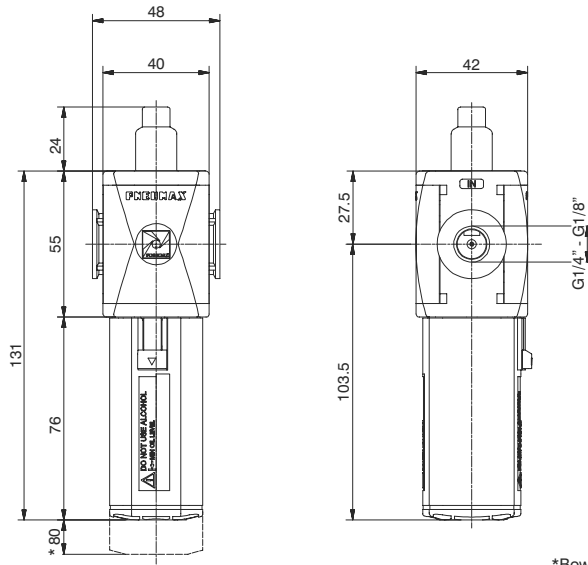


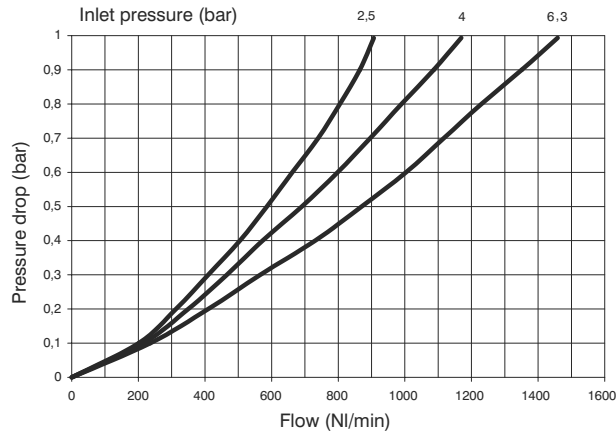
**Lubricator (L)**



\*Bowl removal maximum height

Example : T171BL : size 1, Lubricator with Technopolymer threads, G1/4" connections

Flow rate curves



3

Operational characteristics	Technical characteristics		
- Oil mist lubrication with variable orifice size in function of the flow rate - Oil quantity regulation mechanism and oil quantity visualization dome made of polycarbonate. - Transparent bowl made off polycarbonate with bowl protection guard. - Bowl assembly via bayonet type quick coupling mechanism with safety button.	Connections	G 1/8" - G 1/4"	
	Max. inlet pressure	13 bar	
<b>Note</b> Install as close as possible to the point of use Do not use alcohol, detergent oils or solvents.	Working temperature	-5°C +50°C	
	Weight with Technopolymer threads	gr. 110	
	Weight with threaded inserts	gr. 120	
	Indicative oil drip rate	1 drop every 300/600 NI	
	Oil type	FD22 - HG32	
	Bowl capacity	36 cm <sup>3</sup>	
	Assembly positions	Vertical	
	Max. fitting torque (with Technopolymer threads)	G1/4" = 9 Nm	
	Max. fitting torque (with threaded inserts)	G1/8" = 15 Nm G1/4" = 20 Nm	
	Min. operational flow at 6,3 bar	40 NI/min.	
		<b>Ordering code</b> <b>V171CL</b> VERSION N = Metal inserts T = Technopolymer thread CONNECTIONS A = G1/8" (only for "N" version) B = G1/4" C = G1/4" NPT (only for "N" version)	

## General

The operational safety and durability of a pneumatic circuit depends on the quality of the compressed air. The compressed air and the moisture increase the rate of wear of the surfaces and seals, reducing the efficiency and the life of the pneumatic components. Furthermore the pressure fluctuation due to a discontinuous demand of air, adversely effect the correct operation of the circuit. To eliminate these disadvantages it is essential to install the service unit: filter, pressure regulator and lubricator.

## Construction and working characteristics

The new FRL units AIRPLUS series represents the evolution of the well known and consolidated 1700 series.

The main features are increased performances, reliability, easy and fast assembly and the introduction of the latest technical features.

With the exception of the air intake module and the pressure switch module all elements are available in two configurations: with technopolymer connections (IN and OUT), (T series), or with metal threaded inserts, (N series).

Bowls made of transparent polycarbonate (PC) are fitted with a bowl protection guard which is assembled on the body via a quick coupling mechanism provided with a safety button. The filter, available with three filtration grades (5 $\mu$ m, 20 $\mu$ m and 50 $\mu$ m) is fitted as standard with a drain mechanism which can be operated manually or semi-automatically. The regulator is based on the rolling diaphragm technology with low hysteresis and the system is balanced. The unit can be fitted with integrated flush mounting pressure gauge (0 to 12 bar range).

4 pressure ranges are available going from 0 to 12 bar and the regulating knob can be blocked in position simply by pressing it down. A dedicated version is available for battery mounting, up to a maximum of 6 units. The lubricator is based on the Venturi principle and the oil quantity is regulated via the adjusting screw positioned on the transparent polycarbonate (PC) regulating dome which also ensure clear visibility of the oil flow and regulation. The oil suction pipe is fitted as standard with a sintered filter which ensures that any contaminant that should be present in the oil will reach the down stream circuit. Shoot off valve is available in two versions, one manually operated and one solenoid operated. In both cases the unit is fitted with a threaded connection for depressurising the downstream circuit. On the manually operated version, in the lock position, it is possible to fit up to three locks in order to prevent the accidental pressurization of the pneumatic circuit avoiding accidents or damages.

The solenoid operated version is available with a 15mm or with a 22mm solenoid valve. The soft start valve ensure a progressive pressurization of the down stream circuit avoiding sudden pressure surges which could be dangerous for the devices fitted on the down stream circuit. The filling time can be easily adjusted via a built in flow regulator. The full flow rate is allowed only once the down stream pressure has reached 50% of the value of the inlet pressure. The pressure switch module which can be set between 2 and 10 bar and the air intake module complete the range. The elements are joint together via dedicated quick coupling technopolymer flanges which allows for the units to be panel mounted moreover ensure the possibility to replace any component without disassembling the FRL group from its position.

90° mounting brackets and standard gauges are also available.

## Instruction for installation and operation

The FRL unit must be installed as close as possible to the application.

The air flow direction must follow the directions indicated on the single units in correspondence of the threaded connections. (IN and OUT)

Units provided with bowl must be mounted vertically with the bowl facing down. Single units or groups can be panel mounted via the Y type flanges, regulators and filter-regulators can be mounted via the 90° zinc plated steel bracket. In order to mount the 90° bracket it is necessary to remove the regulating knob and then the locking ring before positioning the bracket. All units must be operated according to the specified pressure and temperature ranges; fittings must be mounted without exceeding the maximum torque allowed. Ensure that the units cover plates are in position before pressure is applied. The cover plates are needed to lock in position the top part of the unit. The condense level in filter and filter-regulators bowls must never exceed the maximum level indicated on the bowls. With manual or semi automatic drain the condense can be discharged via a 6/4mm tube directly connected to the drain tap. On the pressure regulator the pressure value must always set while pressure is rising and ideally the unit pressure range should be chosen based on the pressure value to be regulated. Lubricators must be filled with class FD22 and HG32 oils. Ensure, both on the inlet and on the outlet, that the flow rate is above the minimum flow rate required to operate the unit. Below this value the units does not operate.

The oil quantity can be regulated via the regulating screw on the transparent polycarbonate dome through which it is also clearly visible the oil flow. A drop every 300-600 litres should be allowed. The oil refill can take place only with the bowl not under pressure. This size does not have the dedicated oil re-fill plug.

The manual shot off valve needs, to be operated, a push and turn action (clockwise) in order to close it and discharge the down stream circuit it is necessary to turn anti clock wise the knob. The soft start valve is used to slowly and progressively pressurize the down stream circuit, the time needed to do so can be set by means of the built in flow regulator. The soft start valve on its own does not allow for the down stream circuit to be discharged, in order to do so it is necessary to combine it with a shot off valve (to be mounted upstream).

## Maintenance



**For any maintenance which requires the removal of the top plugs/ supports from the body it is necessary to preventively remove the sides cover plates. If the top plugs/supports are removed with the sides plates still in their position the unit could be permanently damaged.**

Bowls, plugs and supports are assembled with a bayonet type mechanism. In order to remove them rotate anti clockwise until the mechanical stop is reached and than remove from the body (for the bowls firstly press down the green safety button).

Bowls and transparent parts can be cleaned with water and neutral soap. Do not use solvents or alcohol.

Filtering elements (from filters and filter regulators) made of HDPE can be regenerated by washing and blowing them. In order to remove them it is necessary to remove the bowl unscrew the filter element and replace it with a new one or clean it.

The oil refill process can take place only if the bowl is not pressurized. The oil refill plug is not available on this size.

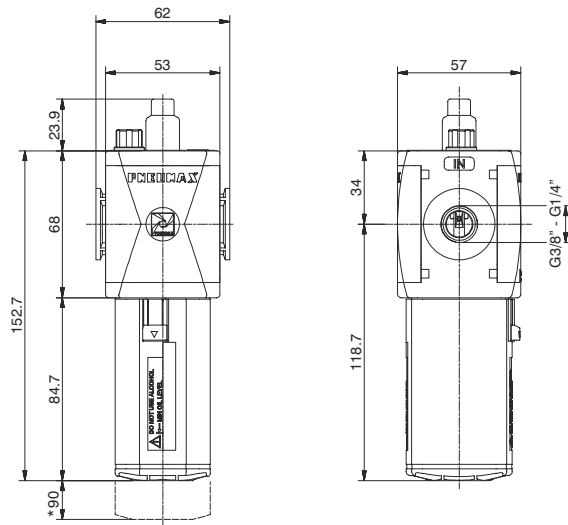
Should the pressure regulator not perform properly or should present a constant leakage from the relieving replaced the diaphragm by unloading completely the regulating spring before removing the regulation support.

Any other maintenance operation, in consideration of the complexity of the assembly, and the need of a through test according to the Pneumax spa specification, should be carried out by the manufacturer.

## Fittings maximum recommended torque applicable

THREAD	Technopolymer version (T)	Metal version (N)
G1/8"	4 Nm	15 Nm
G1/4"	9 Nm	20 Nm
G3/8"	16 Nm	25 Nm
G1/2"	22 Nm	30 Nm

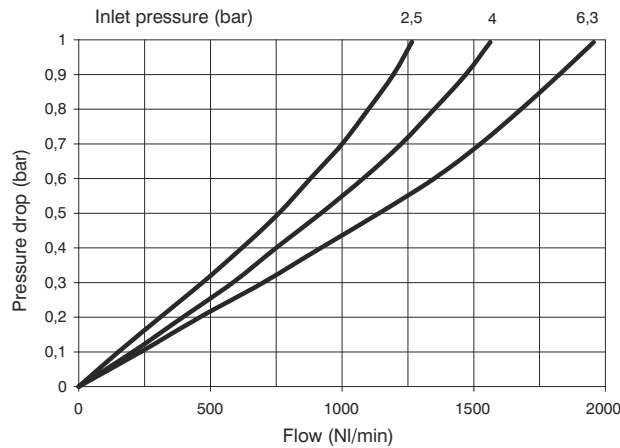
**Lubricator (L)**



\*Bowl removal maximum height

Example : T172BL : size 2, Lubricator with Technopolymer threads, G3/8" connections

Flow rate curves



3

Operational characteristics	Technical characteristics		Ordering code
<ul style="list-style-type: none"> <li>- Oil mist lubrication with variable orifice size in function of the flow rate</li> <li>- Oil quantity regulation mechanism and oil quantity visualization dome made of polycarbonate.</li> <li>- Transparent bowl made off polycarbonate with bowl protection guard.</li> <li>- Bowl assembly via bayonet type quick coupling mechanism with safety button.</li> <li>- Oil filling plug</li> <li>- Oil can be refilled with pressurized circuit.</li> <li>- Available with electric min-level sensor N.O. or N.C. with connection for connector.</li> <li>- For electrical connection use connectors type C1-C2-C3 (see sensors chapter in the catalogue).</li> </ul>	Connections	G 1/4" - G 3/8"	<b>V172L</b>
	Max. inlet pressure	13 bar	
	Working temperature	-5°C +50°C	<b>C</b> CONNECTIONS A = G1/4" (only for "N" version) B = G3/8" C = G3/8" NPT (only for "N" version)
	Weight with Technopolymer threads	gr. 210	
	Weight with threaded inserts	gr. 220	
	Indicative oil drip rate	1 drop every 300/600 NI	
	Oil type	FD22 - HG32	
	Bowl capacity	70 cm <sup>3</sup>	
	Assembly positions	Vertical	
	Max. fitting torque (with Technopolymer threads)	G3/8" = 16 Nm	
Max. fitting torque (with threaded inserts)	G1/4" = 20 Nm G3/8" = 25 Nm		
<b>Note</b>	Min. operational flow at 6,3 bar	70 NI/min.	
Install as close as possible to the point o fuse Do not use alcohol, deterging oils or solvents.			

## Construction and working characteristics

The new FRL units AIRPLUS series represents the evolution of the well known and consolidated 1700 series.

The main features are increased performances, reliability, easy and fast assembly and the introduction of the latest technical features.

With the exception of the air intake module and the pressure switch module all elements are available in two configurations: with technopolymer connections (IN and OUT), (T series), or with metal threaded inserts, (N series). Bowls made of transparent polycarbonate (PC) are fitted with a bowl protection guard which is assembled on the body via a quick coupling mechanism provided with a safety button. The filter, available with three filtration grades (5 $\mu$ m, 20 $\mu$ m and 50 $\mu$ m) is fitted as standard with a drain mechanism which can be operated manually or semi-automatically. On request is available the auto-drain mechanism. The regulator is based on the rolling diaphragm technology with low hysteresis and the system is balanced. The unit can be fitted with integrated flush mounting pressure gauge (0 to 12 bar range). 4 pressure ranges are available going from 0 to 12 bar and the regulating knob can be blocked in position simply by pressing it down. A dedicated version is available for battery mounting, up to a maximum of 6 units. The lubricator is based on the Venturi principle and the oil quantity is regulated via the adjusting screw positioned on the transparent polycarbonate (PC) regulating dome which also ensure clear visibility of the oil flow and regulation. The oil suction pipe is fitted as standard with a sintered filter which ensures that any contaminant that should be present in the oil will reach the down stream circuit. Shoot off valve is available in two versions, one manually operated and one solenoid operated. In both cases the unit is fitted with a threaded connection for depressurising the downstream circuit. On the manually operated version, in the lock position, it is possible to fit up to three locks in order to prevent the accidental pressurization of the pneumatic circuit avoiding accidents or damages. The solenoid operated version is available with a 15mm or with a 22mm solenoid valve. The soft start valve ensure a progressive pressurization of the down stream circuit avoiding sudden pressure surges which could be dangerous for the devices fitted on the down stream circuit. The filling time can be easily adjusted via a built in flow regulator. The full flow rate is allowed only once the down stream pressure has reached 50% of the value of the inlet pressure. The pressure switch module which can be set between 2 and 10 bar and the air intake module complete the range.

The elements are joint together via dedicated quick coupling technopolymer flanges which allows for the units to be panel mounted moreover ensure the possibility to replace any component without disassembling the FRL group from its position. 90° mounting brackets and standard gauges are also available.

## Instruction for installation and operation

The FRL unit must be installed as close as possible to the application. The air flow direction must follow the directions indicated on the single units in correspondence of the threaded connections. (IN and OUT)

Units provided with bowl must be mounted vertically with the bowl facing down. Single units or groups can be panel mounted via the Y type flanges, regulators and filter-regulators can be mounted via the 90° zinc plated steel bracket. In order to mount the 90° bracket it is necessary to remove the regulating knob and then the locking ring before positioning the bracket. All units must be operated according to the specified pressure and temperature ranges; fittings must be mounted without exceeding the maximum torque allowed. Ensure that the units cover plates are in position before pressure is applied. The cover plates are needed to lock in position the top part of the unit.

The condense level in filter and filter-regulators bowls must never exceed the maximum level indicated on the bowls. With manual or semi automatic drain the condense can be discharged via a 6/4mm tube directly connected to the drain tap. On the pressure regulator the pressure value must always set while pressure is rising and ideally the unit pressure range should be chosen based on the pressure value to be regulated. Lubricators must be filled with class FD22 and HG32 oils. Ensure, both on the inlet and on the outlet, that the flow rate is above the minimum flow rate required to operate the unit. Below this value the units does not operate. The oil quantity can be regulated via the regulating screw on the transparent polycarbonate dome through which it is also clearly visible the oil flow. A drop every 300-600 litres should be allowed.

The oil can be re-filled while the pneumatic circuit is pressurized thanks to the exhaust valve which is built in the refill plug and allows for the bowl to be depressurized and the oil refill directly form in the bowl or from the plug. The manual shot off valve needs, to be operated, a push and turn action (clockwise) in order to close it and discharge the down stream circuit it is necessary to turn anti clock wise the knob. The soft start valve is used to slowly and progressively pressurize the down stream circuit, the time needed to do so can be set by means of the built in flow regulator. The soft start valve on its own does not allow for the down stream circuit to be discharged, in order to do so it is necessary to combine it with a shot off valve (to be mounted upstream).

## Maintenance



**For any maintenance which requires the removal of the top plugs/ supports from the body it is necessary to preventively remove the sides cover plates. If the top plugs\supports are removed with the sides plates still in their position the unit could be permanently damaged.**

Bowls, plugs and supports are assembled with a bayonet type mechanism. In order to remove them rotate anti clockwise until the mechanical stop is reached and than remove from the body (for the bowls firstly press down the green safety button). Bowls and transparent parts can be cleaned with water and neutral soap. Do not use solvents or alcohol.

Filtering elements (from filters and filter regulators) made of HDPE can be regenerated by washing and blowing them. In order to remove them it is necessary to remove the bowl unscrew the filter element and replace it with a new one or clean it. The oil can be re-filled while the pneumatic circuit is pressurized thanks to the exhaust valve which is built in the refill plug and allows for the bowl to be depressurized. In order to be able to unmount the bowl it is necessary unscrew the refill plug positioned near the oil dome, once this operation has been carried out it is possible to remove the bowl to re fill it or to refill from the refill plug. Refilling directly the bowl is suggested.

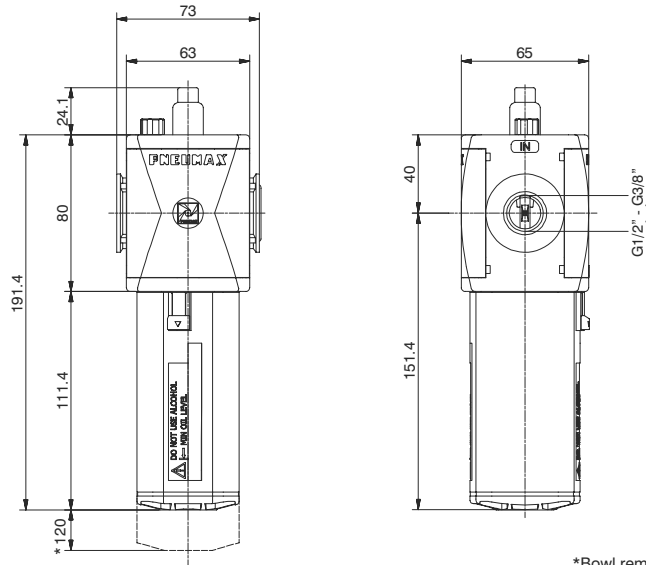
Should the pressure regulator not perform properly or should present a constant leakage from the relieving replaced the diaphragm by unloading completely the regulating spring before removing the regulation support. Any other maintenance operation, in consideration of the complexity of the assembly, and the need of a through test according to the Pneumax spa specification, should be carried out by the manufacturer.

## Fittings maximum recommended torque applicable

THREAD	Technopolymer version (T)	Metal version (N)
G1/8"	4 Nm	15 Nm
G1/4"	9 Nm	20 Nm
G3/8"	16 Nm	25 Nm
G1/2"	22 Nm	30 Nm



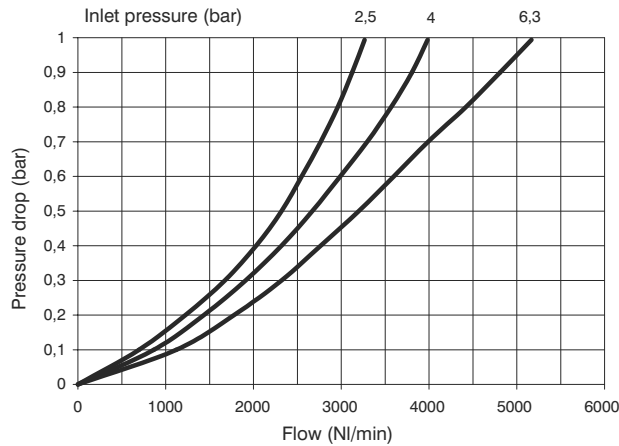
Lubricator (L)



\*Bowl removal maximum height

Example : T173BL : size 3, Lubricator with Technopolymer threads, G1/2" connections

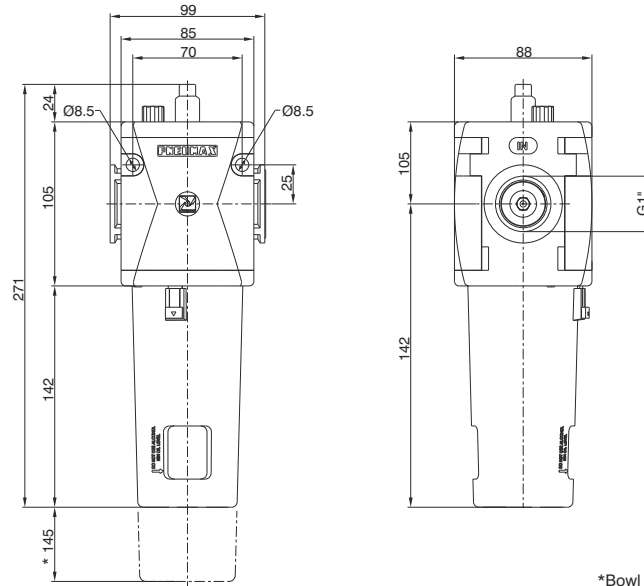
Flow rate curves



3

Operational characteristics	Technical characteristics		Ordering code	
<ul style="list-style-type: none"> <li>- Oil mist lubrication with variable orifice size in function of the flow rate</li> <li>- Oil quantity regulation mechanism and oil quantity visualization dome made of polycarbonate.</li> <li>- Transparent bowl made off polycarbonate with bowl protection guard.</li> <li>- Bowl assembly via bayonet type quick coupling mechanism with safety button.</li> <li>- Oil filling plug</li> <li>- Oil can be refilled with pressurized circuit.</li> <li>- Available with electric min-level sensor N.O. or N.C. with connection for connector.</li> <li>- For electrical connection use connectors type C1-C2-C3 (see sensors chapter in the catalogue).</li> </ul>	Connections	G 3/8" - G 1/2"	<b>V173L</b>	
	Max. inlet pressure	13 bar		VERSION N = Metal inserts T = Technopolymer thread
	Working temperature	-5°C +50°C	Weight with Technopolymer threads gr. 290 Weight with threaded inserts gr. 310	<b>C</b> CONNECTIONS A = G3/8" (only for "N" version) B = G1/2"
	Indicative oil drip rate	1 drop every 300/600 NI		C = G1/2" NPT (only for "N" version)
	Oil type	FD22 - HG32	Bowl capacity 136 cm <sup>3</sup> Assembly positions Vertical	OPTIONS A = Min. Oil level indicator Normally open C = Min. Oil level indicator Normally closed
	Max. fitting torque (with Technopolymer threads)	G1/2" = 22 Nm		Max. fitting torque (with threaded inserts) G3/8" = 25 Nm G1/2" = 30 Nm
	Max. fitting torque (with threaded inserts)	G1/2" = 30 Nm	Min. operational flow at 6,3 bar 100 NI/min.	
	<b>Note</b>	Install as close as possible to the point o fuse Do not use alcohol, deterging oils or solvents.		

Lubricator (L)

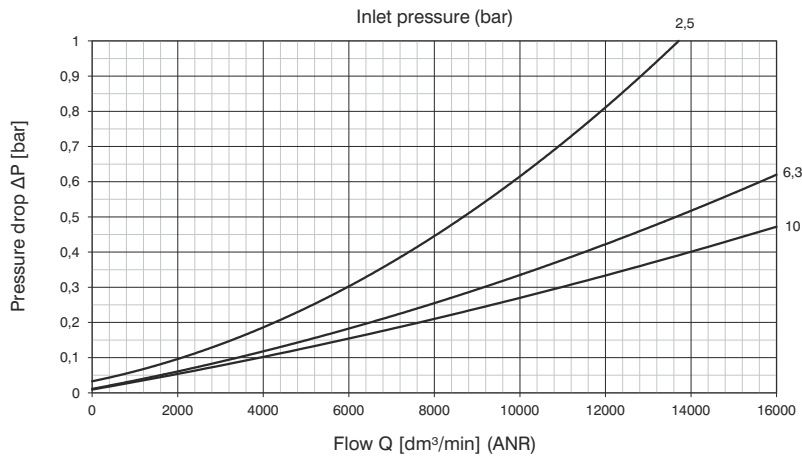


\*Bowl removal maximum height

Example : N174BL : size 4, Lubricator, G1" connections

3

Flow rate curves



Operational characteristics

- Oil mist lubrication with variable orifice size in function of the flow rate
- Oil quantity regulation mechanism and oil quantity visualization dome made of polycarbonate.
- Transparent bowl made off polycarbonate with bowl protection guard.
- Bowl assembly via bayonet type quick coupling mechanism with safety button.
- Oil filling plug
- Oil can be refilled with pressurized circuit.
- Available with electric min-level sensor N.O. or N.C. with connection for connector.
- For electrical connection use connectors type C1-C2-C3 (see sensors chapter in the catalogue).

Note

Install as close as possible to the point o fuse  
Do not use alcohol, deterging oils or solvents.

Technical characteristics

Connections	G1"	Ordering code
Max. inlet pressure	13 bar	
Working temperature	-5°C +50°C	<b>N174BL</b>
Weight	1025 (gr)	
Indicative oil drip rate	1 goccia ogni 300/600 NI	OPTIONS
Oil type	FD22 - HG32	<input type="radio"/> A = Min. Oil level indicator Normally open
Bowl capacity	360 cm <sup>3</sup>	<input checked="" type="radio"/> C = Min. Oil level indicator Normally closed
Assembly positions	Vertical	
Min. operational flow at 6,3 bar	100 dm <sup>3</sup> /min. (ANR)	
Wall fixing screw	M8	