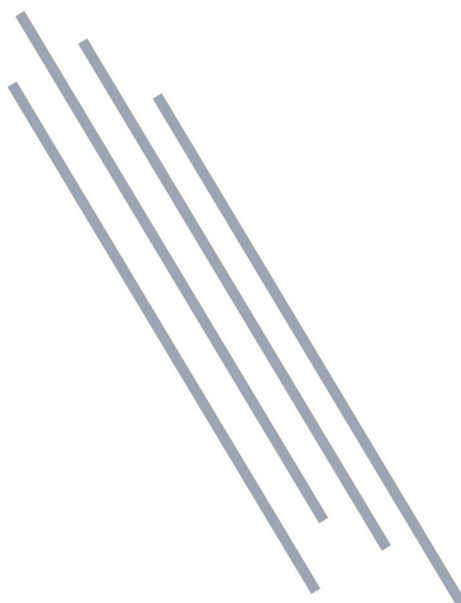
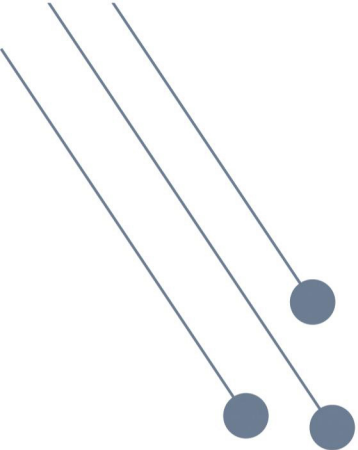
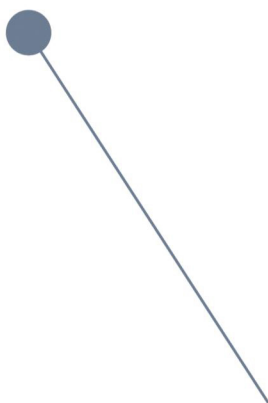




PROFESSIONAL MISTING SYSTEMS  
FOR GREENHOUSES



# Greenhouse Misting Equipment







## ABOUT US

After foundation in 1974, Nor Elektronik Ltd. has focused on hightech manufacturing and high precision machining techniques. Nor Electronic has served for Aerospace and defence industries mainly and decided to invest for manufacturing of professional misting equipments in 2000.

Since that time Nor elektronik has been producing best misting nozzles around the globe thanks to its qualified team, precision machining experience and state of the art machining environment. All parts are being manufactured in its premises except high pressure pumps.

Nor Elektronik's innovative approach has led company to achieve patented Normatic® fast setup push in fittings for greenhouses which eliminates welding of stainless steel tubes.

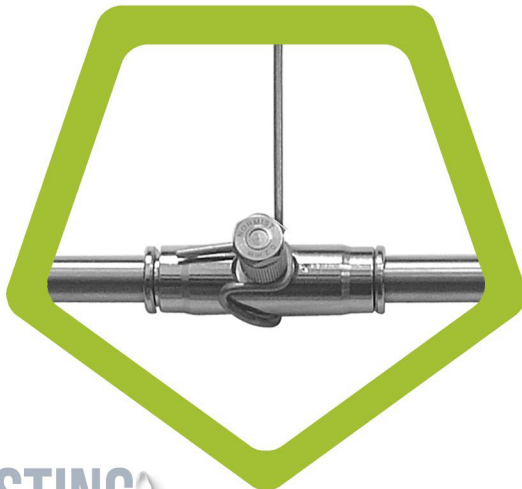
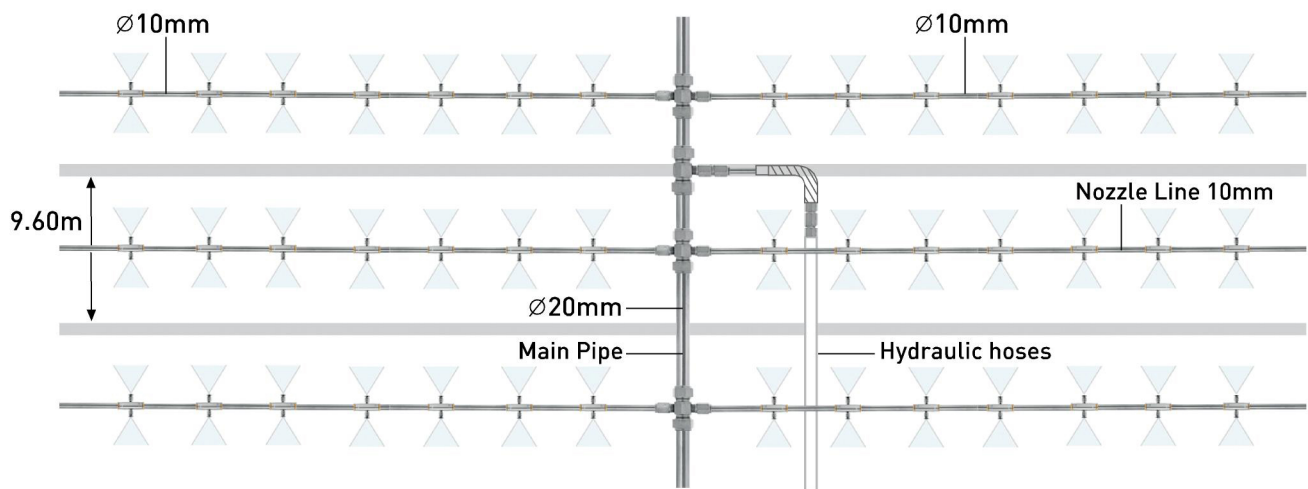
Normist is one stop shopping solution for all clients and a major global player with exports to 88 countries. Company aims 100% customer satisfaction with fast and on time delivery of the systems.





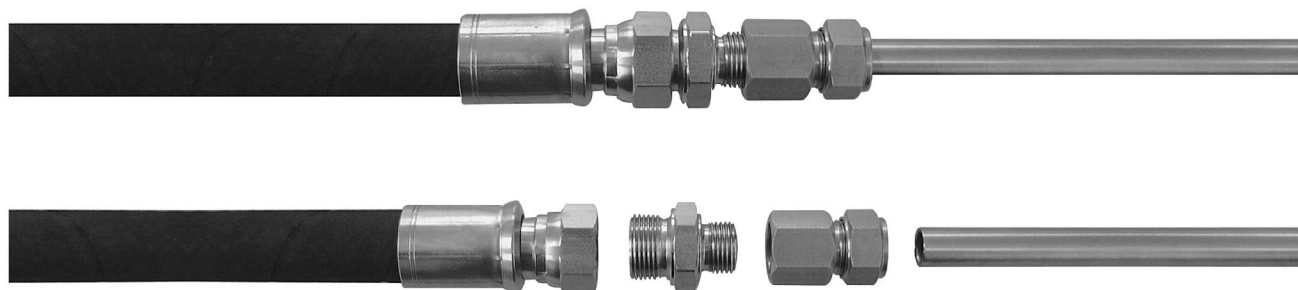


## SAMPLE DISTRIBUTION DIAGRAM FOR GREENHOUSE





## TYPICAL CONNECTION FROM HOSE TO SS PIPE



## GREENHOUSE HP MISTING WITH STAINLESS STEEL PIPES

**STAINLESS STEEL PIPES:** Stainless steel pipes with different diameter are used in greenhouses. All pipes are 304L quality, DIN 17457/DIN 17458, D4/T3 tolerance, annealed and welded. In general 7 different (diameters) are used.

**10x1.5mm stainless steel pipe** is used only on misting lines. Both ends of this pipe are machined to be connected to our patented NORMATIC PUSH-IN Fittings system. Available lengths are 50, 75, 100, 120, 150, 200, 300, 400 cm. Working pressure is 100 Bar, burst pressure is 400 Bar.



100 cm SS 10x1.5 mm pipe for Normatic system



## HYDRAULIC HOSES

Hydraulic hoses are the most economical way for to transfer the high-pressure water from pump room to different sections of the greenhouse.

### SPECIFICATION OF HYDRAULIC HOSES

**Tube:** Mineral, vegetable and hydraulic oil resistant special synthetic rubber.

**Reinforcement:** High tensile steel wire braid.

**Cover:** Oil, abrasion and weather resistant special synthetic rubber.

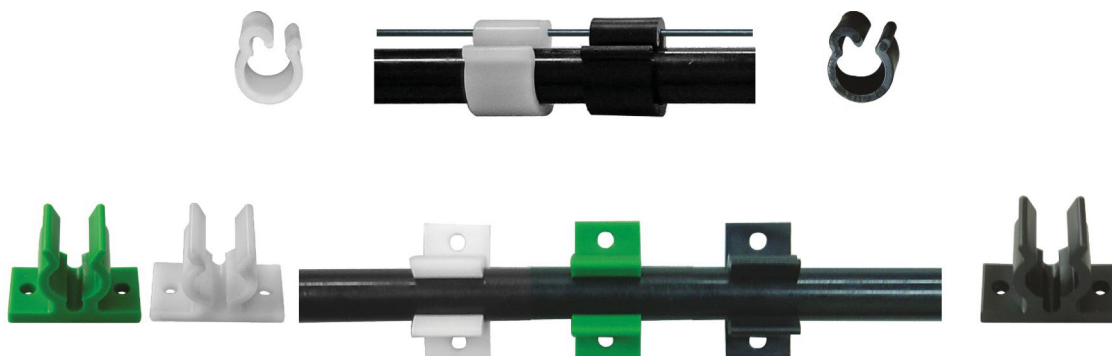


SIZE	INT.Ømm	EXT.Ømm	WORKING PRESSURE BAR	BURST PRESSURE BAR	MINIMUM RADIUS mm
5/16"	8,0	17,1	215	970	115
3/8"	9,5	19,4	180	820	130
1/2"	12,7	22,6	160	700	180
5/8"	16,0	25,8	130	600	200
3/4"	19,0	29,8	105	500	240
1"	25,4	37,6	88	385	300
1 1/4"	31,8	47,3	125	620	420

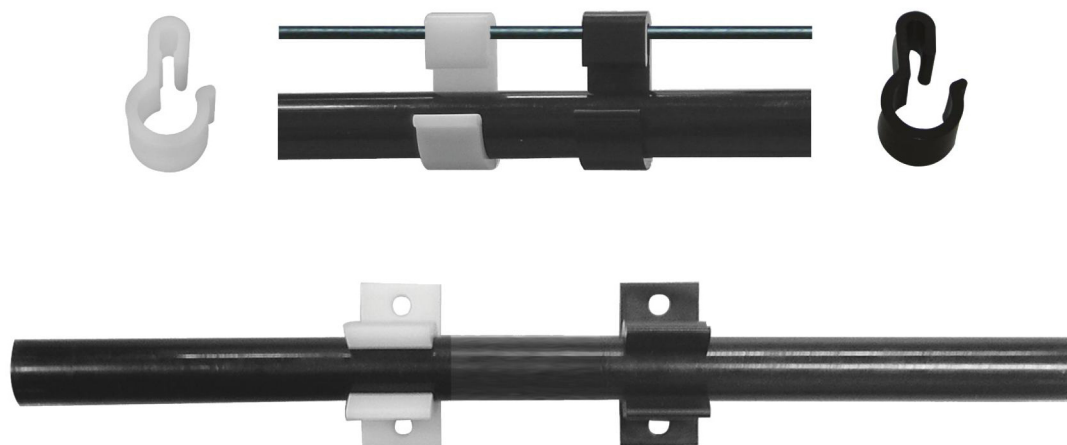




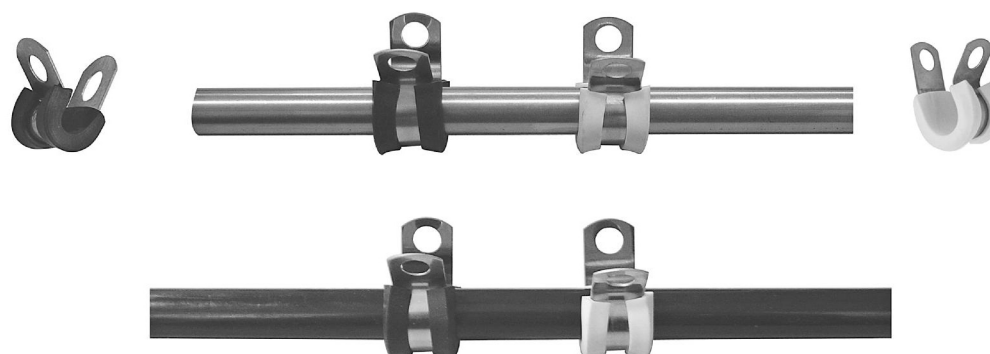
DELRIN HANGERS AND CLIPS  
FOR 3/8" NYLON TUBE 10 mm SS PIPE

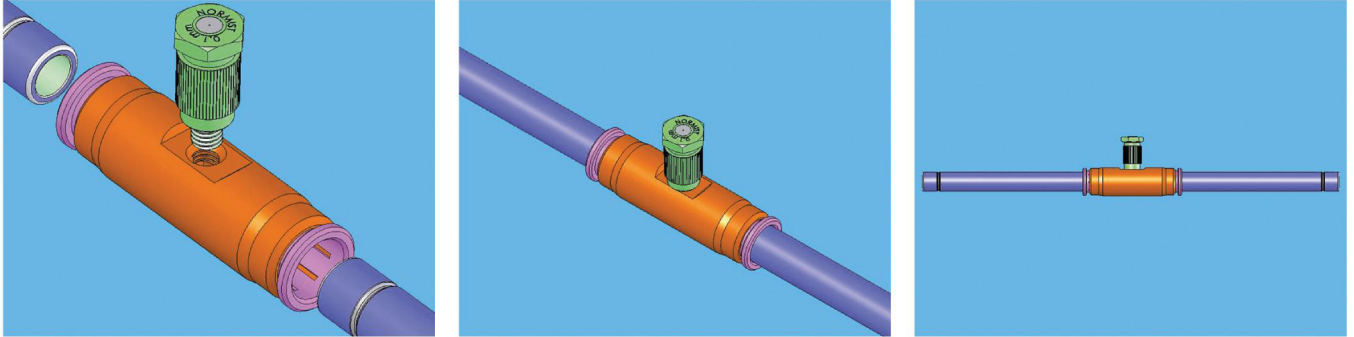


DELRIN HANGERS AND CLIPS  
FOR 1/2" NYLON TUBE 12 mm SS PIPE



SS CLAMPS FOR ALL NYLON TUBES AND SS PIPES





## NORMATIC PUSH-IN fittings SYSTEM

**12x1.5 mm stainless steel pipe** is used as a supply line for 10x1.5 mm pipe or as nozzle line. 3 and 6 meters length pipes are available. With different spacing, they can carry 2 to 12 nozzles. Connection between pipes is made by compression fittings or our NORMATIC PUSH-IN Fittings.



CONNECTION BY COMPRESSION FITTINGS



CONNECTION BY NORMATIC PUSH-IN FITTINGS

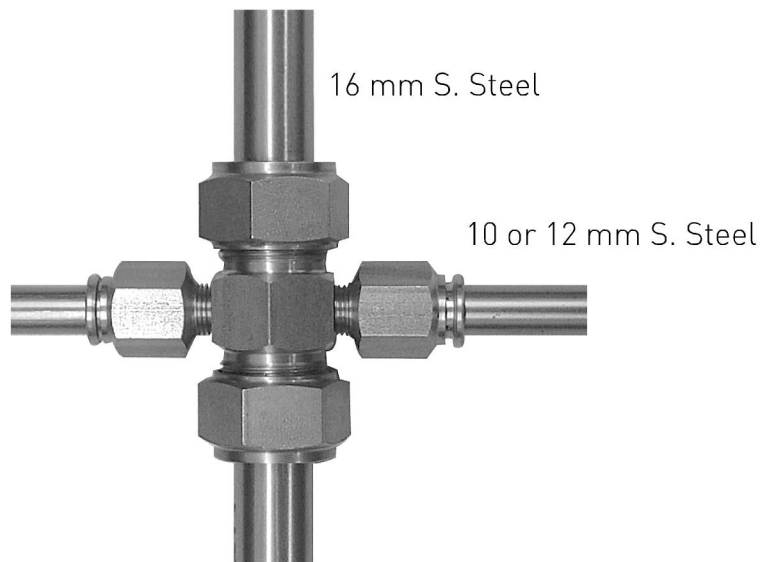


SS PIPE 12 MM. BOTH ENDS ARE MACHINED FOR NORMATIC FITTINGS  
LENGTH 3 AND 6 METERS



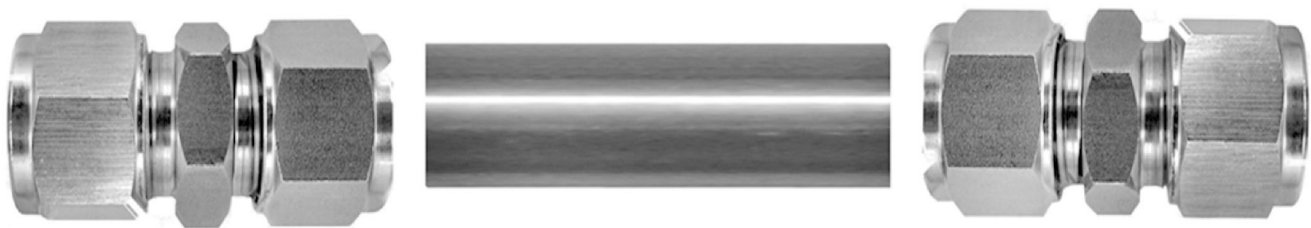
16x1.5 mm stainless steel pipe is used as a supply pipe for 10 and 12 mm nozzle lines. Connection between pipes is made by compression fittings.

### CONNECTION OF 16 mm SS PIPE WITH COMPRESSION FITTINGS



### LARGER SS PIPE SIZE CONNECTIONS WITH COMPRESSION FITTINGS

20x1.5 mm, 25x1.5 and 35x2 mm stainless steel pipes are used as a main supply pipe for 1/2" (12 mm) or 3/8" (10 mm) stainless steel pipes. Connection between these pipes are made by compression fittings.

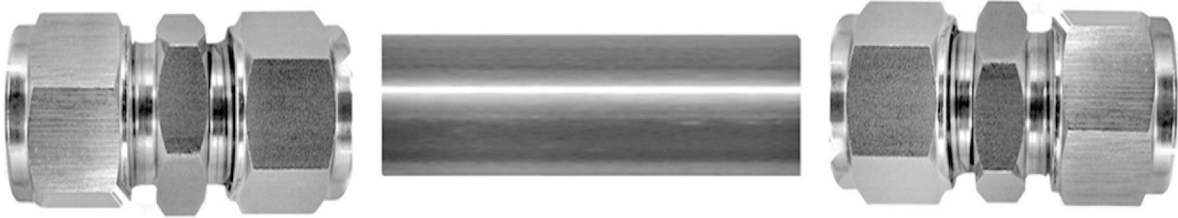




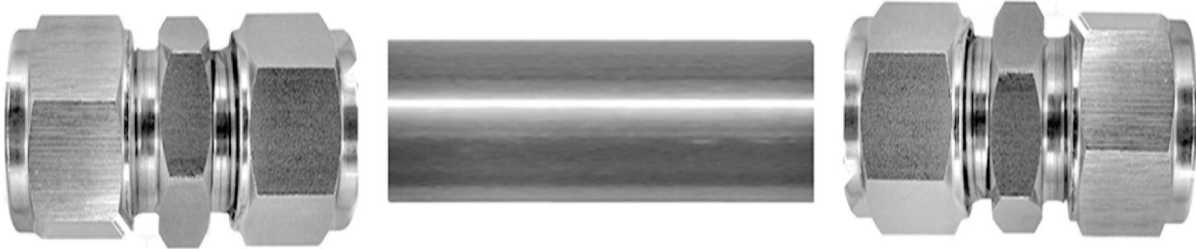
## CONNECTION WITH COMPRESSION FITTINGS

28x2 and 35x2 mm stainless steel pipes are used for to transfer high flow, high pressure water from the pump room of greenhouse to misting sections. Connection between pipes is made by compression fittings or NORMATIC PUSH-IN Fittings.

### 28 mm SS PIPE CONNECTION WITH COMPRESSION FITTINGS

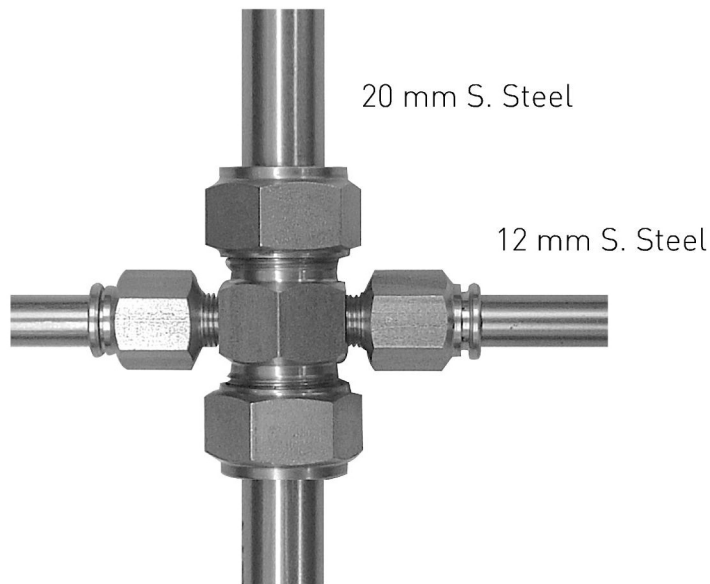


### 35 mm SS PIPE CONNECTION WITH COMPRESSION FITTINGS

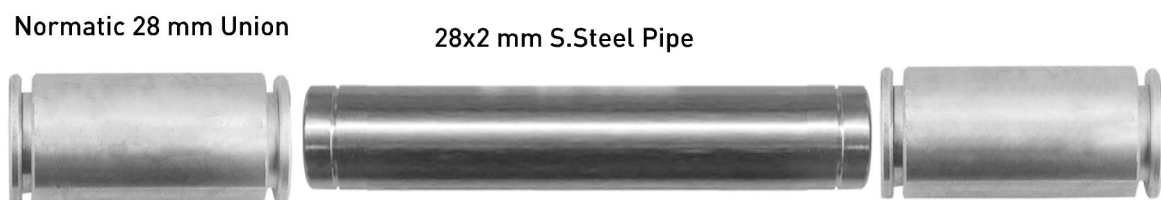




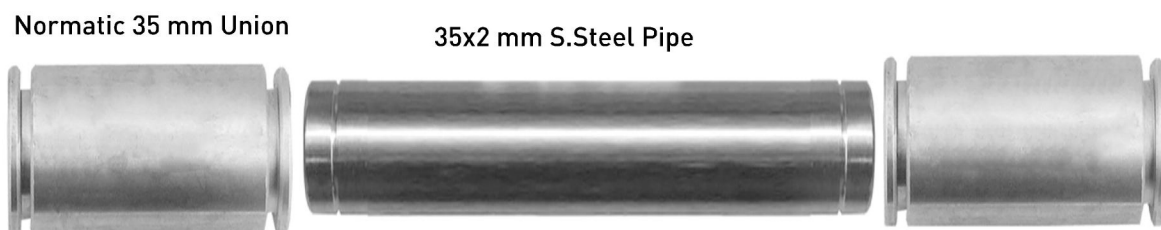
### CONNECTION WITH NORMATIC UNION



### 28 mm SS PIPE CONNECTION WITH NORMATIC UNION



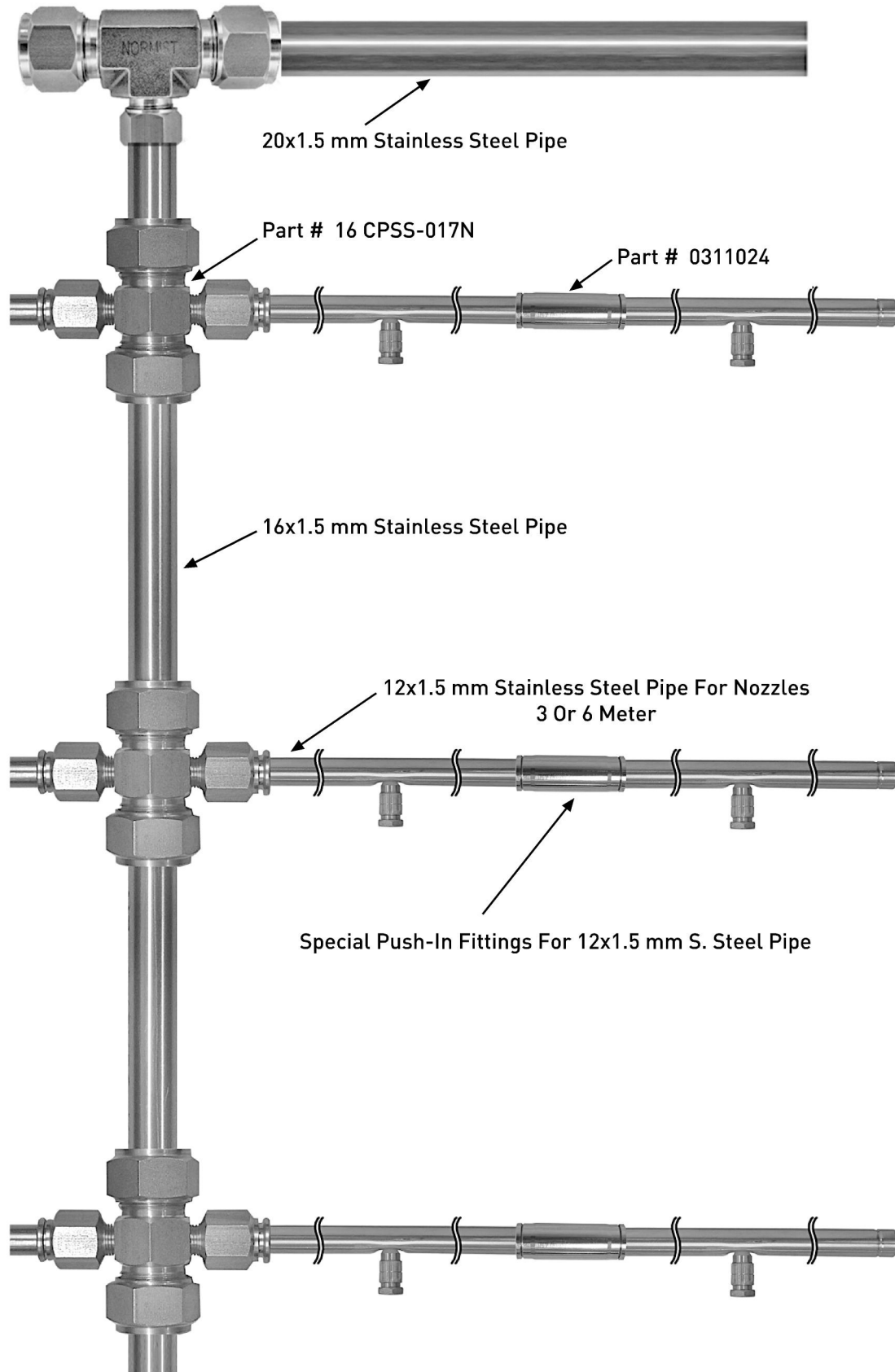
### 35 mm SS PIPE CONNECTION WITH NORMATIC UNION





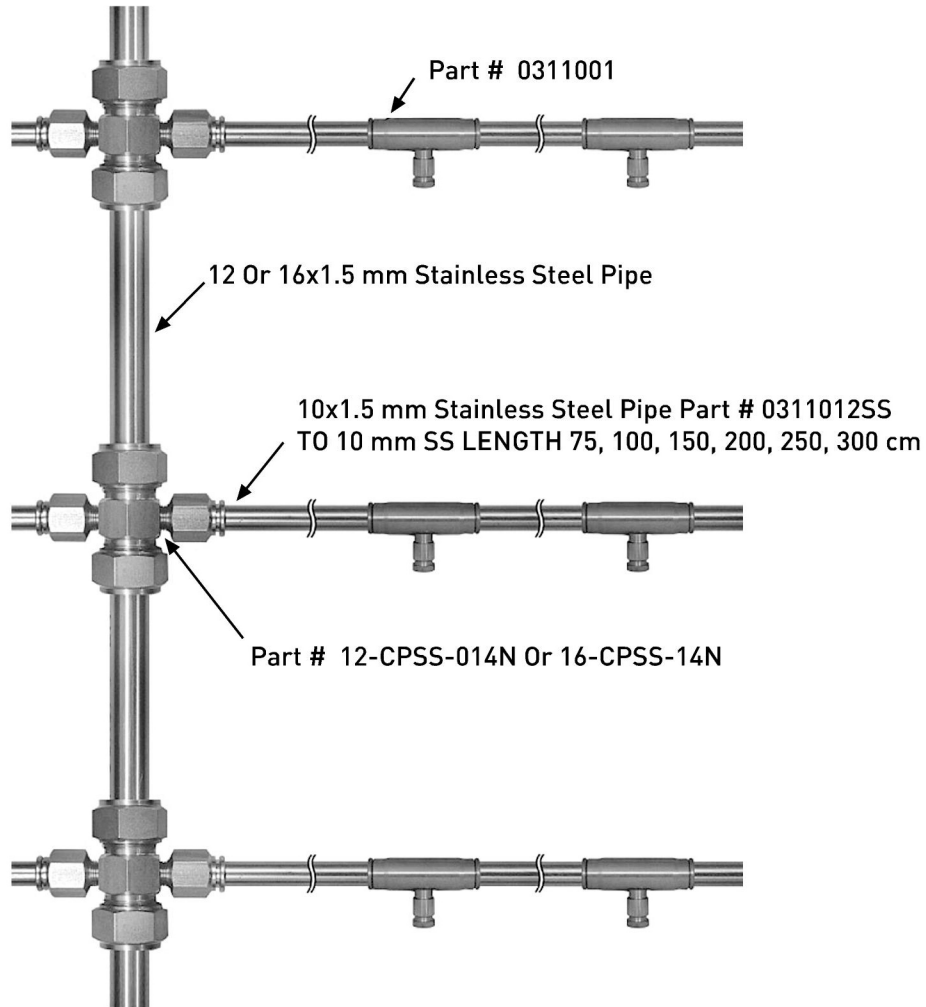
## CONNECTION SAMPLES FOR GREENHOUSES

ALL STAINLESS STEEL WITH 12 mm MISTING LINES

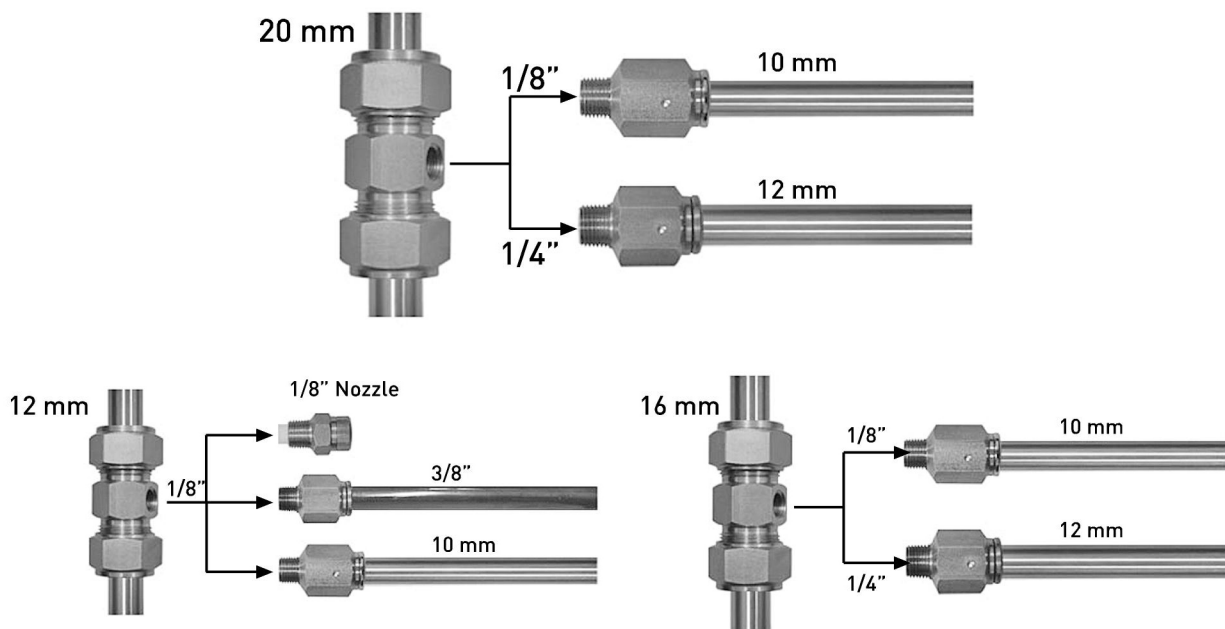




ALL STAINLESS STEEL WITH 10 mm MISTING LINES



USE OF COMPRESSION FITTINGS AND NORMATIC FITTINGS TOGETHER





## NORMIST HIGH PERFORMANCE NOZZLES

CLEANABLE HEX SERIES ALL STAINLESS STEEL 303 OR 316

THREAD SIZE: UNC 10-24, UNC 12-24, M5, 1/8" NPT



### **NORMIST produces the best nozzles in the market. What makes the difference?**

Their tips (orifice part) are from 316L quality stainless steel.

All parts of the nozzles are produced on high precision Swiss and Japanese CNC lathes for attaining very close tolerances.

The orifice of our nozzles is carefully engineered to produce an optimum spray pattern.

Diameter and position tolerance of nozzle orifice is very close. Flows of nozzles having the same orifice are very close.

Our standard nozzle for greenhouses have a 0.3 mm dia. Orifice with flow of 0.115 liter per minute.

Mass Median Diameter size of droplets are around 8 microns.



# A NEW NOZZLE SPECIALLY DESIGNED FOR GREENHOUSES



- NORMIST QUADRO
- 4 X .060 LITER MINUTE
- ORIFICE DIAMETER 0.18 mm
- TOTAL FLOW .24 LITER MINUTE @ 70 BAR

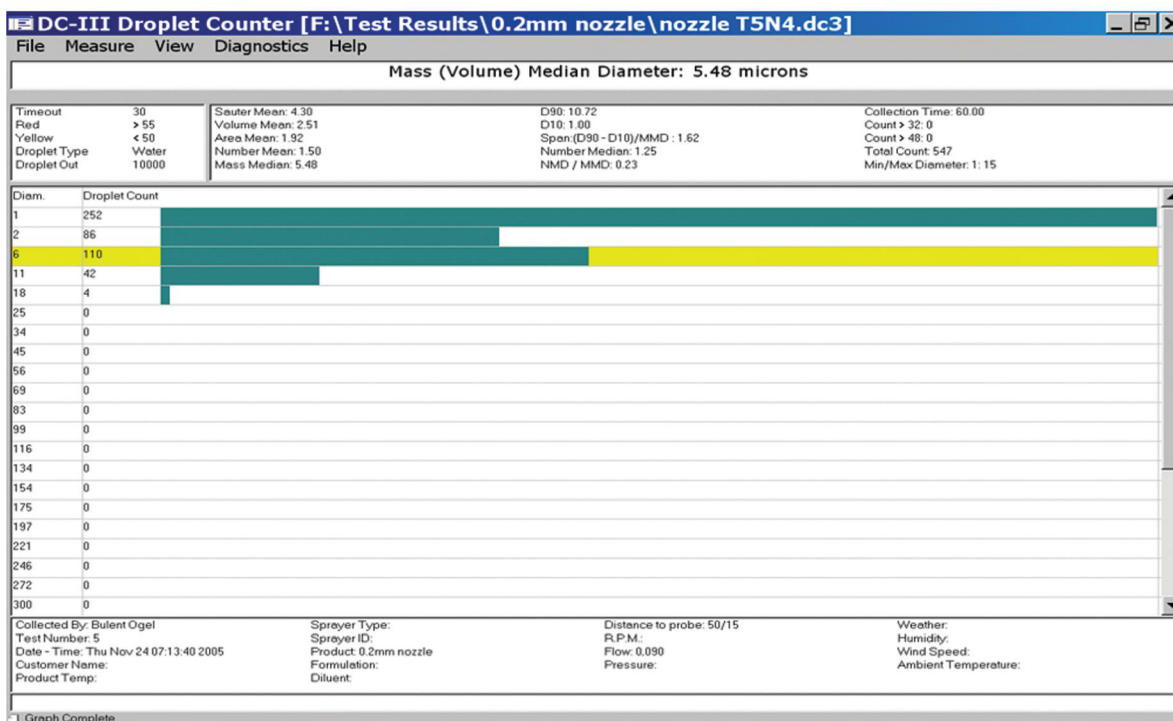
- MASS MEDIAN DIAMETER SIZE OF DROPLETS 5.25 MICRONS
- MORE FLOW AND SMALLER DROPLETS



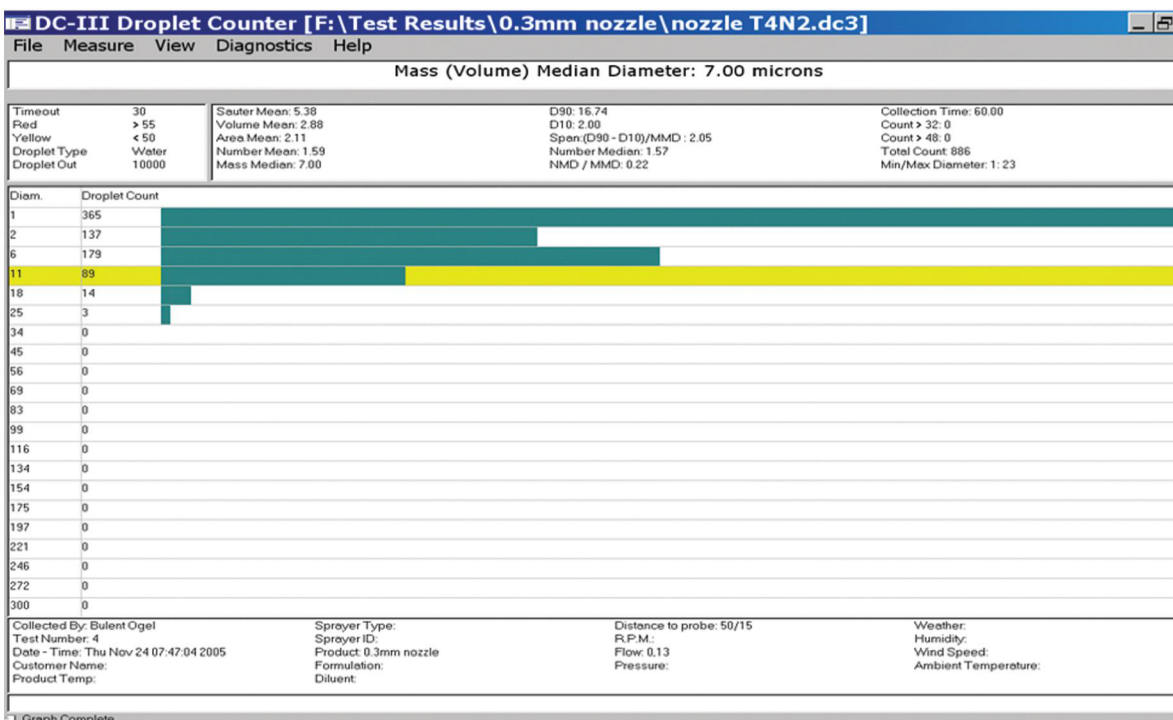
## DROPLET TEST REPORTS



0,2 mm orifice

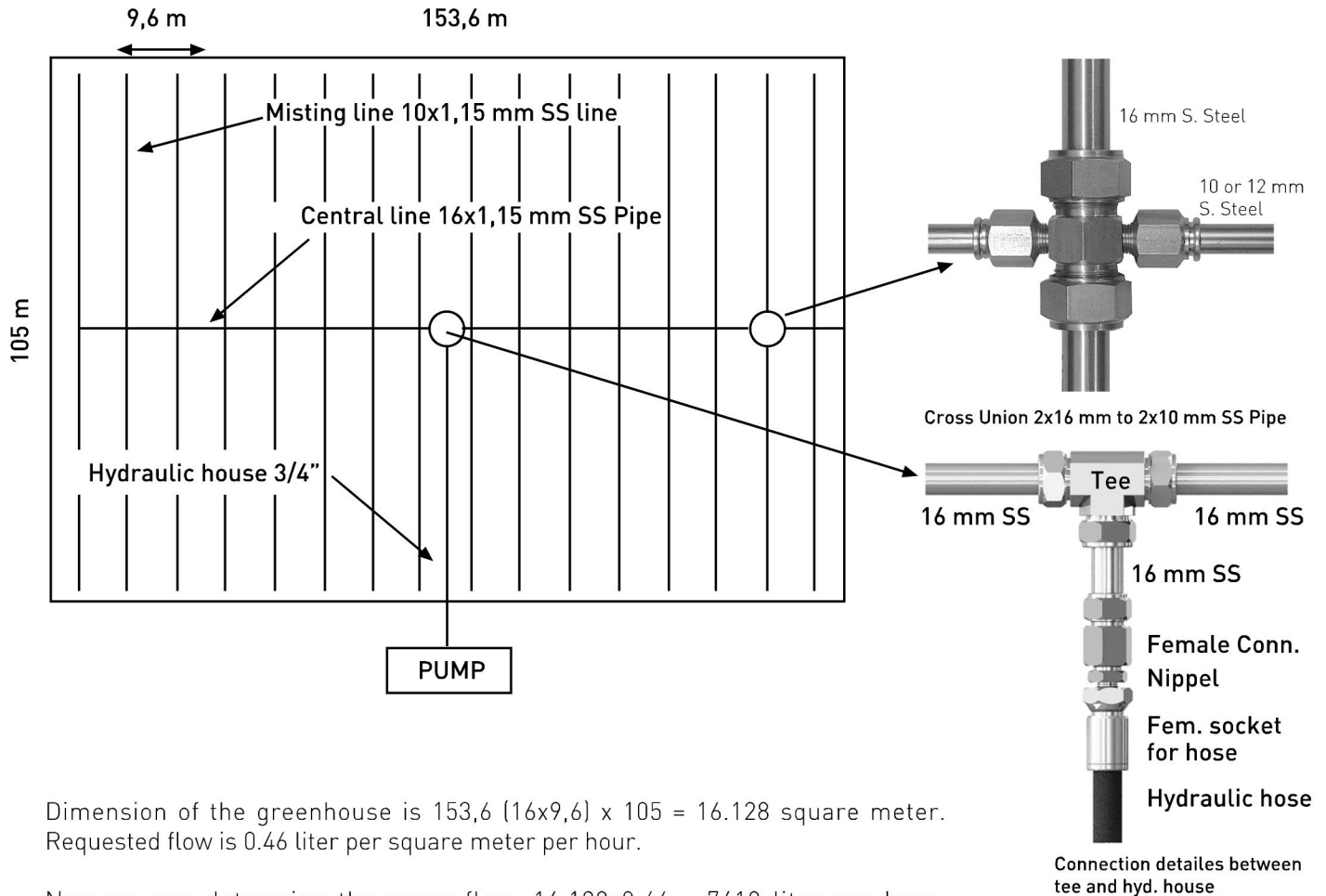


0,3 mm orifice





## HOW TO CALCULATE A GREENHOUSE MISTING SYSTEM Sample Greenhouse Dimensions



Dimension of the greenhouse is  $153,6 (16 \times 9,6) \times 105 = 16.128$  square meter.  
Requested flow is 0.46 liter per square meter per hour.

Now we can determine the pump flow.  $16.128 \times 0.46 = 7419$  liter per hour.  
 $7419 / 60 = 123,6$  liter per minute. We add always + %20.  $123,6 \times 1.2 = 148,32$  LPM.  
We need a pump having 150 LPM or 2 pumps 75 LPM each.

In general 0.3 mm orifice nozzles are used in greenhouse. Flow of these nozzles are 0.115 LPM.

Number of nozzles is  $123,6 / 0,115 = 1074$

This greenhouse have 16 misting lines.  $1074 / 16 = 68$  nozzles per line. Mostiy double nozzle are used. this giv 34 nozzles holders for one line.  $102 / 34 = 3$  meter is the length of the 10 mm stainles steel pipe between 2 nozzles holders.



2x50 lpm pump  
station for greenhouse





## LOW PRESSURE FILTERING



20" BIG BLUE TRIPLE FILTER  
GROUP FLOW 70 LPM

2 X 20" BIG BLUE TRIPLE FILTER  
GROUP FLOW 140 LPM

3 X 20" BIG BLUE TRIPLE FILTER  
GROUP FLOW 210 LPM

STEEL HOLDER FOR 2x20"  
TRIPLE FILTER

STEEL HOLDER FOR BIG BLUE 3x20"  
TRIPLE FILTER GROUP

## INOX STAINLESS FILTERING



STAINLESS STEEL FILTER UNIT

20" AND 30" FLOW 250-800 LPM

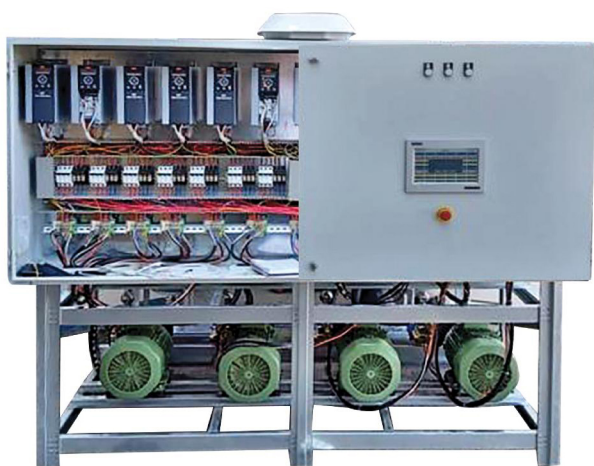
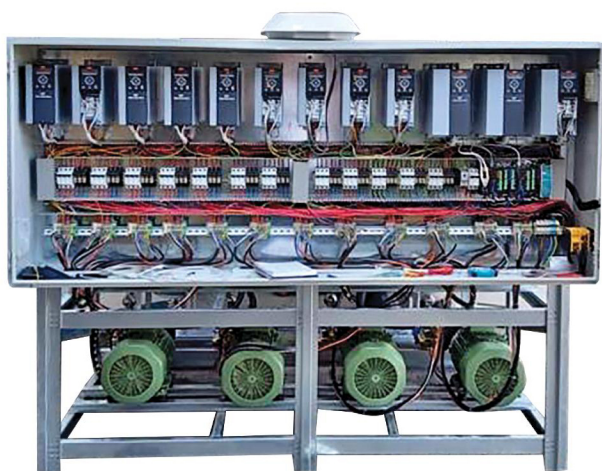


## PUMPS USED ON GREENHOUSE MISTING

PUMP NAME	FLOW LPM	BAR	RPM	KW
ANNOVI R.	36	120	1450	7,5
ANNOVI R.	42	120	1450	11
ANNOVI R.	50	120	1450	11
ANNOVI R.	100	120	1450	22
ANNOVI R.	135	100	900	22
INTERPUMP	70	120	1450	15
INTERPUMP	100	100	1450	22
INTERPUMP	153	130	1000	30
INTERPUMP	170	110	900	37
BERTOLINI	95	105	1450	22
BERTOLINI	155	120	1000	30
BERTOLINI	175	120	1000	37
CATPUMP	45	125	1150	11
CATPUMP	87	140	800	22
CATPUMP	170	70	768	37
HAWK	35	170	1450	7,5
HAWK	40	170	1450	11
HAWK	43	170	1450	11
HAWK	50	170	1450	11
HAWK	54	150	1450	11
HAWK	70	150	1450	15
DANFOSS	45	100	1800	11
DANFOSS	21 TO 56	100	700-1800	11
DANFOSS	29 TO 73	100	700-1800	15
HAWK	36	120	1450	7,5
HAWK	42	120	1450	11
HAWK	50	120	1450	11
HAWK	100	120	1450	22

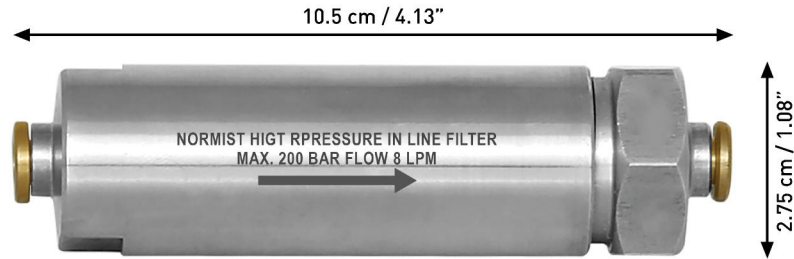


## PUMP STATIONS FOR GREENHOUSES

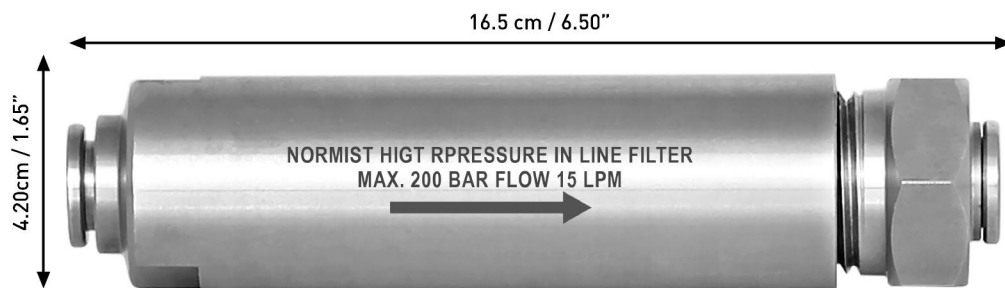




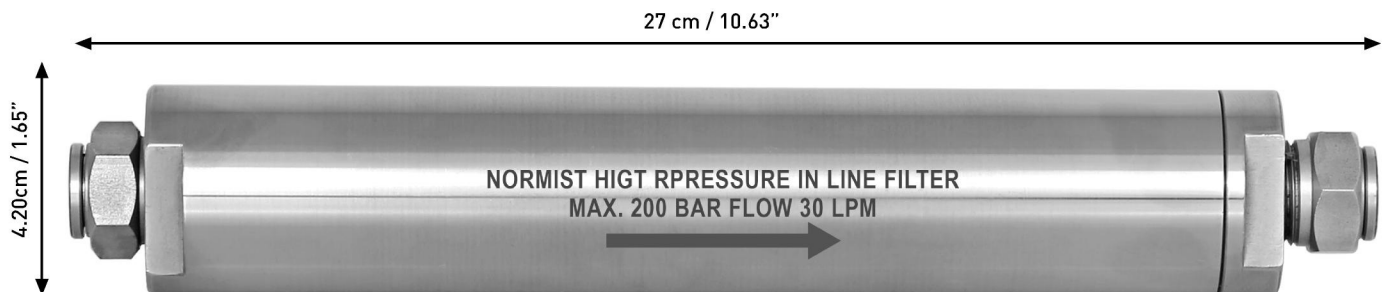
## HIGH PRESSURE IN LINE FILTERS



Material SS 303 Flow 8 Lpm / 2.11 US Gpm Weight .233 g / 0.513 lb

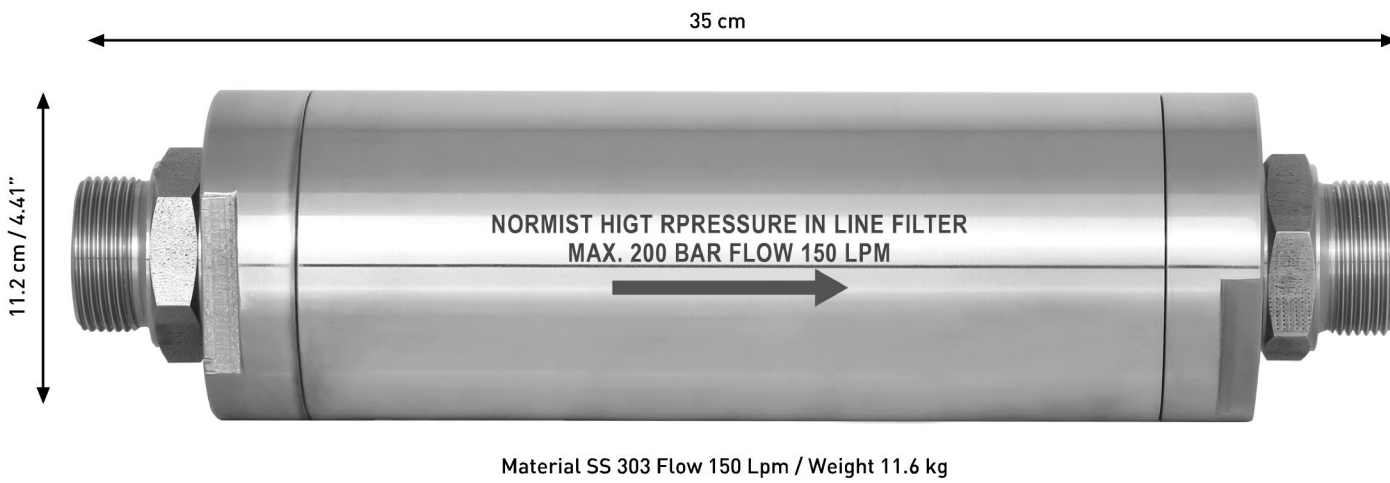
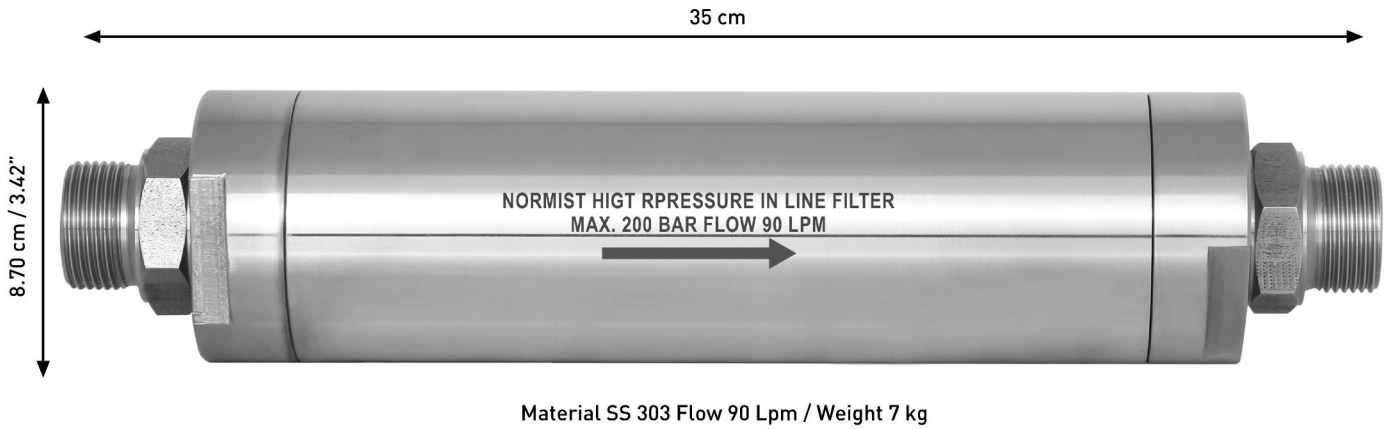


Material SS 303 Flow 15 Lpm / 3.96 US Gpm Weight 855 g / 1.88 lb



Material SS 303 Flow 30 Lpm / 7.92 US Gpm Weight 1106 g / 2.39 lb

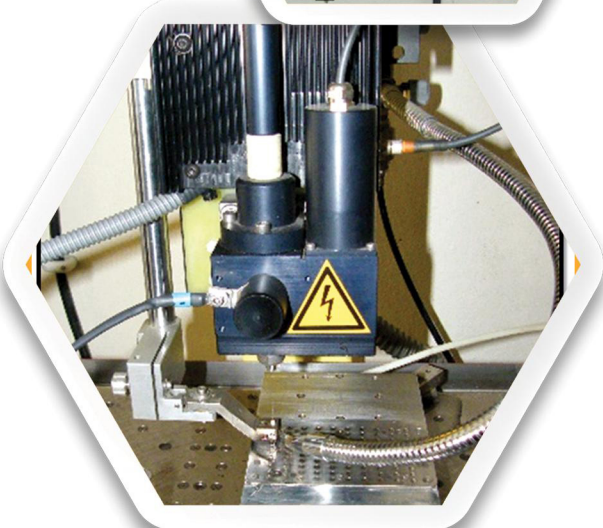
HIGH PRESSURE IN LINE FILTERS







## MACHINE PARK

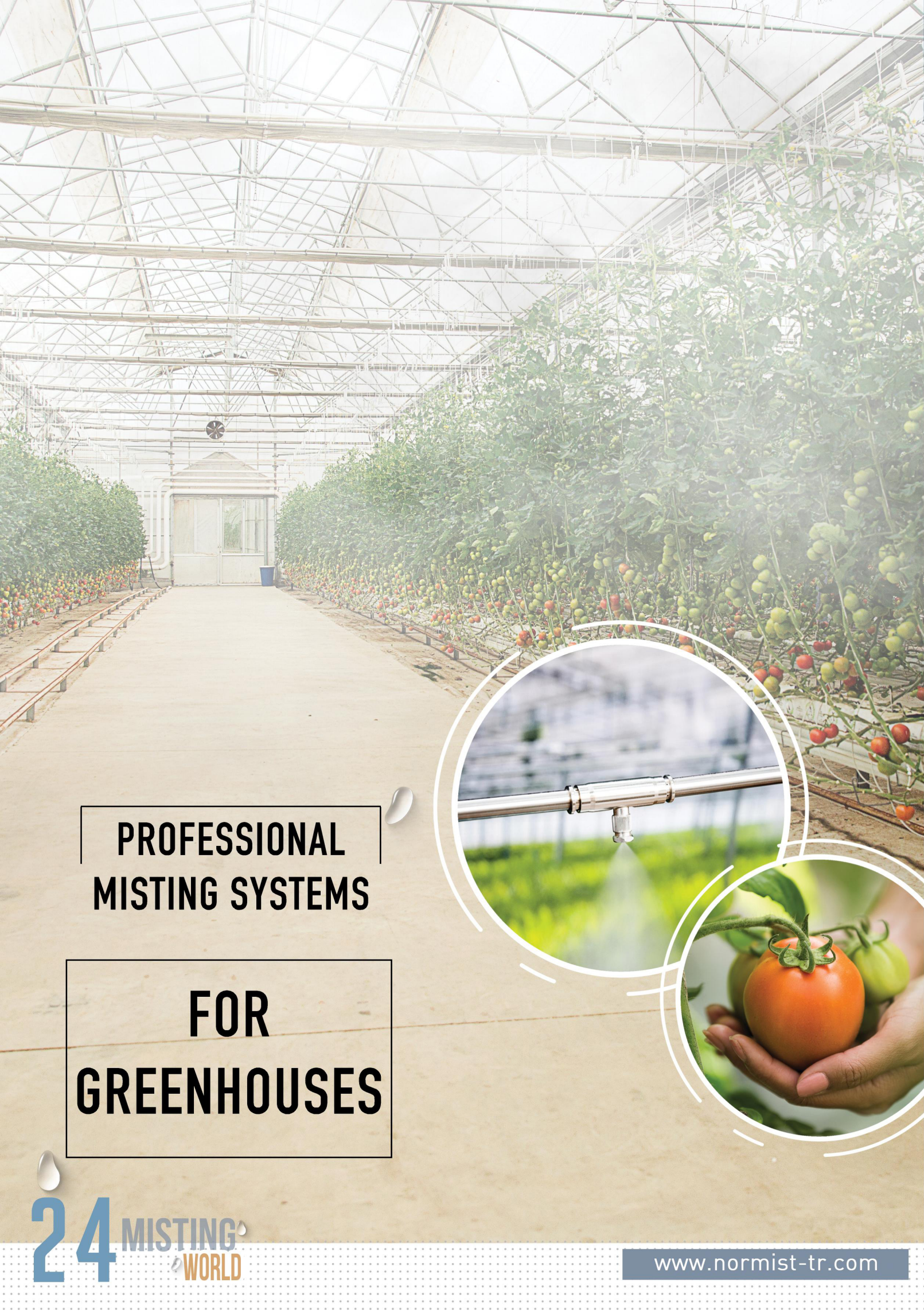




# PROFESSIONAL MISTING SYSTEMS FOR GREENHOUSES



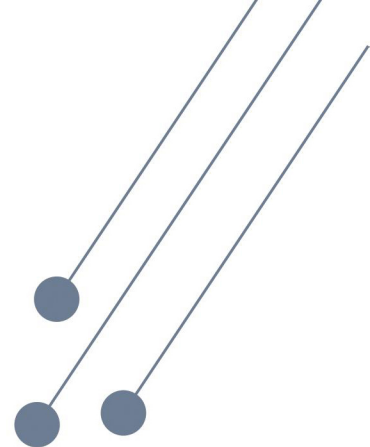
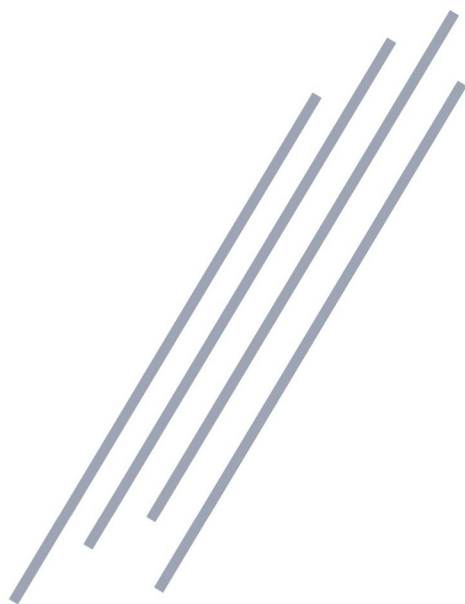




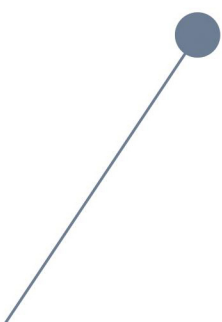
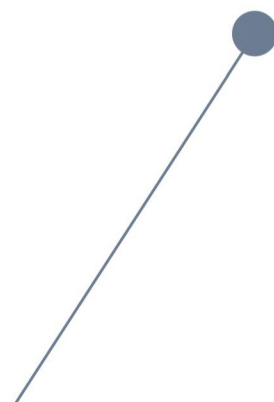
**PROFESSIONAL  
MISTING SYSTEMS**

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GREENHOUSES**





# Greenhouse Misting Equipment





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