ESKA

Gas Technologies

ERG H7

Direct Actine Gas Pressure Regulator

ESKA

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About Us

With a deep understanding of the need for manufacturers to be close to gas distribution companies understanding their requirements and providing tailored solutions, ESKA grew to become a leading manufacturer of gas stream equipment. We start every day with a belief that change is constant, and the flexibility to follow that change and provide up to date solutions is crucial in the energy sector.

We manufacture gas stream equipment that are designed based on the needs of our partners. We strive to help gas distribution companies provide safe energy to their clients and to assist our partners with flexible business models that promote mutual growth.

Our commitment is to continually improve our products, ensuring the highest standards of safety and quality at an affordable cost, protecting end users while supporting our partners' success.

60 Years Know-how

Global Reach in 65 Countries

Localized Support

Application Area

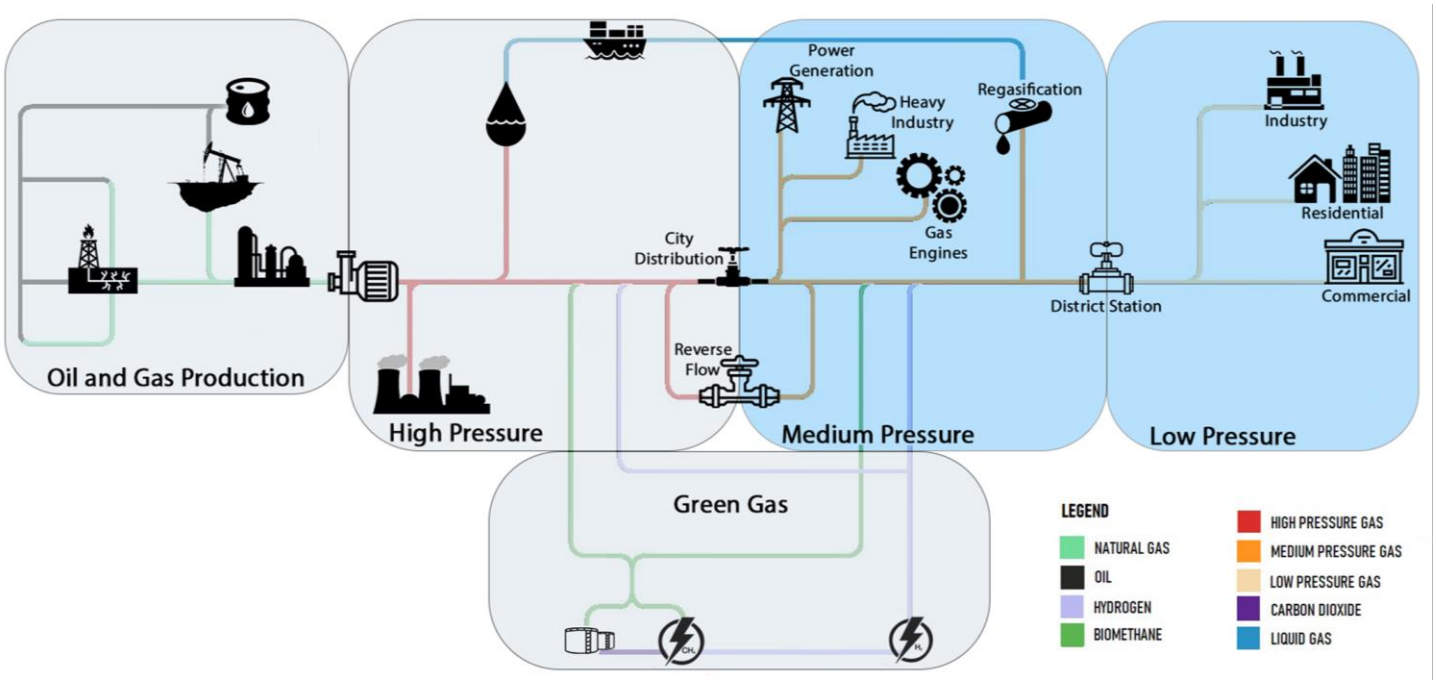


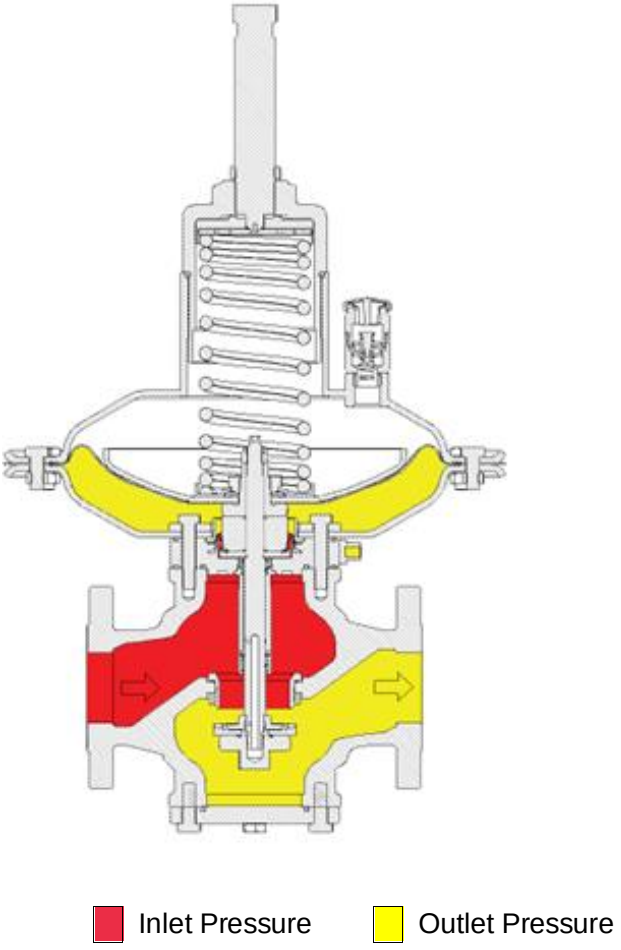
Figure 1: Gas Distribution Map

Area of Service:

Introduction

The ERG-H7 Series is a high-performance, direct-acting gas pressure regulator designed for efficient control of inlet pressure to achieve a stable, desired outlet pressure. It is ideally suited for medium and low-pressure natural gas distribution networks and is also compatible with pretreated non-corrosive gaseous fluids. Widely used in commercial and industrial applications, the ERG-H7 offers optional safety features such as a relief valve, UPSO, and OPSO systems, ensuring reliable and secure operation. Classified as Fail Open, the ERG-H7 complies with the European Standard EN334 and is engineered for versatility and durability in demanding environments.

Figure 2: ERG H7 Pressure Regulation



Features

The ERG-H7 is a direct-acting gas pressure regulator designed for medium to high-pressure applications in both domestic and industrial settings. It effectively reduces inlet pressures ranging from 1 to 20 bar to desired outlet pressures between 21 mbar and 4.5 bar, ensuring precise control with an accuracy class of AC10 (±10%). The regulator features a lock-up pressure tolerance of up to +10% and can be equipped with safety mechanisms such as overpressure shut-off (OPSO), under pressure shut-off (UPSO), and a relief valve. Operating efficiently within a standard temperature range of -20°C to +60°C, the ERG-H7 also offers a low-temperature variant capable of functioning at temperatures as low as -40°C. Its inline flow direction and "top entry" design facilitate easy maintenance without the need to remove the body from the pipeline.

In practical applications, the ERG-H7 is particularly beneficial in natural gas distribution networks, where maintaining consistent pressure is crucial for safety and efficiency. For instance, in industrial facilities utilizing gas-fired equipment, the ERG-H7 ensures that machinery receives gas at optimal pressures, thereby enhancing performance and reducing the risk of equipment damage due to pressure fluctuations.

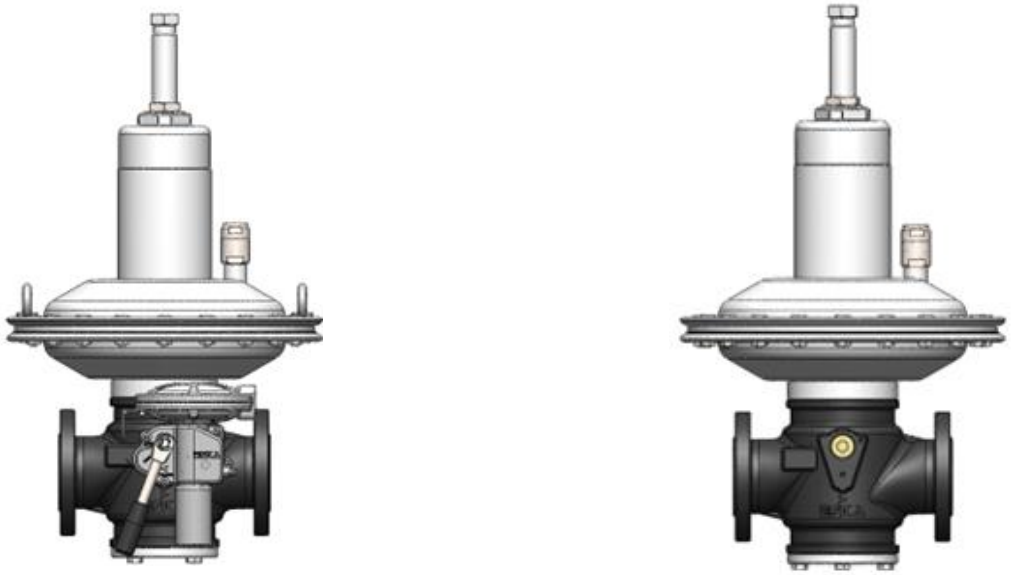


Figure 3: ERG H7/HZ7

Characteristics

Table 1: ERG H7 Series characteristics

Feature	Values			
Design Pressure	PS4, PS6, PS10, PS16, PS20			
Inlet Pressure	0,5 to 20 bar or 0,1 to 20 bar[1]			
Flow	Max 22500 m^3/h (Natural Gas)			
Head Type (mm)	Ø500		Ø380	
	LPO Version	**MPO Version**	**MPO Version**	**HPO Version**
Outlet Pressure Range (Wd)	15-80 mbar	80-340 mbar	80-340 mbar	340-4400 mbar
Safety shut-off Pressure Range (Wdo)	30-5500 mbar			
Safety shut-off Pressure Range (Wdu)	10-3200 mbar			
Accuracy Class (AC)	±5% AC5[1], ±10% AC10 or ±20% AC20[1]			
Lock-up over pressure (SG)	+%10 SG10[1], +%20 SG20, +%30 SG30[1]			
	Standard Versions		LT Version[2]	
Ambient temperature	-10°C to 60°C	-20°C to 60°C	-40°C to 60°C[3]	
Configuration	Inline			
Connections	Flanged DN50 - DN80, PN16/PN20 or Class 150			

[1] Upon request
[2] The stated value is the temperature at which the device's mechanical resistance and leakage are tested. Extra body parts may not be suitable for that version.
[3] The standard inlet and outlet pressure are set as per EN 334 standard.

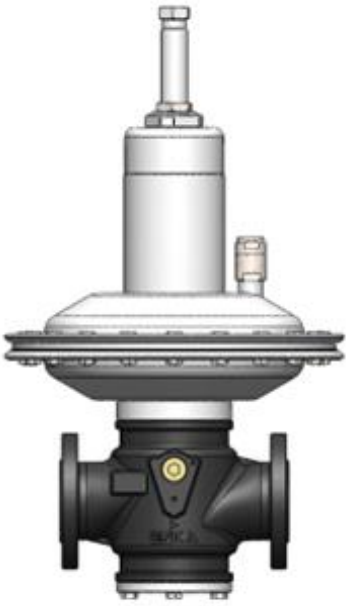


Figure 4: ERG HZ6

Materials

Table 2: ERG H7 Series Materials

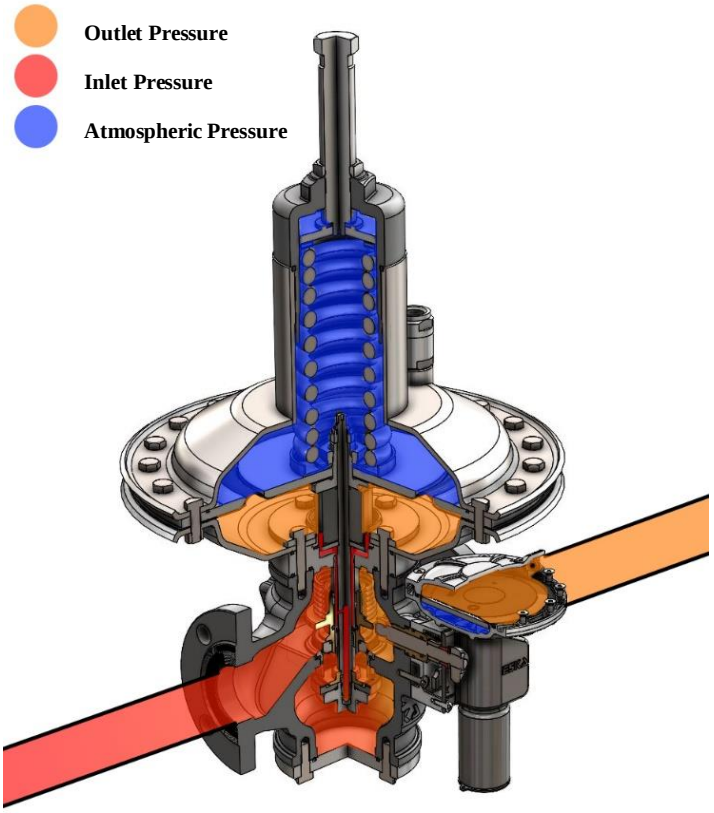
Part	Material*	Standard
Body	Cast Iron EN GJS 400-15 (GGG40)	EN 1563
Seat	Brass	EN 12164 and/or 12165
Cover	Rolled and Forged Steel	EN10025-2
Diaphragm	Elastomer, Fabric-Reinforced and Non-Reinforced NBR	EN 549

*Above materials are listed for standard models. For other request please refer to our sales team or your local distributer.

Approvals

The ERG H7 regulator is meticulously designed in compliance with the European standard EN 334, guaranteeing exceptional performance and reliability. It incorporates a fail-open mechanism that ensures safety and efficiency, responding dynamically to pressure variations as per EN 334 requirements. Furthermore, the ERG H7 is certified under the European Directive 2014/68/EU (PED), demonstrating its conformity to rigorous safety and pressure equipment standards.

EN334 **EN 14382** **PED**



Technical Data

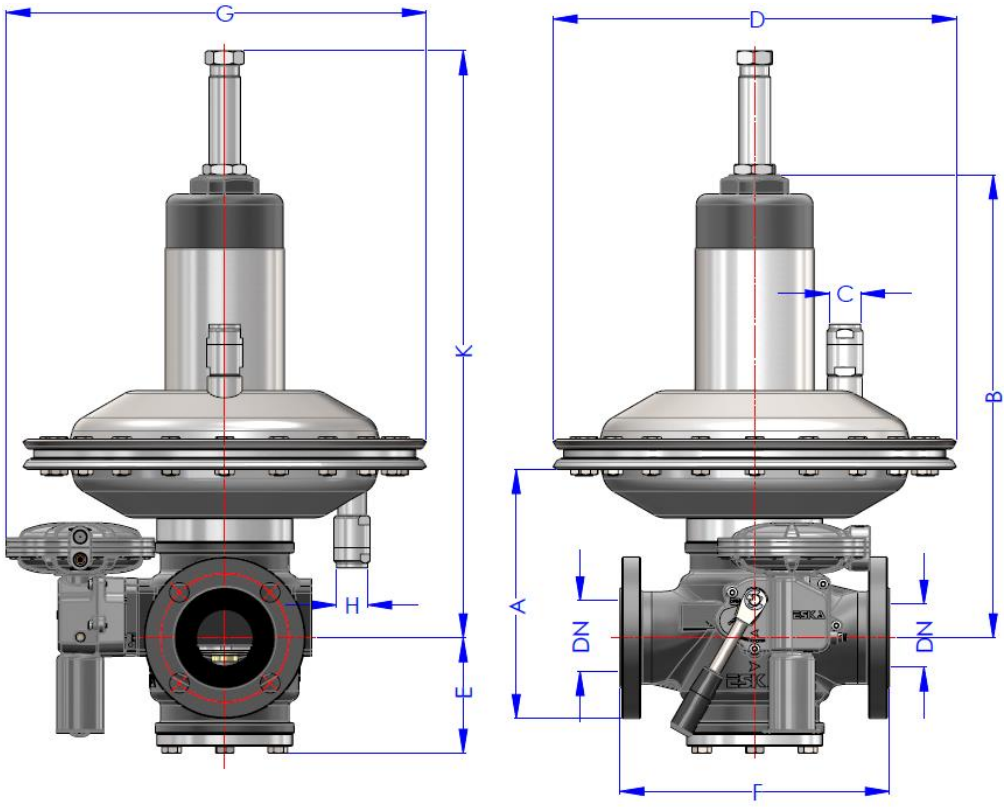


Figure 5: ERG H7 Technical Dimensions

Type	DN	A	B	C	D	E	F	G	Kmin	Kmax	H
LP	50	260	471,2	G 1/4"	500	108,6	254	456,2	508	605,7	G 1/4"
MP	50	234,5	427,5	G 1/4"	380	108,6	254	396,2	462,3	560	G 1/4"
	80	304,2	497,4	G 1/4"	500	131,5	298	474,2	534,2	631,9	G 1/4"
HP	50	234,5	436	G 1/4"	380	108,6	254	396,2	470,8	568,5	G 1/4"
	80	278,7	460,2	G 1/4"	380	131,5	298	414,2	495,1	592,7	G 1/4"

Table 3: ERG H7 Dimensions

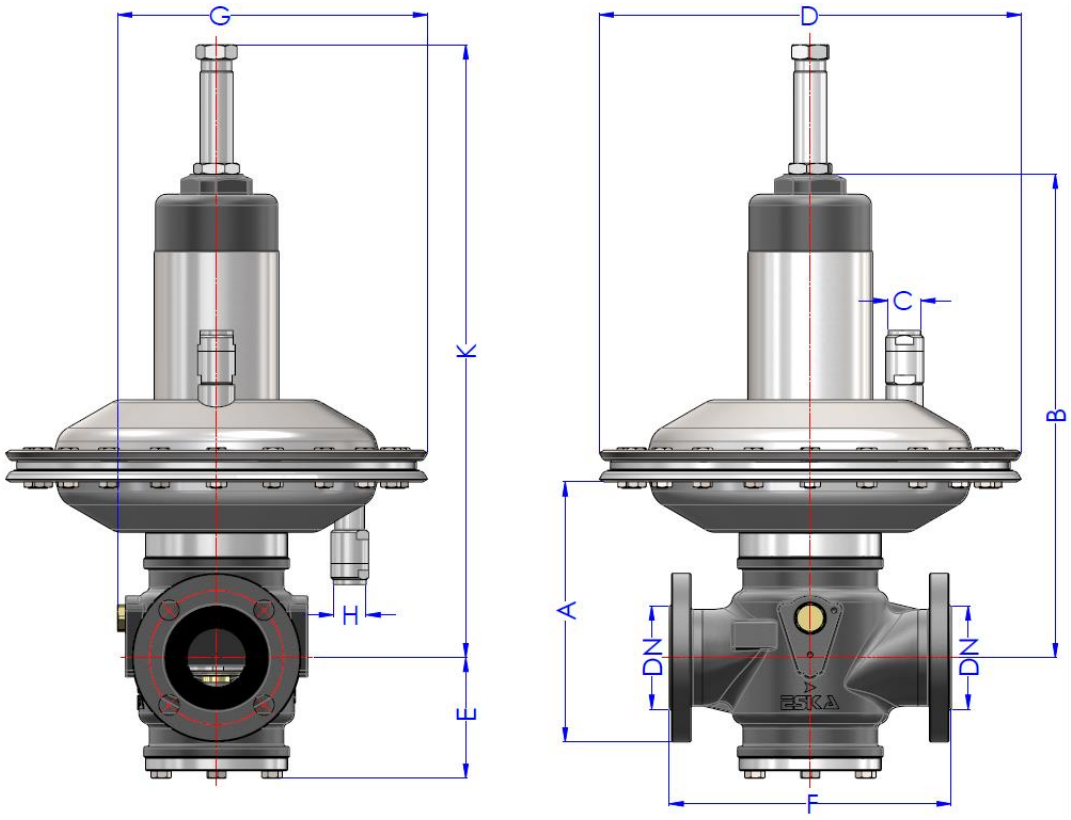


Figure 6: ERG HZ7 Technical Dimensions

Type	DN	A	B	C	D	E	F	G	Kmin	Kmax	H
LP	50	260	471,2	G 1/4"	500	108,6	254	339,1	508	605,7	G 1/4"
MP	50	234,5	427,5	G 1/4"	380	108,6	254	279,1	462,3	560	G 1/4"
	80	304,2	497,4	G 1/4"	500	131,5	298	474,2	534,2	631,9	G 1/4"
HP	50	234,5	436	G 1/4"	380	108,6	254	279,1	470,8	568,5	G 1/4"
	80	278,7	460,2	G 1/4"	380	131,5	298	297,1	495,1	592,7	G 1/4"

Table 4: ERG HZ7 Dimensions

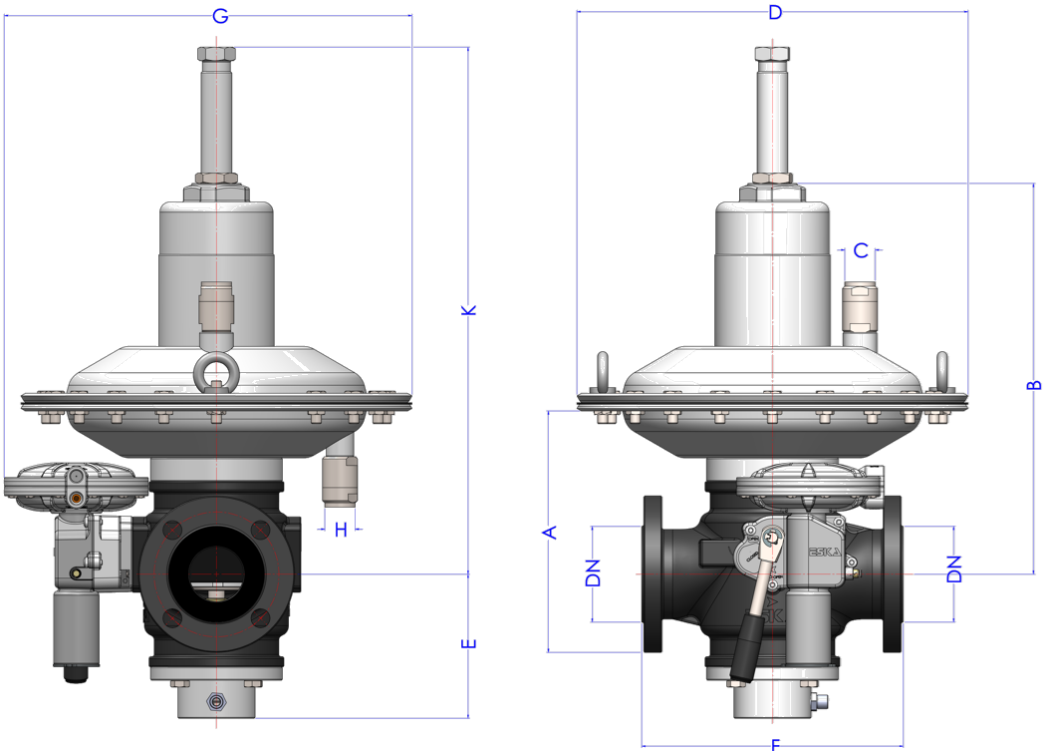


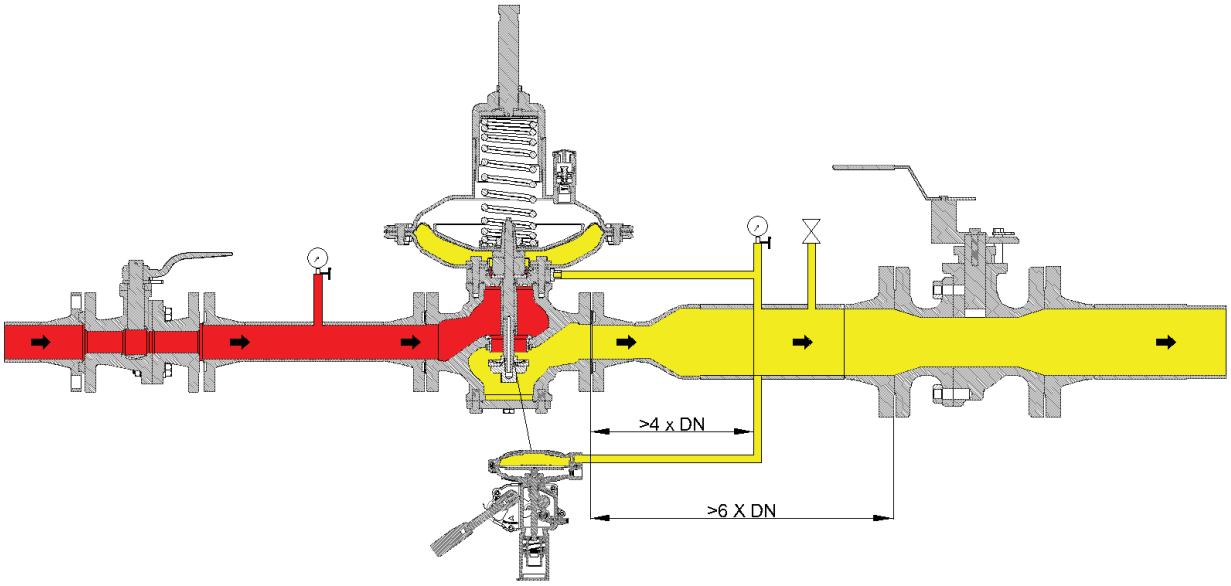
Figure 7: ERG H7 Monitor Technical Dimensions

Type	DN	A	B	C	D	E	F	G	Kmin	Kmax	H
MP	50	234,5	427,5	G 1/4"	380	140	254	396,2	462,3	560	G 1/4"
HP	80	278,7	460,2	G 1/4"	380	167,4	298	414,2	495,1	592,7	G 1/4"

Table 5: ERG H7 Monitor Dimensions

Installation Options

Standard Regulator

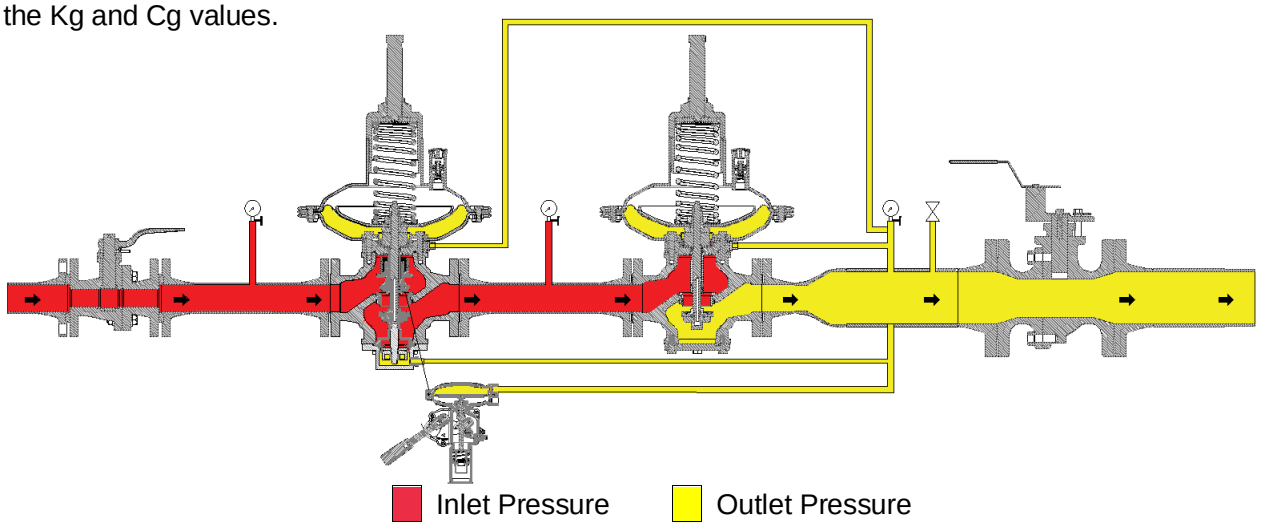


In-Line Monitor

The monitor regulator is installed on the line before the active regulator.

Although the function of the monitor regulator is different, the two regulators are almost identical in terms of mechanical components. The only difference is that the monitor regulator is set to a higher pressure than the active regulator.

The flow rate of the monitor regulator is lower than that of the active regulator. Therefore, losses of approximately 10-20% occur in the Kg and Cg values.



Calculations

While selecting the regulator, a sufficient safety factor should always be left in terms of capacity, and a regulator with a capacity at least 10% higher than the maximum capacity of the line should be selected. As the density of the gas increases, the gas velocity, that is, the flow rate, decreases because the gas becomes heavier.

Standard Conditions for Sakarya/Turkey: 25°C and 1,01325 bar.

Normal Conditions in General: 273,15 K (0°C) and 1,01325 bar.

The conversion from standard conditions to normal conditions is calculated approximately by the formula on the side;

N m^3/h = 0,94795 x St m^3/h

Specific weight of air: 1,293 kg/m^3

Specific weight of natural gas according to EN 334: 0,8275 kg/m^3

Specific weight of natural gas according to Turkey: 0,78 kg/m^3

Capacity Change Formula According to Gas Type;

For conversion from X gas → Y gas

$$\textit{Flow rate of Y gas m3/h} = \textit{Flow rate of X gas m3/h} \times \sqrt{\frac{\textit{Specific Weight of X Gas kg/m}^3}{\textit{Specific Weight of Y Gas kg/m}^3}}$$

Cg / Kg Formula;

KG; fully opened valve, t=15°C gas inlet temperature, 0.83 kg/m^3 special weight natural gas (natural gas with d = 0.64 density ratio), inlet pressure: Inlet pressure (Pu + 1.013) and outlet pressure as absolute pressure: As absolute pressure, it is calculated with the phase of inlet pressure (Pd + 1.013).

When calculation is required for flow rate and diameter selection of a regulator, the following calculations based on the regulator's Cg and KG coefficients are used. These calculations are valid for fully open position and for different operating conditions.

Qn = Flow Rate (S m^3/h)

P_u = Inlet pressure bar abs (atmospheric pressure added)

P_d = Outlet pressure bar abs (atmospheric pressure added)

K1 = Body form factor (unitless)

Cg = Flow coefficient

KG = Flow coefficient

NOTE: Sin value should be taken in degrees.

1. CONDITION: If the Cg and KG values and Pu and Pd are known, the flow rate is calculated as:

subcritical conditions: (Pu<2xPd) => $Q = K_G \times \sqrt{Pd \times (Pu-Pd)}$ $Q = 0.526 \times Cg \times Pu \times \text{sen}\left(K1 \times \sqrt{\frac{Pu-Pd}{Pu}}\right)$

critical conditions: (Pu≥2xPd) => $Q = \frac{K_G}{2} \times Pu$ $Q = 0.526 \times Cg \times Pu$

2. CONDITION: Once the Pu, Pd and Q values are known, the Cg and KG and the regulator diameter are calculated by the formula:

subcritical conditions: (Pu<2xPd) => $K_G = \frac{Q}{\sqrt{Pd \times (Pu-Pd)}}$ $Cg = \frac{Q}{0.526 \times Pu \times \text{sen} \times \left(K1 \times \sqrt{\frac{Pu-Pd}{Pu}}\right)}$

critical conditions: (Pu≥2xPd) => $K_G = \frac{2 \times Q}{Pu}$ $Cg = \frac{Q}{0,526 \times Pu}$

Nominal Diameter	DN50	DN80
	2”	3”
Cg Coefficient	1300	3360
KG Coefficient	1400	3540
K1 Coefficient	105	105

Table 6: ERG H7 Calculation Coefficient

The following equation should be used to convert the natural gas flow rate to different gas flow rates.

Q natural gas m³/h x K = Qxgas m³/h

In this equation;

Q natural gas m³/h: Natural Gas Flow Rate (Taken from the capacity given in this manual for different inlet and outlet pressures)

K: Correction Factor (Taken from the table below)

Qxgas m³/h : X Gas Flow Rate Desired

Example: In order to convert the natural gas flow rate to air flow rate, it is taken as K:0.78 (from the table below). To find the equivalent of 128m3/h natural gas flow in air flow

Qnaturalgas m³/h x 0,78 = Qair m³/h

128 x 0,78 : 100 m³/h air

Adjustment Factor K at 15ºC	
Butane	0,55
Propene	0,64
Oxygen	0,76
Air	0,78
Nitrogen	0,81
Biogas	0,85
City Gas	1,23
Hydrogen	3,04
LPG	0,62

Condition: +15°C, 1013 mbar,

Q (n)m³/h (Natural Gas) x K = Q (n)m³/h (x Gas)

Example: Q (n)m³/h (Natural Gas) x 0,78 = Q (n)m³/h (Air)

Formula for Finding Gas Velocity at the Outlet:

In order to get the best performance from the product, to avoid premature wear and to limit sound emission, it is recommended that the gas velocity at the outlet flange does not exceed 150 m/s.

$$V = 345{,}92 \times \frac{Q}{DN^2} \times \frac{1-0{,}002 \times Pd}{1+Pd}$$

V : Gas Velocity (m/sn)

Q : Flow Rate (Stm³/h)

DN : Nominal Diameter of Regulator (mm)

Pds : Output pressure (barg)

Capacity Table

ESKA H7 DN50 (2”)																									
Inlet Pressure			Outlet Pressure																						
			LP (Head Diameter:500 mm)						MP (Head Diameter:380 mm)				HP (Head Diameter:380 mm)												
			0,02 bar / 2 kPa		0,05 bar / 5kPa		0,08 bar / 8 kPa		0,1 bar / 10 kPa		0,3 bar / 30 kPa		0,5 bar / 50 kPa		0,75 bar/75 kPa		1 bar / 100 kPa		1,5 bar/150 kPa		2 bar / 200 kPa		3 bar / 300 kPa		4 bar / 400 kPa	
barg	PSI	mPa	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h
0,2	2,9	0,02	520	592,8	480	547,2	430	490,2	410	467,4	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-
0,3	4,35	0,03	650	741	630	718,2	580	661,2	580	661,2	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-
0,5	7,25	0,05	880	1003,2	860	980,4	830	946,2	830	946,2	580	661,2	-	-	-		-	-	-	-	-	-	-	-	-	-
0,75	10,88	0,075	930	1060,2	1080	1231,2	1080	1231,2	1030	1174,2	880	1003,2	680	775,2	-		-	-	-	-	-	-	-	-	-	-
1	14,5	0,1	980	1117,2	1280	1459,2	1280	1459,2	1280	1459,2	1180	1345,2	1030	1174,2	730	832,2	-	-	-	-	-	-	-	-	-	-
1,5	21,75	0,15	1130	1288,2	1680	1915,2	1680	1915,2	1680	1915,2	1630	1858,2	1530	1744,2	1430	1630,2	1130	1288,2	-	-	-	-	-	-	-	-
2	29	0,2	1180	1345,2	1860	2120,4	1980	2257,2	1830	2086,2	1980	2257,2	1980	2257,2	1880	2143,2	1680	1915,2	1380	1573,2	-	-	-	-	-	-
4	58	0,4	1180	1345,2	1950	2223	2480	2827,2	1830	2086,2	3180	3625,2	3280	3739,2	3380	3853,2	3380	3853,2	3380	3853,2	3180	3625,2	2380	2713,2	-	-
6	87	0,6	1300	1482	1980	2257,2	2480	2827,2	1730	1972,2	3380	3853,2	4280	4879,2	4780	5449,2	4680	5335,2	4680	5335,2	4780	5449,2	4480	5107,2	3680	4195,2
8	116	0,8	1460	1664,4	2030	2314,2	2480	2827,2	1760	2006,4	3580	4081,2	4280	4879,2	4980	5677,2	5980	6817,2	6080	6931,2	6180	7045,2	6080	6931,2	5780	6589,2
10	145	1	1580	1801,2	2180	2485,2	2780	3169,2	1760	2006,4	3680	4195,2	4280	4879,2	4980	5677,2	5980	6817,2	6980	7957,2	7480	8527,2	7480	8527,2	7480	8527,2
12	174	1,2	1730	1972,2	2330	2656,2	2930	3340,2	1910	2177,4	3830	4366,2	4430	5050,2	5130	5848,2	6130	6988,2	7130	8128,2	7630	8698,2	7630	8698,2	7630	8698,2
19	275,5	1,9	2250	2565	2730	3112,2	2980	3397,2	2330	2656,2	3680	4195,2	4280	4879,2	4980	5677,2	5980	6817,2	6980	7957,2	8480	9667,2	10480	11947,2	12000	13680
* Values in the table are for AC10. * Kg/h values are for LPG																										

Table 7: ERG-H7 DN50 and ERG-HZ7 DN50 Capacity Table

ESKA H7 DN 80 (3”)																										
Inlet Pressure			Outlet Pressure																							
			LP						MP (Head Diameter:500 mm)				HP (Head Diameter:380 mm)													
			0,02 bar / 2 kPa		0,05 bar / 5kPa		0,08 bar / 8 kPa		0,1 bar/10 kPa		0,3 bar / 30 kPa		0,5 bar/50 kPa		0,75 bar/7 kPa		1 bar / 100 kPa		1,5 bar/150kPa		2 bar / 200 kPa		3 bar / 300 kPa		4 bar / 400 kPa	
barg	PSI	mPa	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h	Sm³/h	Kg/h
0,2	2,9	0,02	-	-	-	-	-	-	1100	1254	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0,3	4,35	0,03	-	-	-	-	-	-	1450	1653	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0,5	7,25	0,05	-	-	-	-	-	-	2100	2394	1550	1767	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0,75	10,88	0,075	-	-	-	-	-	-	2750	3135	2430	2770,2	1800	2052	-	-	-	-	-	-	-	-	-	-	-	-
1	14,5	0,1	-	-	-	-	-	-	2850	3249	2650	3021	2550	2907	1950	2223	-	-	-	-	-	-	-	-	-	-
1,5	21,75	0,15	-	-	-	-	-	-	3950	4503	3600	4104	3550	4047	3500	3990	2950	3363	-	-	-	-	-	-	-	-
2	29	0,2	-	-	-	-	-	-	4650	5301	5150	5871	5050	5757	4550	5187	4360	4970,4	3650	4161	-	-	-	-	-	-
2,5	36,26	0,25	-	-	-	-	-	-	4950	5643	6300	7182	6850	7809	5250	5985	5600	6384	6150	7011	3400	3876	-	-	-	-
4	58	0,4	-	-	-	-	-	-	5450	6213	7450	8493	8750	9975	7550	8607	8000	9120	8250	9405	8000	9120	6100	6954	-	-
6	87	0,6	-	-	-	-	-	-	5600	6384	8200	9348	11000	12540	10000	11400	10500	11970	12000	13680	12000	13680	10000	11400	9500	10830
8	116	0,8	-	-	-	-	-	-	5100	5814	9400	10716	11000	12540	11000	12540	13000	14820	14000	15960	15000	17100	15000	17100	14500	16530
10	145	1	-	-	-	-	-	-	5300	6042	9400	10716	11000	12540	12000	13680	15200	17328	16000	18240	19000	21660	18000	20520	19000	21660
12	174	1,2	-	-	-	-	-	-	5550	6327	9500	10830	11700	13338	13000	14820	15200	17328	16000	18240	19000	21660	20000	22800	20000	22800
19	275,5	1,9	-	-	-	-	-	-	5650	6441	9600	10944	11800	13452	13100	14934	15300	17442	16100	18354	20000	22800	22000	25080	22000	25080
* Values in the table are for AC10. * Kg/h values are for LPG																										

Table 8: ERG-H7 DN80 and ERG-HZ7 DN80 Capacity Table

Regulation Spring Table

Regulation Spring		LP Spring Range (mbar) (Head Type: Ø500) DN50		MP Spring Range (mbar) (Head Type: Ø500) DN80		MP Spring Range (mbar) (Head Type: Ø380) DN50		HP Spring Range (mbar) (Head Type: Ø380) DN50/DN80	
Spring Code	Spring Color	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
PDM00006699	Uncolored	15	50	-	-	80	120	-	-
PDM00008090	White	50	80	-	-	-	-	-	-
PDM00008091	Green	-	-	80	100	120	200	-	-
PDM00008092	Blue	-	-	100	120	200	340	-	-
PDM00006917	Yellow	-	-	120	200	-	-	340	800
PDM00008093	Black	-	-	200	340	-	-	-	-
PDM00008384	Brown	-	-	-	-	-	-	800	1200
PDM00008094	Pink	-	-	-	-	-	-	1200	1600
PDM00008095	Grey	-	-	-	-	-	-	1600	3000
PDM00008096	Orange	-	-	-	-	-	-	3000	3600
PDM00001758	Red	-	-	-	-	-	-	3600	4400

Table 9: ERG H7 Series Regulation Spring Table

OPSO Spring Table

OPSO Spring		LP Spring Range (mbar) (Head Type: Ø500) DN50		MP Spring Range (mbar) (Head Type: Ø500) DN80		MP Spring Range (mbar) (Head Type: Ø380) DN50		HP Spring Range (mbar) (Head Type: Ø380) DN50/DN80	
Spring Code	Spring Color	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
PDM00008120	Green	30	60	-	-	-	-	-	-
PDM00008121	Blue	60	120	120	180	120	180	-	-
PDM00008122	Yellow	-	-	180	250	180	250	-	-
PDM00008123	Black	-	-	250	450	250	450	450	700
PDM00008124	Pink	-	-	-	-	-	-	700	1700
PDM00008125	Grey	-	-	-	-	-	-	1700	2700
PDM00008126	Orange	-	-	-	-	-	-	2700	5000
PDM00008127	Red	-	-	-	-	-	-	5000	5500

Table 10: ERG H7 OPSO Spring Table

UPSO Spring Table

UPSO Spring		LP Spring Range (mbar) (Head Type: Ø500) DN50		MP Spring Range (mbar) (Head Type: Ø500) DN80		MP Spring Range (mbar) (Head Type: Ø380) DN50		HP Spring Range (mbar) (Head Type: Ø380) DN50/DN80	
Spring Code	Spring Color	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
PDM00008128	Uncolored	10	30	-	-	-	-	-	-
PDM00008129	White	30	80	40	80	40	80	-	-
PDM00008130	Green	-	-	80	140	80	140	-	-
PDM00008131	Blue	-	-	140	160	140	160	350	450
PDM00008132	Yellow	-	-	160	240	160	240	450	700
PDM00008133	Black	-	-	-	-	-	-	700	1100
PDM00008134	Grey	-	-	-	-	-	-	1100	1500
PDM00008135	Orange	-	-	-	-	-	-	1500	2000
PDM00008136	Red	-	-	-	-	-	-	2000	3200

Table 11: ERG H7 Series UPSO Spring Table

Packaging

Product	Number or Items	Box Dimensions (LxWxH cm)	Unit Weight	Pallet Total Items	Pallet Total Weight
ERG-H7 Ø380	1	43x43x80	Approx. 63,8 kg	4	255,2 kg
ERG-HZ7 Ø500	1	55x51x82	Approx. 67,2 kg	4	268,8 kg

Table 12: ERG H7 Series Packing Information

ESKA

ERG-H7
USER MANUAL

This manual is subject to change according to technical developments.

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