

PRESSURE REGULATORS

Type A/140



A/140 Regulators

A/140 Series Pressure Regulator

The regulators of the A/140 series due to their operating specifications are mainly used in those system where sudden capacity variations are required, or else, where the cut-off of the gas distribution is controlled by solenoid valve, such as for the feeding of burners. They can be used with natural gas, manufactured gas, air, propane and other gases, as long as they do not contain a high percentage of benzole.

The A/140 series regulators are spring controlled single seated, whit counterbalanced valve disc. They are usually supplied with safety valve and built in filter and can be also provided with shut-off device for minimum pressure, maximum pressure or minimum and maximum downstream pressure.

The regulators of the series A/140 have been devised keeping in consideration the functionality of maintenance, in fact is possible to replace the seat or the seals without removing the body from the line.

Main features:

- **Counterbalanced valve**
- **Available with or without relief valve**
- **AE/149 and AE/149-AP monitor version available**
- **Overpressure and underpressure slam shut valve**
- **Manual reset**

Configurations

Version Without Shut-off Device



A/142



A/142-AP

Version With Shut-off Device



A/149



A/149-AP

Regulator Operation

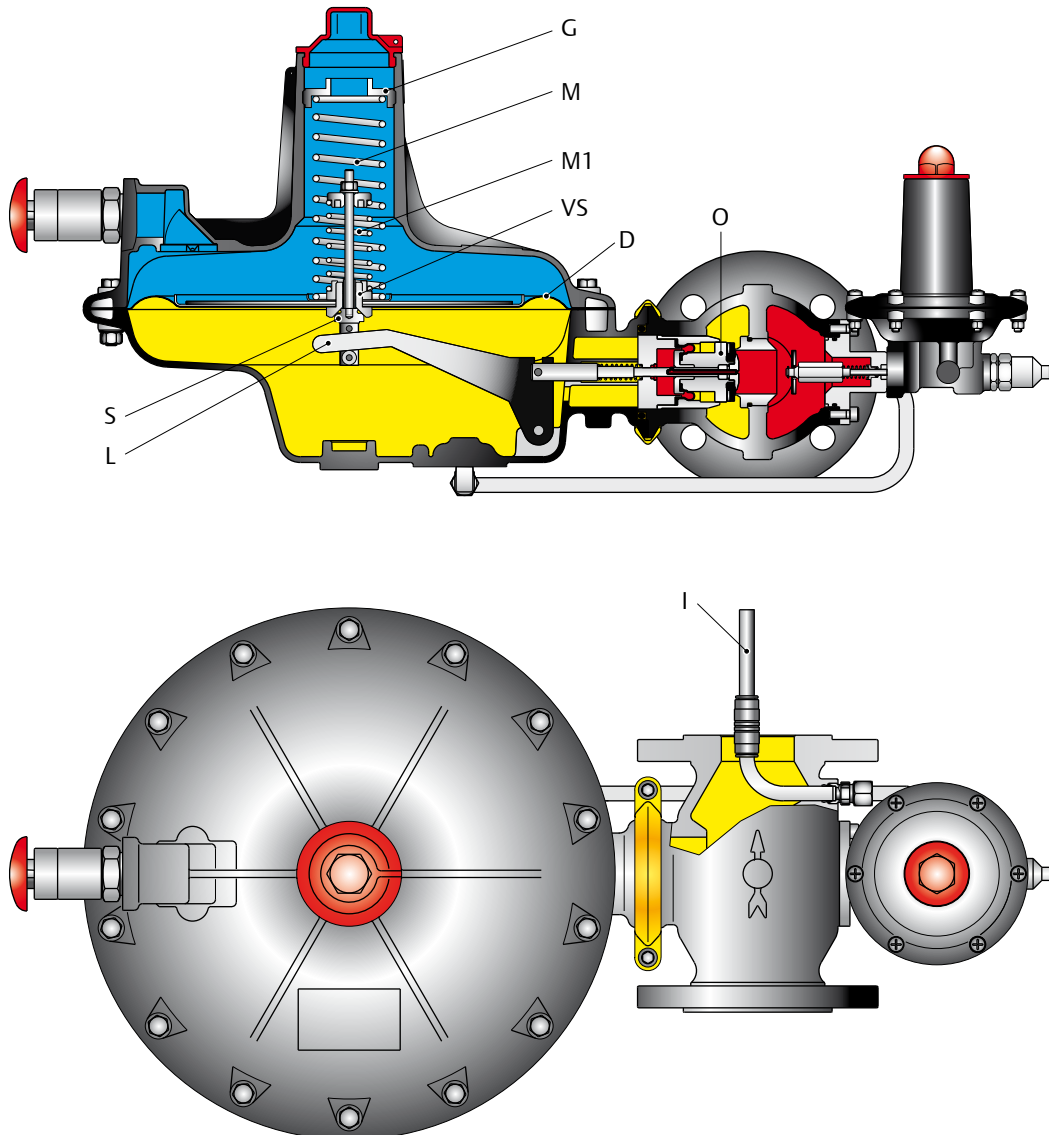
The movements of the diaphragm (D) are transmitted to the valve disc (O) by the stem (S) and the lever (L).

The downstream pressure through the pulse pipe (I) exerts a force under diaphragm (D) and this force is counteracted by the adjusting spring (M).

The gas pressure on the diaphragm tends to close the valve disc; the antagonist action of the adjustment spring tends to open it. Under normal conditions the balance between these antagonist actions positions the valve disc in such a way as to ensure a constant pressure and therefore the downstream capacity.

Upon any capacity variation tending to cause an increase or decrease of pressure in relation to the pre-set pressure, the moving unit reacts and finds a new balance, so re-establishing the pressure.

Upon request the regulator is also provided with safety valve (VS) incorporated in the diaphragm (D); the adjustment at the pre-set value is performed by means of spring (M1).



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Shut-off Device Operation

The A/140 series pressure regulators can be fitted with an OS/66 slam-shut valve.

This safety device operates independently of the regulator and, according to customer request, can be made to trigger by any pressure variation, whether above or below set point, or by both.

Outlet pressure acting upon diaphragm (D) is counteracted by maximum pressure spring (M2), thus overcoming the action of the minimum pressure valve (M3).

Under such conditions, the moving part (E) of the valve is held in balance so that lever (L) is aligned with the projecting part of lever (L1).

In addition, the balls (S) are held in their seat by bush (B) and, in turn, these hold the valve disc (O) open.

Any outlet pressure variation over and above preset value breaks the existing balance.

In fact, in case of an increase in outlet pressure, spring (M2) load is overcome by pressure load; in case of a decrease in outlet pressure, spring (M3) load overcomes pressure load.

In both cases, moving part (E) is activated, causing lever (L) to move with it so that lever (L) is no longer aligned with lever (L1).

In this way, lever (L1) releases balls (S), thereby allowing valve disc (O) to close under the action of spring (M4).

The safety device is fitted with an internal by-pass for easy resetting even in case of high inlet pressure. For resetting, proceed as follows: Remove rear cap (C), screw it to stem (H) and pull outwards. Allow a few moments for inlet pressure to flow downstream.

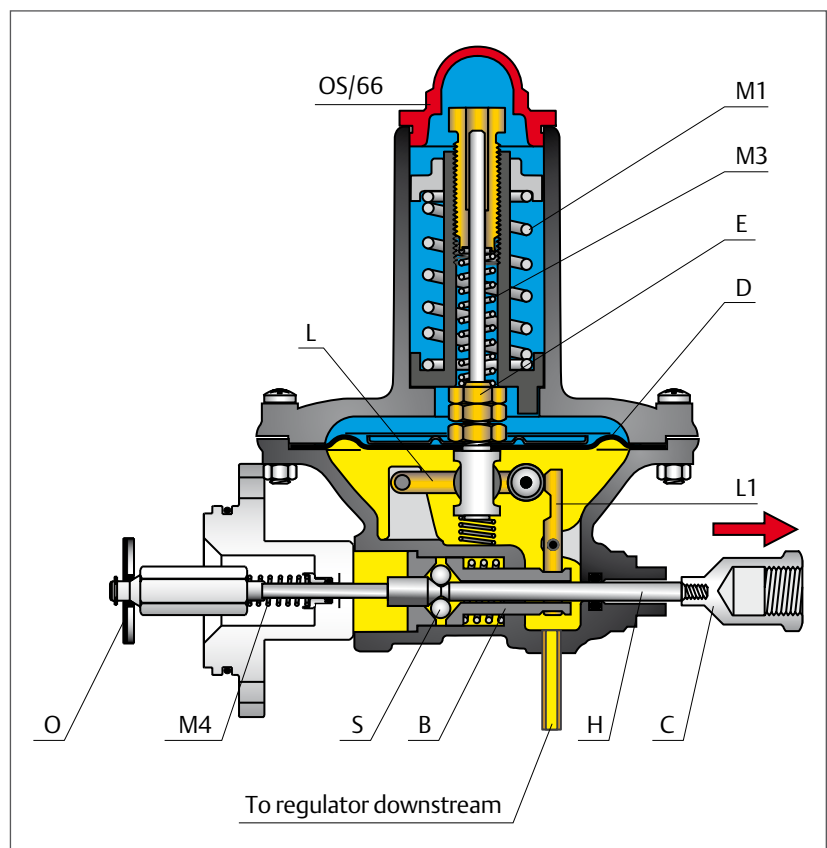
Next, pull cap fully outwards.

Allow a few moments for outlet pressure to stabilize.

Next, release cap and make sure that device remains in the reset position.

If not, repeat the above steps. Once reset, replace cap in its initial position.

The maximum and minimum trip values are independently set by springs (M2) and (M3), respectively.



Features

Technical Features

Body allowable pressure	PS	: up to 20 bar
Highest operating pressure	P_{\max}	: 300 mbar
Maximum Operating Inlet Pressure	$P_{u_{\max}}$: 6 bar
Inlet pressure range	bpu	: 0.1 to 6 bar
Outlet Set Pressure Ranges	Wd	: 10 to 300 mbar

Functional Features

Accuracy class	AC	: up to $\pm 5\%$
Lock-up pressure class	SG	: up to +10%
Maximum capacity	Q_{\max}	: up to 900 Stm ³ /h

Shut-off device Independent pneumatic control

Accuracy class	AG	: $\pm 5\%$
Response time	t_a	: ≤ 1 second

Orifice

30 mm

Body Sizes and End Connection Styles

DN 50 PN 16 UNI/DIN

Temperature

Standard version	: Working -10° to 60°C
Low temperature version	: Working -20° to 60°C

Versions

Versions without relief valve available on request
Tightness cover versions available on request (e.g. A/149-D)

Materials

Servomotor body	Aluminium
Cover	Aluminium
Body	Ductile iron (steel available on request)
Sleeve	Brass
Seat	Brass
Diaphragm	Fabric Nitrile (NBR)
Gaskets	Nitrile (NBR) rubber

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Slam-Shut Device

The following slam-shut devices are used with A/140 series regulators with built-in shut-off device:

- OS/66 Spring loaded

Technical Features

Model	Servomotor Body Resistance (bar)	Overpressure Set Range W_{do} (bar)		Underpressure Set Range W_{du} (bar)	
		Min.	Max.	Min.	Max.
OS/66	6	0.022	0.6	0.007	0.450
OS/66-AP		0.2	5	0.1	2.5



Materials	Body	Aluminium
	Cover	Steel
	Diaphragm	NBR Rubber

Flow Table Stm^3/h

Following flow tables (referred to Natural Gas) are advised for an optimal use of the A/140 series regulators.

For other gases with different densities, the flow rate must be multiplied by the correction factor:

$$F = \sqrt{\frac{0.6}{d}}$$

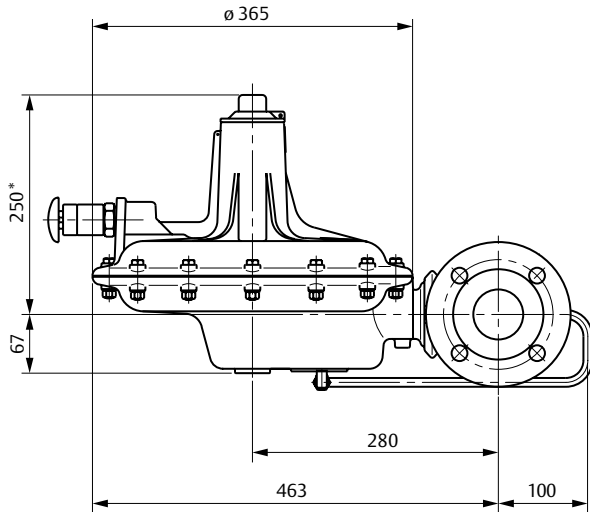
Gas	Relative Density d	Factor F
Air	1	0.78
City gas	0.44	1.17
Butane	2.01	0.55
Propane	1.53	0.63
Nitrogen	0.97	0.79
Carbon dioxide	1.52	0.63
Hydrogen	0.07	2.93

Outlet Pressure mbar	Inlet Pressure bar																
	0.03	0.05	0.075	0.1	0.15	0.2	0.3	0.4	0.5	0.75	1	1.5	2	3	4	5	
Standard	15	50	80	100	120	150	170	220	250	280	340	400	500	600	650	750	900
	20	-	75	100	120	150	170	220	250	280	340	400	500	600	650	750	900
	30	-	60	90	110	150	170	220	250	280	340	400	500	600	650	750	900
	40	-	-	80	100	140	170	210	250	280	340	400	500	600	650	750	900
	50	-	-	70	90	140	160	210	240	270	340	400	500	600	650	750	900
	75	-	-	-	-	120	150	200	240	270	340	400	500	600	650	750	900
AP	100	-	-	-	-	100	140	190	230	250	340	400	500	600	650	750	900
	150	-	-	-	-	-	100	170	220	250	330	390	500	600	650	750	900
	200	-	-	-	-	-	-	140	200	240	330	390	500	600	650	750	900
	300	-	-	-	-	-	-	-	150	210	310	380	500	600	650	750	900

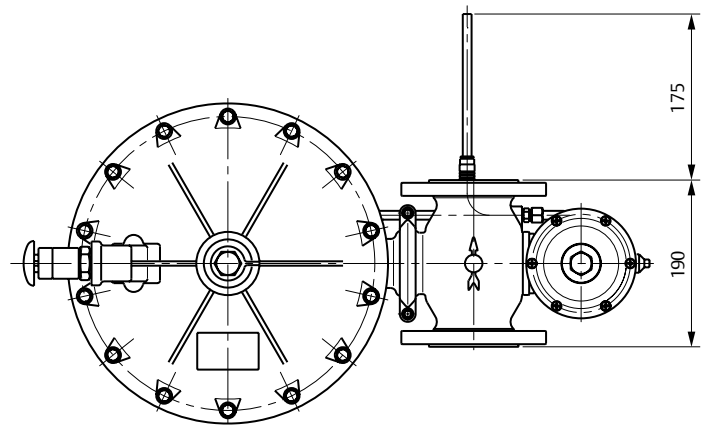
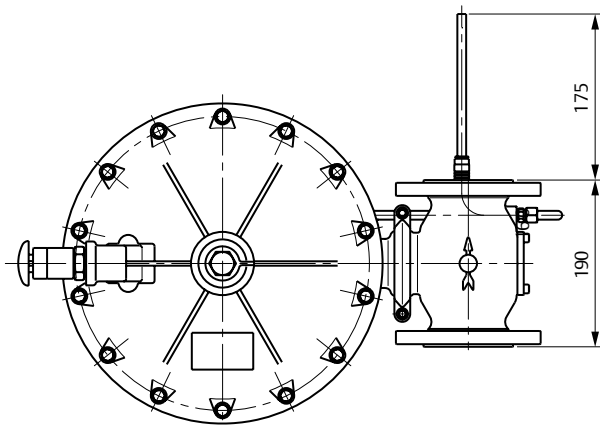
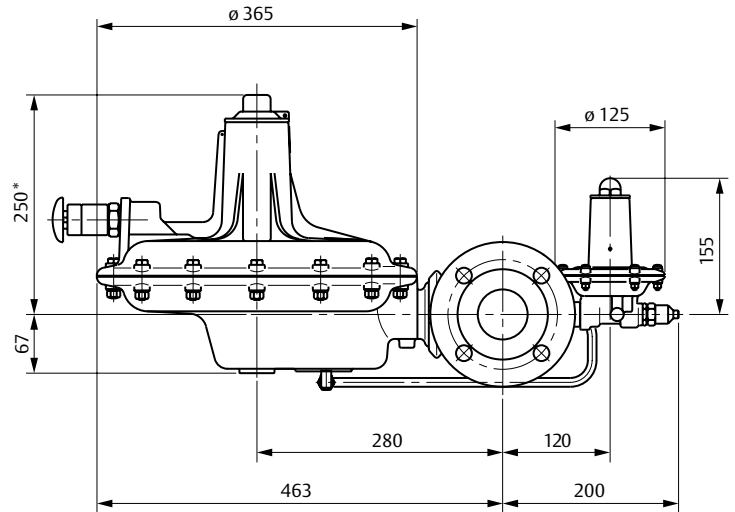
A/140 Regulators

Dimensions (mm) and Weights (kg)

A/142 · A/142-AP



A/149 · A/149-AP



Note: The regulator can be installed with vertical or horizontal orientation of the actuator.

* In high pressure versions (AP), this dimension must be increased by 100 mm.

Weights:

A/142 · A/142-AP: 19 Kg

A/149 · A/149-AP: 20 Kg



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