤ P2 ≤ 0.5bar, With diaphragm balanced valve
3	P1 ≤ 5bar,0.4bar ≤ P2 ≤ 0.95bar,with diaphragm balanced valve
4	P1 ≤ 5bar,0.9bar ≤ P2 ≤ 2.1bar,with diaphragm balanced valve
4TR	P1 ≤ 5bar,2.0bar ≤ P2 ≤ 4bar,with diaphragm balanced valve
5	P1 ≤ 20bar,0.4bar ≤ P2 ≤ 0.95bar,with piston balanced valve
6	P1 ≤ 20bar,0.9bar ≤ P2 ≤ 2.1bar,with piston balanced valve
6TR	P1 ≤ 20bar,2.0bar ≤ P2 ≤ 4bar,with piston balanced valve

*P1: Inlet pressure, P2: Outlet pressure

Model	Description
SD	SD Series Shut-off sensor
5	Type 500 Shut-off sensor
1	With over pressure and under pressure shut-off
2	With over pressure shut-off
1	26mbar ≤ OPSO ≤ 260mbar,5mbar ≤ UPSO ≤ 90mbar
2	240mbar ≤ OPSO ≤ 800mbar,60mbar ≤ UPSO ≤ 340mbar
3	750mbar ≤ OPSO ≤ 5000mbar,300mbar ≤ UPSO ≤ 2400mbar

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

SPRING

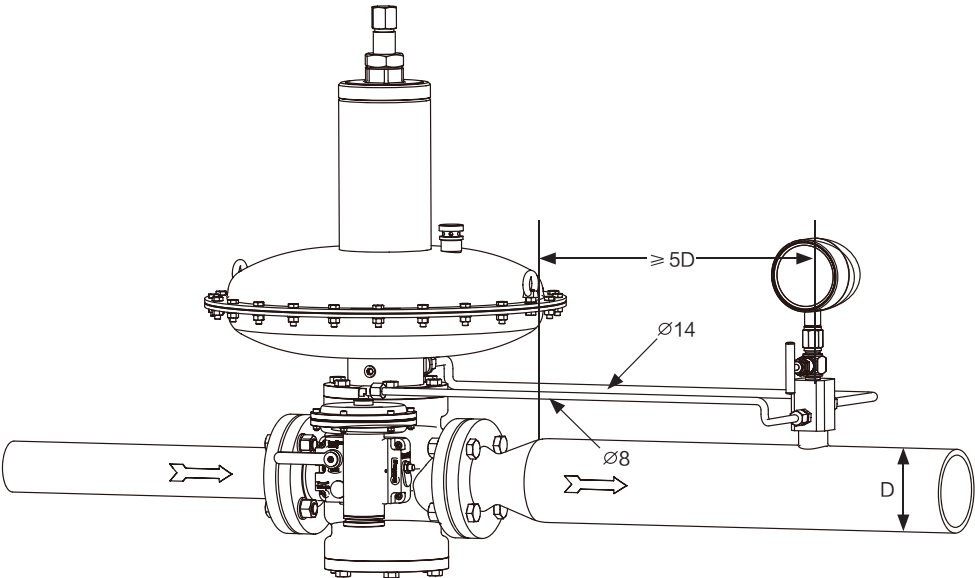
Pressure range of the regulator spring

Model	Version	Outlet pressure range (mbar)	Part number	Color
DA200	DA211	16-23	190107040820	Yellow
		21-33	190107040821	Green
		31-56	19010704087	White
		46-86	19010704089	Green
		73-130	190107040811	Red
		110-215	190107040812	Black
	DA212	110-215	190107040812	Black
		185-360	190107040814	Yellow
		345-580	190107040816	Blue
	DA213 DA215	300-450	190107040812	Black
		430-680	190107040813	White
	DA214 DA216	660-1100	190107040815	Green
		800-1400	190107040813	White
		1000-1700	190107040814	Yellow
		1300-2050	190107040815	Green
	DA214TR	1850-2900	190107040816	Blue
	DA216TR	2600-4200	190107040817	Red
DA300 DA400	DA311 DA411	20-26	19010704081	White
		24-32	19010704082	Yellow
		30-54	19010704083	Green
		52-90	19010704084	Blue
		86-133	19010704085	Red
		115-170	19010704086	Black
	DA312 DA412	135-240	190107040812	Black
		180-350	190107040813	White
		220-430	190107040814	Yellow
	DA313 DA315 DA413 DA415	300-540	190107040815	Green
		350-570	190107040812	Black
		500-780	190107040813	White
		600-950	190107040814	Yellow
	DA314 DA316 DA414 DA416	700-1200	190107040812	Black
		950-1650	190107040813	White
		1100-2100	190107040814	Yellow
	DA314TR	1600-2500	190107040815	Green
	DA316TR	2100-3100	190107040816	Blue
	DA414TR			
	DA416TR	2600-4300	190107040817	Red

Pressure range of the shut-off spring

	Model	Shut-off pressure range (mbar)	Part number	Color
Over pressure shut-off	SD501	26-51	19010801658	Silver
		35-78	19010801651	White
		55-150	19010801652	Yellow
		120-260	19010801653	Green
	SD502	240-450	19010801654	Blue
		400-800	19010801655	Red
		750-1400	19010801653	Green
	SD503	1200-2200	19010801654	Blue
		1800-3500	19010801656	Black
		3300-5000	19010801657	White
Under pressure shut-off	SD501	6-20	19010700311	White
		12-40	19010700312	Yellow
		30-90	19010700313	Green
	SD502	60-200	19010700314	Blue
		130-340	19010700315	Red
		300-700	19010700314	Blue
	SD503	460-1260	19010700315	Red
		900-2400	19010700317	White

INSTALLATION

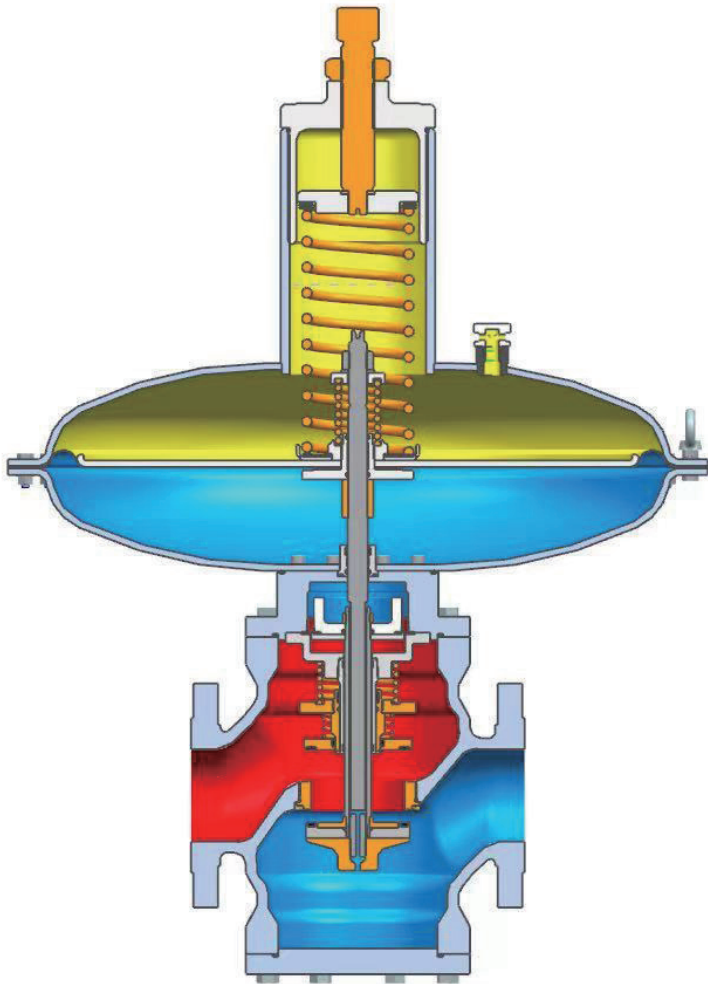


OPERATING PRINCIPLE

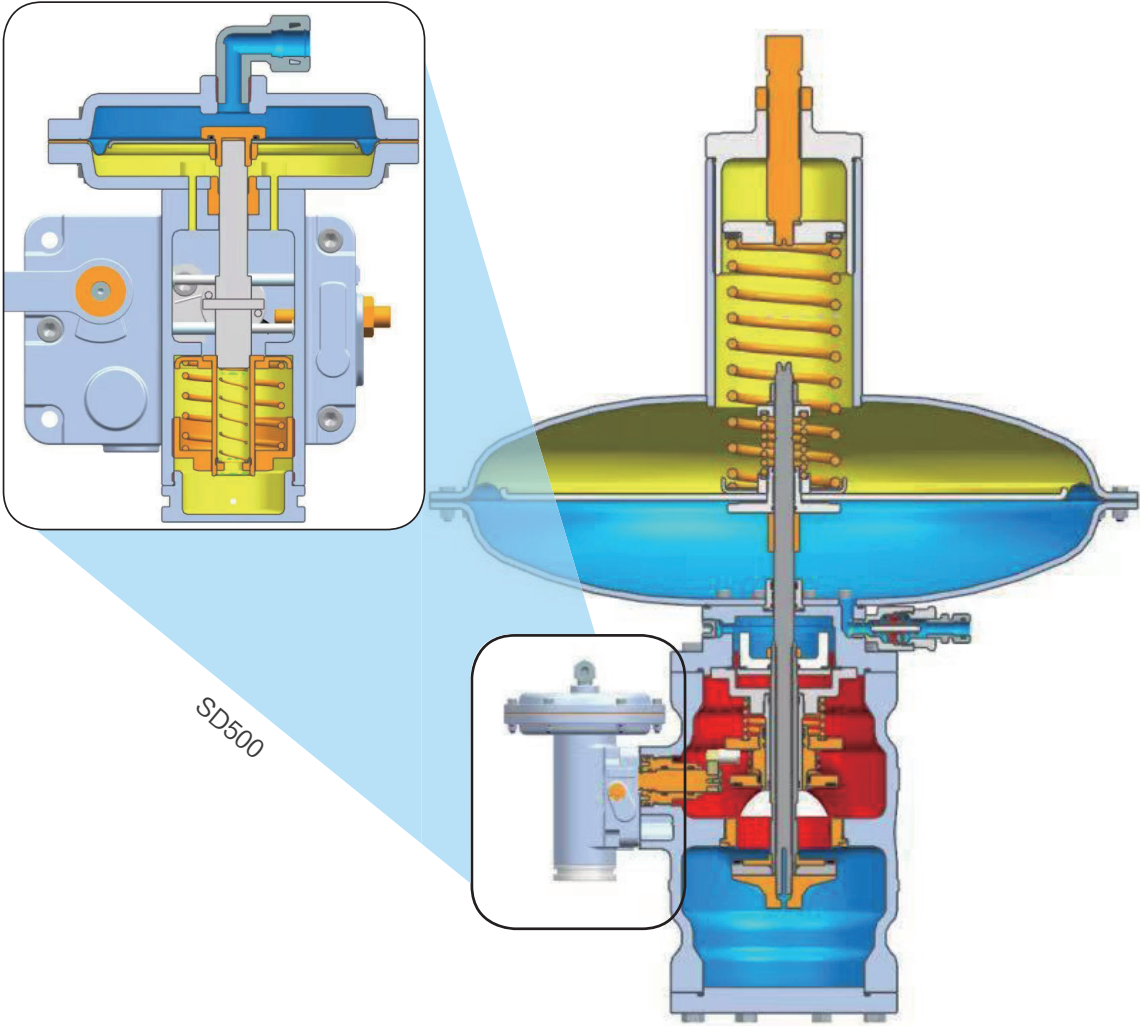
DA series pressure regulator is a direct-acting regulator that provides pressure feedback through external sensing.

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 valve seat through the main valve stem system, and the valve seat approaches the valve orifice. The valve seat is vulcanized on the seat.

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

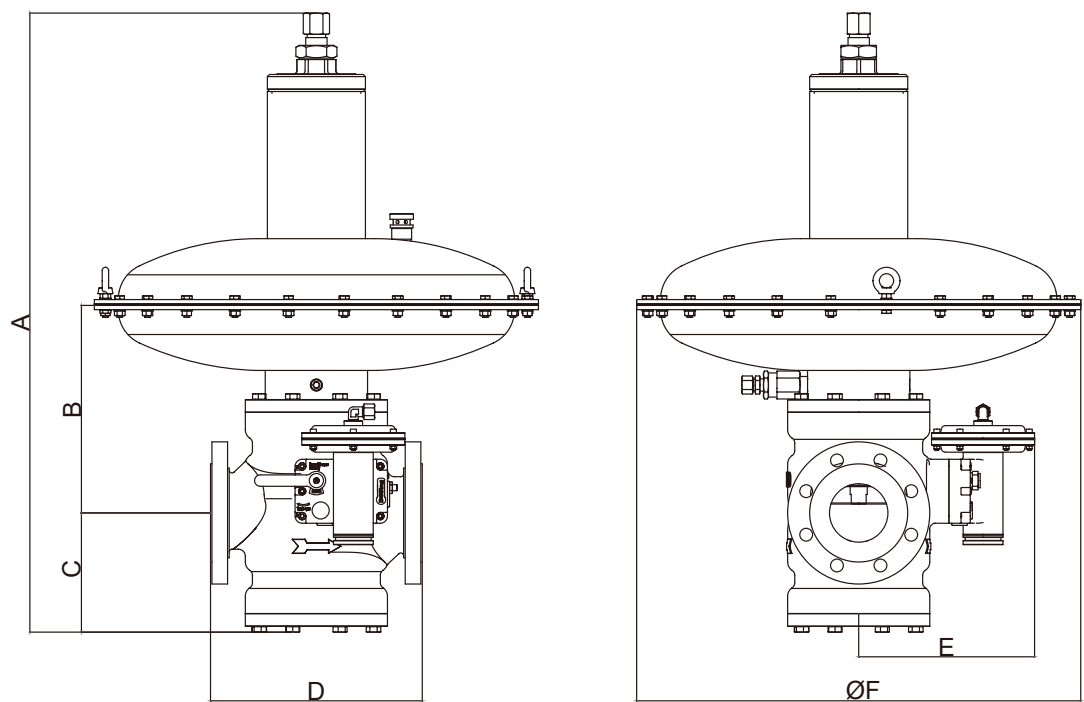


Atmospheric pressure Inlet pressure Outlet pressure



Atmospheric pressure Inlet pressure Outlet pressure

DIMENSIONS



Unit: mm

Model	A	B	C	D	E	F	Weight(Kg)
DA211/DA212	786.8	241.5			230.5	496	70.6
DA213/DA215							
DA214/DA216	775.8	227.6	135.7	254	205.5	378	62.6
DA214TR/DA216TR							
DA311	871	292				625	102.3
DA312	850.3	273			247.5	496	83.2
DA313/DA315			167.7	298			
DA314/DA316	839.3	259.1			222.5	378	75.2
DA314TR/DA316TR							
DA411	930.3	324.5			263.5	625	115.1
DA412	909.6	305.5				496	96.2
DA413/DA415			194.5	352			
DA414/DA416	898.6	291.6			238.5	378	88.3
DA414TR/DA416TR							

FLOW CAPACITY

The size of the regulator is usually selected based on the flow coefficient C_g. 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 (P₁- P₂) ≤ 0.5 (P₁+P_a)]

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

2) Critical state [When (P₁- P₂) > 0.5 (P₁+P_a)]

$$Q=0.526\cdot C_g\cdot(P_1+P_a)$$

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 , 109.6 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:

$$F=\sqrt{\frac{0.61\cdot288}{d\cdot(t+273)}}$$

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

AC10, Capacity in Nm³/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
DA200	0.5	800	850	950	900	900	750	–	–	–	–	–
	0.7	950	1100	1200	1200	1150	1150	1100	–	–	–	–
	1	1250	1300	1500	1650	1550	1500	1400	–	–	–	–
	1.5	1200	1200	2000	2100	2200	2100	2100	1600	–	–	–
	2	1300	1700	1800	2450	2600	2600	2550	2300	–	–	–
	3	1600	1900	2000	3000	3400	3400	3200	3300	2900	–	–
	4	1800	1900	2200	3000	4000	4400	4300	4400	4300	3600	–
	5	1800	1800	2400	3200	5100	5400	5400	5300	5200	5100	4400
	6	–	–	–	–	–	–	6000	6200	6400	6200	5500
	8	–	–	–	–	–	–	6250	7000	8200	8400	8000
	10	–	–	–	–	–	–	7000	7500	9700	9700	10000
	12	–	–	–	–	–	–	8000	8200	11500	11500	12000
	14	–	–	–	–	–	–	9500	8500	13000	13500	13250
	16	–	–	–	–	–	–	10500	9500	15000	15000	15500
DA300	0.5	2000	2000	2500	2200	2300	1800	–	–	–	–	–
	0.7	2400	2600	3000	2800	3100	2400	2300	–	–	–	–
	1	2800	3000	3500	3800	3600	3600	3600	–	–	–	–
	1.5	3500	4000	4600	4600	5000	5000	4800	4200	–	–	–
	2	5000	5000	5500	5500	6500	6000	5750	5500	–	–	–
	3	5000	5000	6000	9000	7500	8000	8200	8500	7500	–	–
	4	5500	6000	6500	9000	8000	10000	10000	10500	10500	8500	–
	5	5500	6000	6500	9000	10000	10000	11000	13000	13500	11500	11000
	6	–	–	–	–	–	–	13000	15000	13000	13000	13000
	8	–	–	–	–	–	–	15000	15000	14000	16000	18000
	10	–	–	–	–	–	–	16000	16000	16000	18000	20000
	12	–	–	–	–	–	–	17000	18000	20000	20000	21000
	14	–	–	–	–	–	–	18000	20000	21000	21000	23000
	16	–	–	–	–	–	–	20000	22000	23000	25000	25000

AC10, Capacity in Nm³/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
DA400	0.5	2400	2500	3300	3300	3300	3000	–	–	–	–	–
	0.7	3000	3400	3800	3800	4200	4000	3800	–	–	–	–
	1	3800	4500	5200	5000	5500	5500	5500	–	–	–	–
	1.5	5000	5500	6500	6500	7000	7000	7000	6500	–	–	–
	2	6000	6000	7000	7500	7000	8000	8500	9000	–	–	–
	3	6000	6000	8000	9000	10000	10000	10000	11000	10000	–	–
	4	6500	7000	8000	9000	10000	11000	12000	14000	14000	14000	–
	5	6500	7000	8000	9000	10000	13000	15000	17000	18000	17000	17000
	6	–	–	–	–	–	–	17000	18000	18000	19000	20000
	8	–	–	–	–	–	–	22000	23000	24000	25000	26000
	10	–	–	–	–	–	–	23000	24000	25000	26000	27000
	12	–	–	–	–	–	–	24000	26000	26000	27000	28000
	14	–	–	–	–	–	–	25000	27000	27000	29000	29000
	16	–	–	–	–	–	–	27000	29000	30000	30000	31000