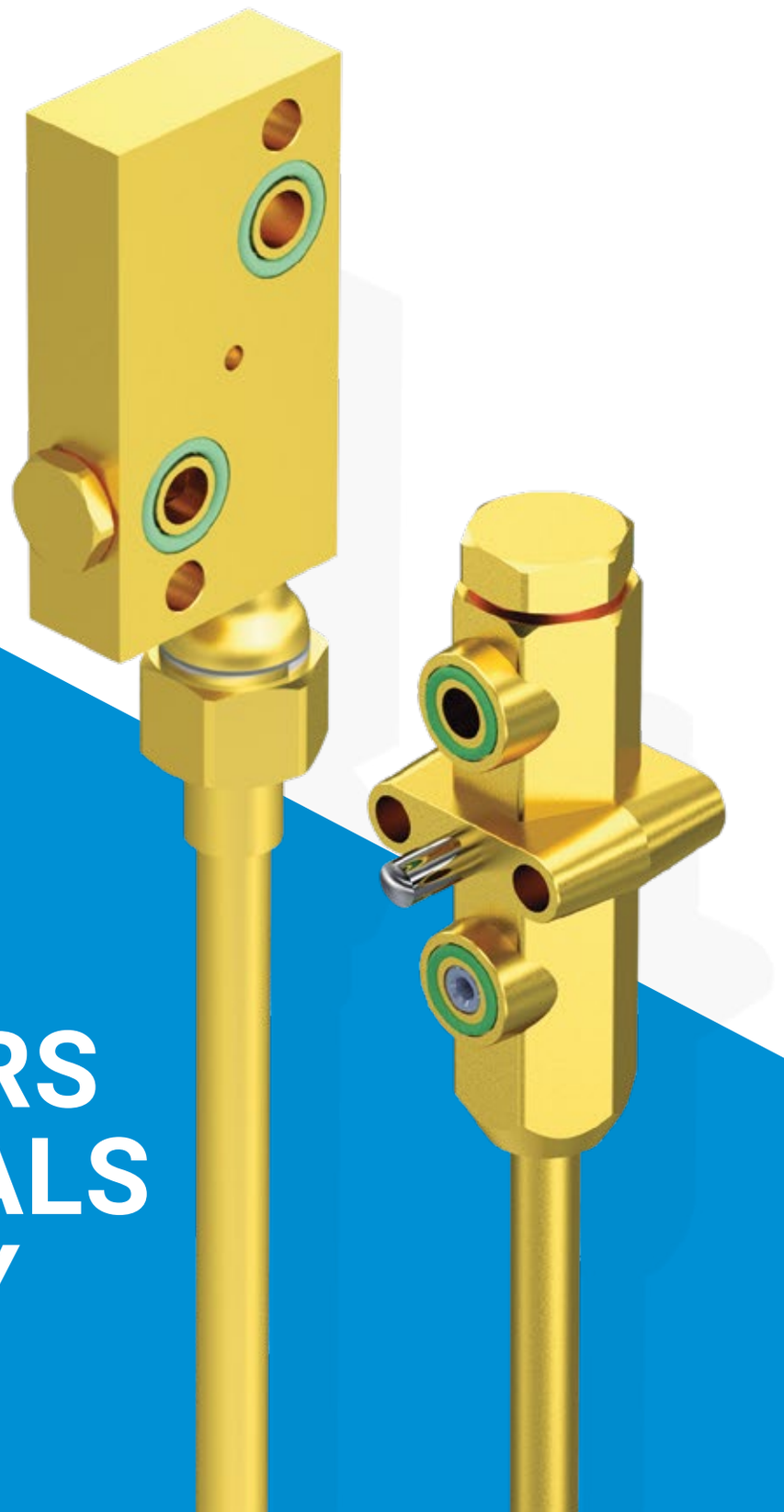
PNR

SPRAY NOZZLES FOR INDUSTRIAL APPLICATIONS



ATOMIZERS FOR METALS INDUSTRY

PNR ITALIA SRL

EXPERIENCE, EXPERTISE AND QUALITY FOR THE INDUSTRY

In 2018, PNR Italia celebrated its first 50 years of activity. Through the constant investment of its profits in technical and organizational improvements, PNR is now able to offer excellent products and services. A fully equipped lab, state-of-the-art machines, manufacturing capacities and exclusive design patents, make PNR the perfect partner for the most demanding customers who require quality products for their high-level production plants and processes.

With great confidence in our skills and expertise, based on a long history of success on the European market, our new team of design engineers and technical staff is now going to face a new challenging era of growth and development.

The property was extended with the purchase of more land that brought the total covered surface of the site to 6.000 m2.

PNR Italia started as a trader of components for the fire-extinguishing systems but, in the following years, started to design and produce nozzles for the fire-fighting sector first and then extended its activities by manufacturing a wide range of spraying nozzles and systems for applications in almost all types of industry.

Our portfolio ranges from all types of spray nozzles, wash heads and atomizers to more complex and tailored spraying units and devices. The result of a long experience and a vast know-how in fluids dynamics, design, and manufacturing.

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PNR headquarter - Voghera (Italy)

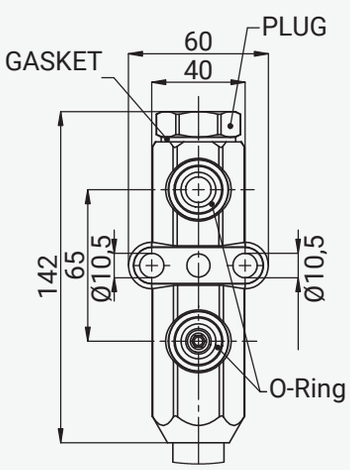
MB SERIES
FLAT FAN LANCE ATOMIZER

CONNECTION TYPE
Plug-in

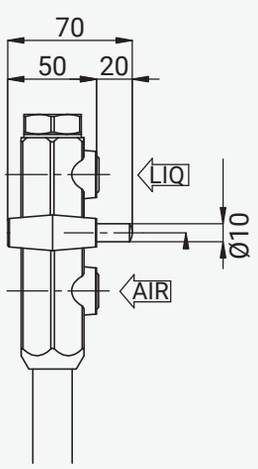
PRIMARY SPRAY ANGLE
From 30° to 130°

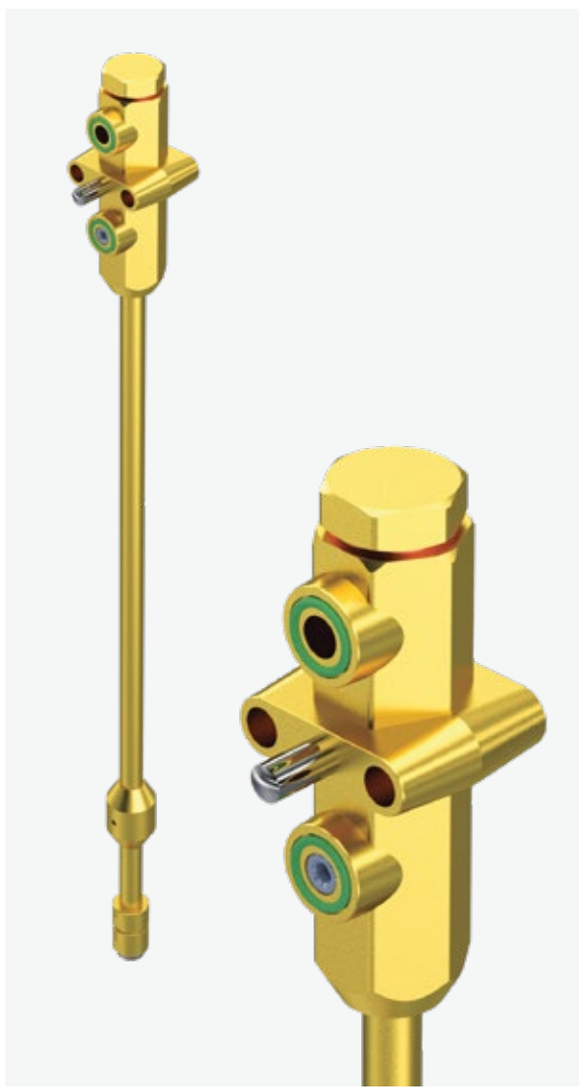
MATERIALS
Body: Brass
Tube: Brass
Tip: Brass, Ni-plated brass, AISI 316L s.s.

FRONT VIEW



LATERAL VIEW





DIMENSIONS	MIN	MAX	
Body width	60,0		mm
Body lenght	142		mm
Body tickness	49,5		mm
Distance between reference pin and spray pin	customized		mm
Tube bent angle	0°	35°	deg
Tube outside diameter	10,0	40,0	mm
Horizontal distance between plugs	65,0		mm
Primary spray angle	30°	130°	deg
Secondary spray angle	5°	30°	deg

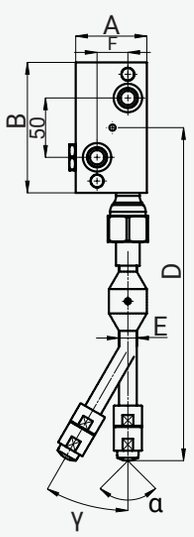
MT SERIES
FLAT FAN LANCE ATOMIZER

CONNECTION TYPE
Plug-in

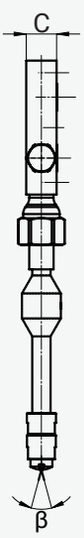
PRIMARY SPRAY ANGLE
From 30° to 130°

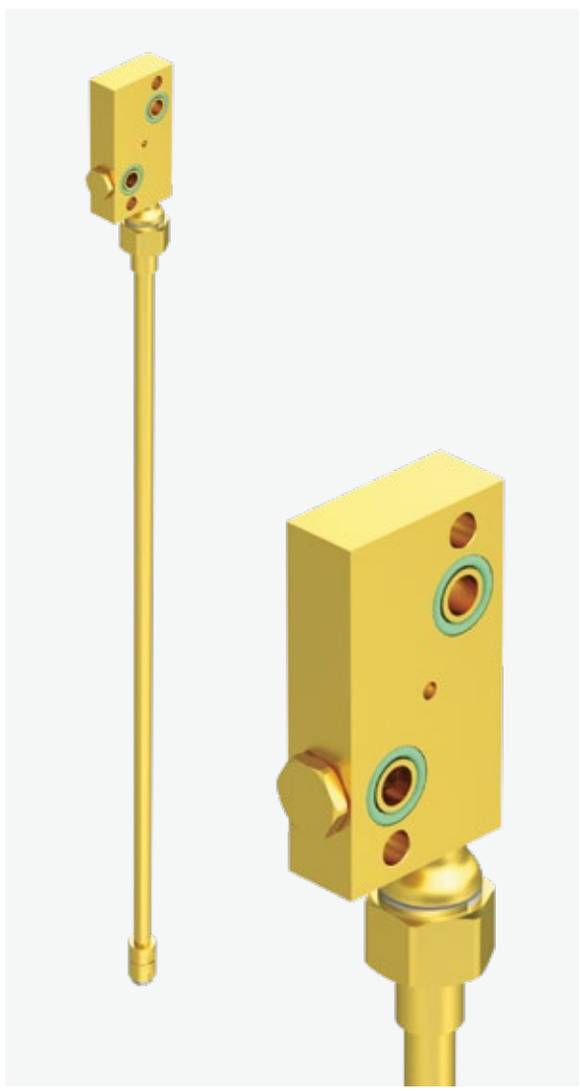
MATERIALS
Body: Brass, AISI 316L s.s.
Tube: Brass, AISI 316L s.s.
Tip: Brass, Ni-plated brass, AISI 316L s.s.

FRONT VIEW



LATERAL VIEW





DIMENSIONS	REFERENCE		MIN	MAX
Body width	A	mm	50,0	80,0
Body lenght	B	mm	80,0	150,0
Body tickness	C	mm	25,0	35,0
Distance between reference pin and spray pin	D	mm	customized	
Tube bent angle	γ	deg	0°	35°
Tube outside diameter	E	mm	10,0	40,0
Horizontal distance between plugs	F	mm	26,0	46,0
Primary spray angle	α	deg	30°	130°
Secondary spray angle	β	deg	5°	30°

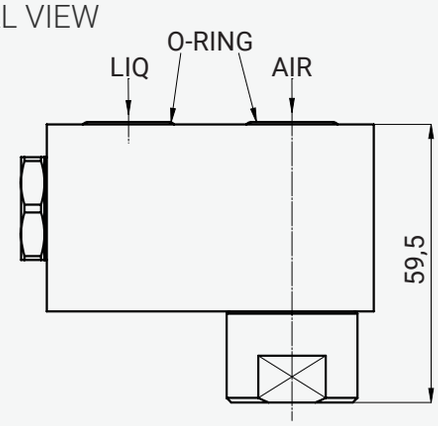
MN SERIES
FULL CONE ATOMIZER

The MN series atomizers are normally used to cool blooms and billets. They have a full cone spray pattern and a mounting system to the support plates through two pins and O-rings in Viton. They can be supplied with 1/4" or 3/8" female liquid/air connections upon request. All MN atomizers are supplied with a capacity/pressure chart so to be able to adjust the pumps to the capacities required by the plant.

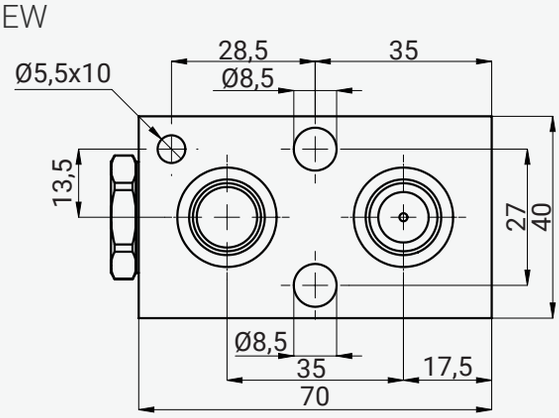
CONNECTION TYPE
Plug in
BSP threaded (1/4" - 3/8")
NPT threaded (1/4" - 3/8")

MATERIALS
AISI 303 s.s.
AISI 316L s.s.
Brass

LATERAL VIEW



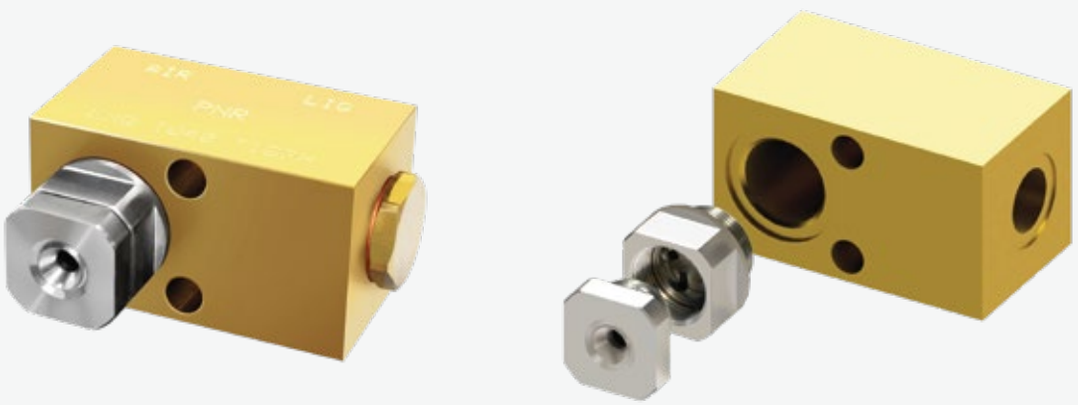
TOP VIEW



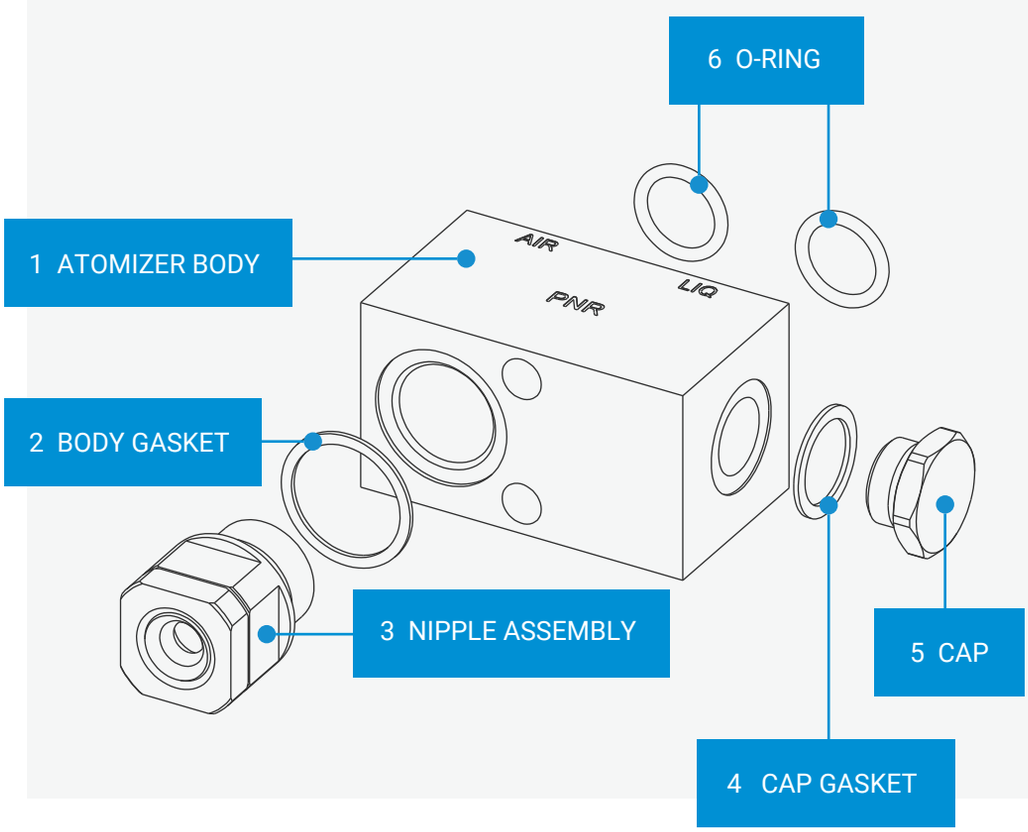
CODE	WATER FLOW RATE (lpm) AT DIFFERENTE PRESSURE VALUES (bar)		MAX AIR FLOW RATE (Nm³/h) AT PRESSURE (bar)	SPRAY ANGLE
MNQ 1069 T1SH	0,5 @ P = 1,5 bar	2,8 @ P = 6,5 bar	3,8 @ P = 1,5 bar	60°
MNQ 1021 T1SH	0,4 @ P = 0,5 bar	4,0 @ P = 7,0 bar	4,0 @ P = 0,5 bar	
MNQ 1040 T1SH	0,8 @ P = 1,0 bar	8,0 @ P = 7,0 bar	8,5 @ P = 1,0 bar	
	Air pressure = 2 bar		*Air pressure = 2 bar*	

MN SERIES
DETACHABLE ATOMIZER

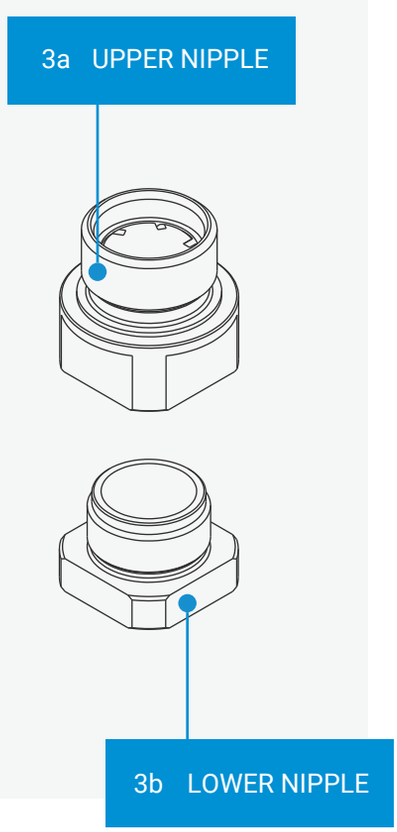
We have implemented an improved version of MN series atomizers which has a main feature: some components can be disassembled for cleaning. As you can see in the exploded view, the nipple assembly can be taken apart from the atomizer body, and then further disassembled. The nipple assembly is the part of the atomizer more subject to clogging: in this way, with few easy steps and only blowing compressed air in all free passages, you have the possibility to clean your atomizers and to start working again without any problems!



EXPLODED VIEW OF COMPLETE ATOMIZER



EXPLODED VIEW OF NIPPLE



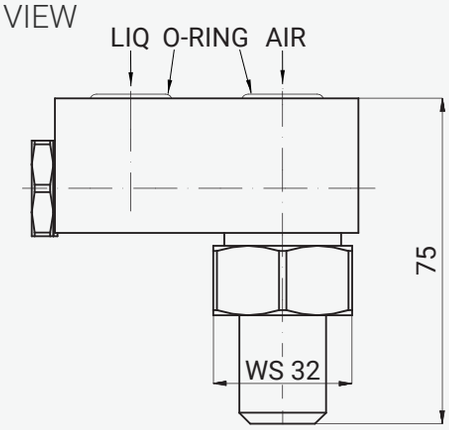
MO SERIES
OVAL JET ATOMIZER

The MO atomizers with oval spray coverage are normally used to cool blooms and billets. They have a fastening system to lock them on the supporting plates through two pins and O-ring in Viton. On request they can be supplied with 1/4" or 3/8" female liquid/air connections upon request. All MO atomizers are supplied with a capacity/pressure chart in order to adjust the pumps to the capacities required for the plant.

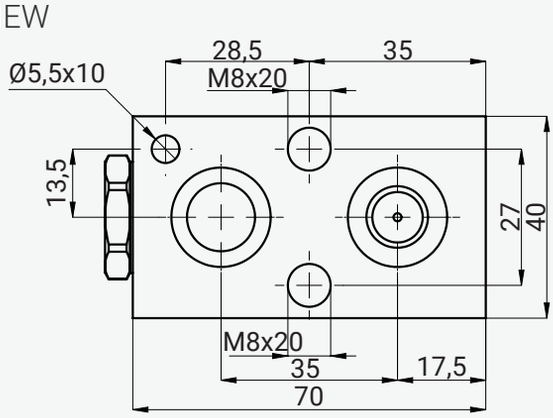
CONNECTION TYPE
Plug in
BSP threaded (1/4" - 3/8")
NPT threaded (1/4" - 3/8")

MATERIALS
AISI 303 s.s.
AISI 316L s.s.
Brass

LATERAL VIEW



TOP VIEW



CODE	WATER FLOW RATE (lpm) AT DIFFERENTE PRESSURE VALUES (bar)		MAX AIR FLOW RATE (Nm³/h) AT PRESSURE (bar)	SPRAY ANGLE	
				α	β
MOU F101 T1SH	0,4 @ P = 1,0 bar	3,0 @ P = 6,0 bar	3,0 @ P = 1,0 bar	90°	30°
MOU F109 T1SH	0,5 @ P = 0,5 bar	7,0 @ P = 7,0 bar	4,6 @ P = 0,5 bar		
MOU F113 T1SH	0,6 @ P = 0,5 bar	6,7 @ P = 7,0 bar	6,4 @ P = 0,5 bar		
MOQ F113 T1SH	0,6 @ P = 0,5 bar	6,7 @ P = 7,0 bar	6,4 @ P = 0,5 bar	60°	60°
	Air pressure = 2 bar		*Air pressure = 2 bar*		

FLAT FAN LANCE ATOMIZERS

In continuous casting, and in slab casting in particular, lance atomizers replace conventional compact atomizers, currently called block atomizers, where the atomizer body is equipped with an extension and the spray tip is located at the exit end of the extension. The reasons of this replacement are due either to the geometrical need to insert the spraying pipe between rolls, whose clearance is often very small and prevents the use of block atomizers, or to the convenience to position the feeding pipes far from the intensely heated area near the slabs.

Lance atomizers can be classified according to different parameters:
Atomizer's body: the body where atomization is generated is matched by a plug-in connection to fluid feeding ducts, may have different shapes according to the model and may be casted or machined.
Geometry of the pipe: straight pipe, or bent type.
Connections of the pipe to the body: the extension pipe is welded onto the block body, or the extension pipe is screwed to the block body with a locknut.

MB TYPE

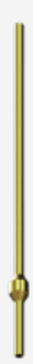
Casted body, with welded extension pipe

Casted body, with screwed extension pipe

MT TYPE

Machined body, with welded extension pipe

Machined body, with screwed extension pipe



Straight extension pipe

Bent extension pipe (angles can be customized)

MB / MT PERFORMANCES

In the following table you can check the performance of the lances we have already produced. We have indicated the minimum and maximum value of water flow rate (in liters per minute) and the maximum value of air flow rate (in Nm^3 per hour), at different values of water pressure (Pw) and air pressure (Pa). The red X must be substituted with B or T, depending on the body you choose, while the blue Y represents the spray angle (between 30° and 130°). The final x depend on the materials.

CODE	WATER FLOW RATE (lpm) MIN	MAX	MAX AIR FLOW RATE (Nm^3/h)
MXY BA08A xxxx	0,30	3,00	3,00
MXY BA10A xxxx	0,40	4,00	4,00
MXY D0D3A xxxx	0,40	4,50	9,00
MXY BA12A xxxx	0,50	5,00	5,00
MXY BA15A xxxx	0,60	6,00	6,00
MXY BA21A xxxx	0,80	8,00	8,00
MXY D010A xxxx	1,55	10,0	13,4
MXY BA28A xxxx	1,10	11,0	11,0
MXY BA32A xxxx	3,00	13,0	14,8
MXY D014A xxxx	2,00	13,7	14,8
MXY B016A xxxx	2,00	16,0	16,0
MXY BA42A xxxx	1,70	17,0	17,0
MXY BA50A xxxx	2,00	20,0	20,0
MXY D021A xxxx	3,80	21,4	18,1
MXY A023B xxxx	3,00	23,0	23,0
MXY B028A xxxx	5,50	34,3	34,5
MXY BAA1A xxxx	6,80	41,7	42,0
	Pw = 1 bar	*Pw = 7 bar*	*Pw = 1 bar*
	Pa = 2 bar		

For all models, it's also available the ECO version, with reduced air consumption. For instance:

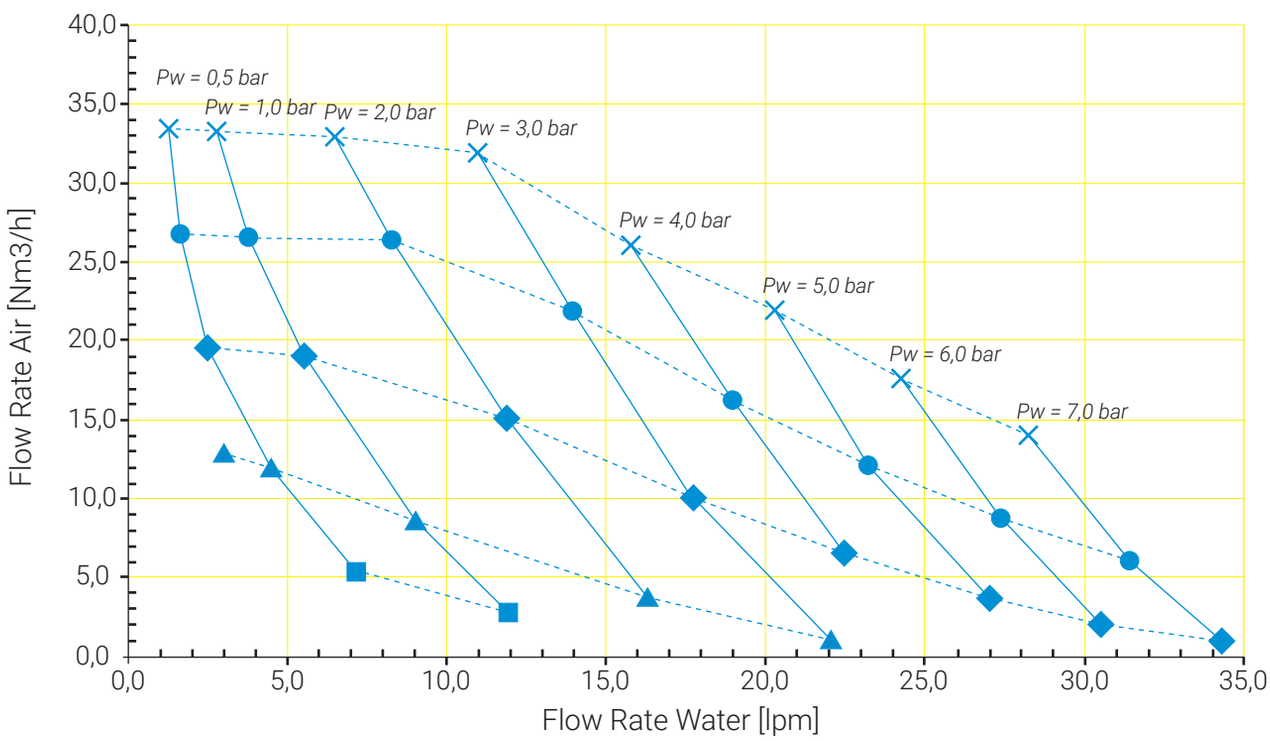
CODE	WATER FLOW RATE (lpm) MIN	MAX	MAX AIR FLOW RATE (Nm^3/h)
MXY BA16A xxxx	2,00	16,0	12,1
MXY BA28A xxxx	5,50	34,4	19,0
	Pw = 1 bar	*Pw = 7 bar*	*Pw = 1 bar*
	Pa = 2 bar		

SPRAY PERFORMANCES CURVES

PNR laboratory can test the atomizers, in order to determine the water-air flow rate diagram at different working pressures. If the customer need it, we can also determine the Sauter Mean Diameter (D32), very useful for problems of thermal exchange.

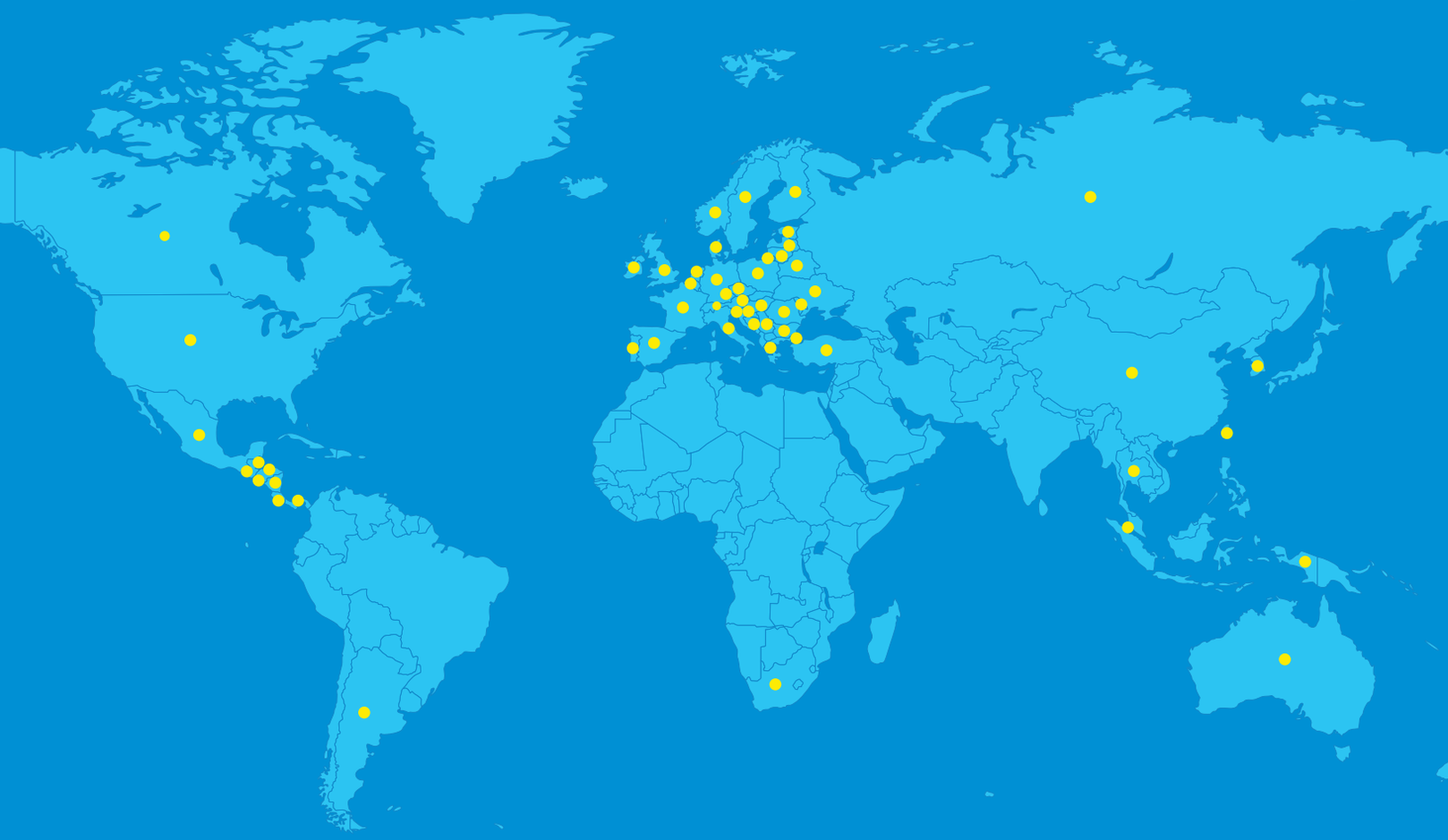
The following image is an example of the graphic we can provide to our clients.

WATER CAPACITY & FLOW RATE VS WATER PRESSURE



- ■ Measurements @ Air Pressure = 0,5 bar
- ▲ Measurements @ Air Pressure = 1,0 bar
- ◆ Measurements @ Air Pressure = 2,0 bar
- ● Measurements @ Air Pressure = 3,0 bar
- × Measurements @ Air Pressure = 4,0 bar

A GLOBAL PRESENCE ALL OVER THE WORLD.



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