

LPG MULTIVALVE AT 02

ECE 67R – 01



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LPG multivalves are the core product of the Italian company Tomasetto Achille Spa: they are produced with Tomasetto Achille trade-mark or with the marks of some of the most important kit manufacturers present on the market. With a production capacity of more than 1 million of pieces per year, Tomasetto Achille Spa is the world leader manufacturer of multivalves for lpg tanks.

All Tomasetto multivalves are available in different models, for every type of tank (cylindrical, toroidal or special versions) and in several configurations (on demand, personalized versions are produced as well):

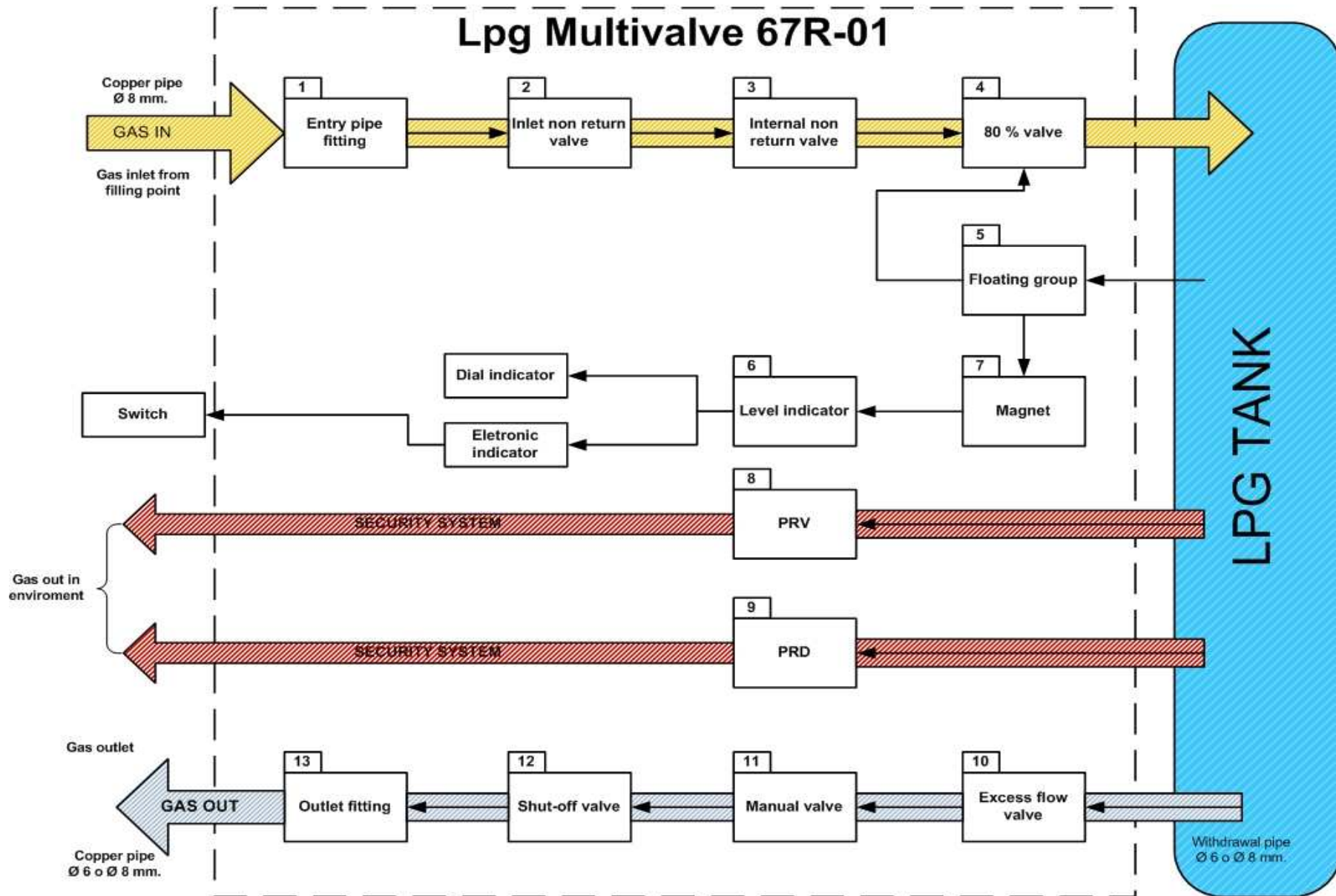
- multivalves model AT02: homologated in accordance with the latest European Regulation 67R-01, they are mainly used in Europe and Asia;
- multivalves model MTE88, homologated in accordance with the European Regulation 67R-00, they are still used mainly in Ukraine, Russia, Ukraina and South America;
- multivalves model AT11: homologated ECE 67R-01, specifically designed for use in 2-wheelers (motorbikes).

Lpg multivalve is a core component for the safety of lpg system. It is installed in the lpg tank, and it has multiple functions, completely integrated in one product: for this reason the product name is “multivalve”.

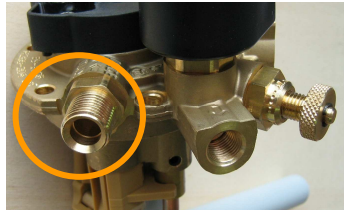
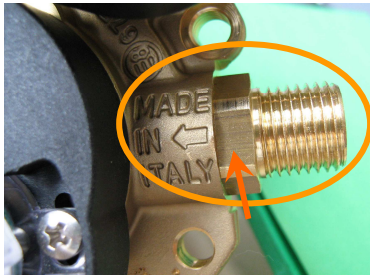
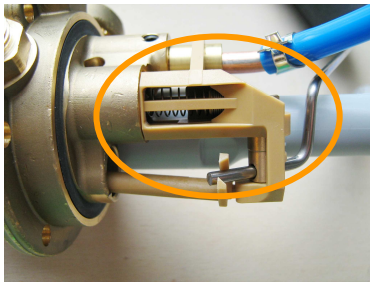


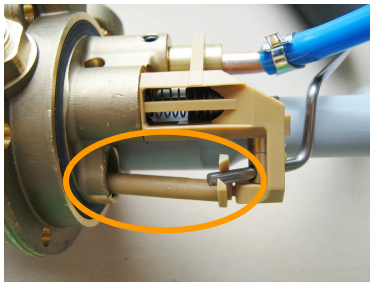
Multivalve’s functions can be divided in different categories:

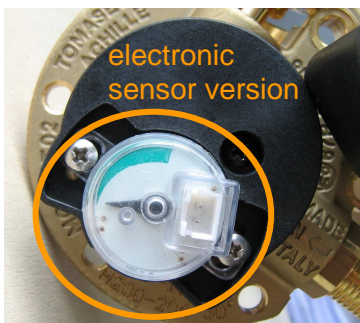
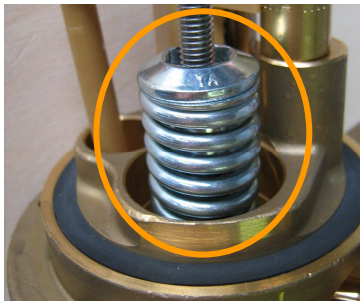
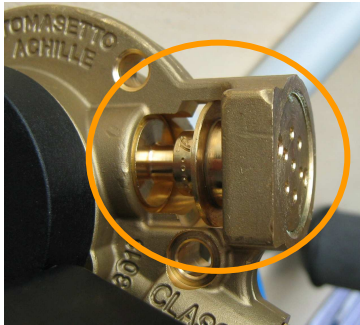
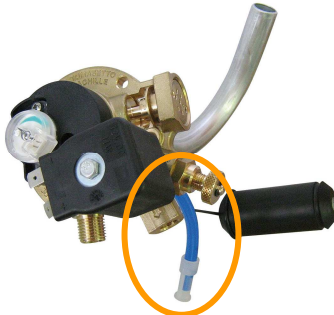
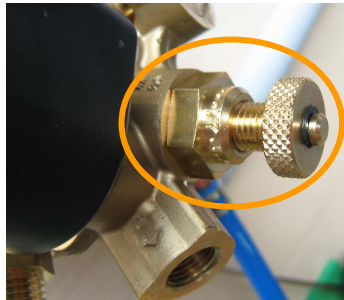
- principal safety functions: the multivalve has a pressure relief valve (safety valve) and a pressure relief device (thermofuse) that in case of overpressure or fire allow the discharge of lpg from the tank, in order to avoid an explosion of the tank
- other safety functions: the multivalve is equipped with an excess flow valve that, in case of accident or breakage of the outlet pipes, stops the excess outgoing flow of lpg; the multivalve is also provided with a shut-off solenoid valve that allows the lpg flow towards the engine only when the engine is running and lpg supply is selected by the driver.
- 80% filling stop: the regulation prescribes that the lpg filling shall stop when the 80% of the volume is reached; this is obtained through a 80% device controlled by a float that is moving inside the tank.
- lpg level indication: the multivalve is provided with an internal magnetic device that gives an indication of lpg level inside the tank through an external mechanical pointer or a electronic sensor connected to lpg switch.
- service functions: the multivalve is provided with a manual service valve that allows to stop the outgoing flow during maintenance of the system.
- functions related to lpg flow: the multivalve has non-return valves in order to prevent the backflow of lpg towards inlet connections.

Following picture is explaining the functional scheme of the multivalve.

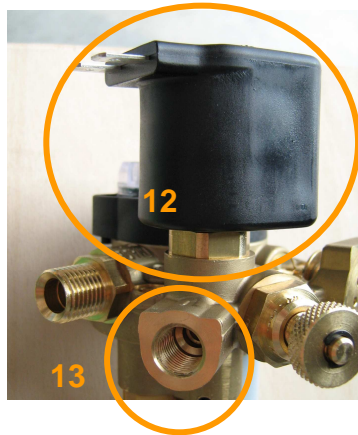


Technical description of components

<p>1 Entry pipe fitting</p>		<p>This fitting is used to connect to the multivalve the copper pipe coming from the filling point</p>
<p>2 Inlet non return valve</p>		<p>Inside the inlet fitting, there is a valve with a retaining spring that after the filling of the tank comes back in closed position, to avoid the backflow of pg to the inlet tube.</p>
<p>3 Internal non return valve</p>		<p>Positioned in series with the previous one, this valve is part of the 80% valve device, and it increases the security of the system against lpg backflow, going into closing position when lpg filling is completed.</p>
<p>4 80 per cent stop valve (80% device)</p>		<p>This valve is put internally to the plastic support, and it is guided by the float group; during the filling, the valve is going against the float rod cam; when the 80% filling level is reached, the float moves through its rod the cam in a position that allows the 80% valve to go in ints closing position, stopping in this way the filling of the tank.</p> <p>After the stop a residual flow of lpg is permitted to guarantee the return of the valve, made by an internal spring.</p>
<p>5 Float group</p>		<p>Special plastic float, is connected by the float rod to the cam of the 80% device.</p> <p>It guides the movement of the magnet holder and allows the indication of the lpg level inside the tank, and controls the opening of 80% device.</p>
<p>6 Magnetic group</p>		<p>The magnetic group is made by a plastic part that holds a magnet; the movement of the float rod, due to different lpg levels inside the tank, create a rotation of the magnet holder that is used to move the external level indicator.</p>

<p>7 Level indicator</p>		<p>The magnetic group guides magnetically the external level indicator that could be a mechanical pointer or an electronic sensor; in case of electronic version, the sensor is connexed by a wire to the switch inside the car, and indicates the quantity of lpg inside the tank.</p>
<p>8 Pressure Relief Valve (safety valve)</p>		<p>The pressure relief valve is a valve with a retaining spring that allows the relief of the lpg in vapour phase from the tank, in case of overpressure (27 bar), to avoid the explosion of the tank. In toroidal multivalves the safety valve is inside a plastic or aluminium pie, that has the function to let release only lpg in vapour phase.</p>
<p>9 Pressure Relief Device (thermofuse)</p>		<p>Device with a thermofuse element that in case of fire melts at predetermined temperature of 120 °C, this allows the opening of a big hole in the valve body, for the fast release of the gas from the tank, in order to avoid the explosion of the tank.</p>
<p>10 Withdrawal pipe - Excess flow valve</p>		<p>The withdrawal pipe is the pipe that allows the withdrawal of lpg from the bottom of the tank. The withdrawal is made because of pressure difference between the tank and outside. The pipe can be plastic or metallic, depending on multivalve version.</p> <p>Inside the pipe fitting to the valve body, there is a valve with a retaining spring that limits the outgoing flow of gas from the multivalve, in case of a breakage of the pipes going to the engine.</p>
<p>11 Manual valve</p>		<p>Device for the manual closing of the gas at the outlet, in case of maintenance of the system.</p> <p>Screwing its external valve, its internal part is moving and closing the passage for lpg, in this way the outlet pipe can be removed without lpg exit.</p>

12 Shut-off solenoid valve



13 Outlet pipe fitting

The solenoid valve is in opening position only when the lpg system is running, otherwise it is closing the outgoing passage to multivalve outlet.

The coil is connected by a wire to the car electric system, when the driver select the lpg use by the electronic switch, the coil receives electrical power and generate an electromagnetic movement of its internal core to the open position.

The shut-off solenoid valve is produced in different versions, according to the dimensions of internal passages (normal, super or extra valves).

Fitting for copper pipe at the outlet of the multivalve, to bring the lpg to the engine