

Mulsaem Irrigation Re.

Mulsaem produces and supplies farming resources such as irrigation and convenient tools for farming workers in the 21 century.



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1 Features of watering according to the models of plastic sprinkler



Applications

- Irrigation in greenhouses, gardens, orchards and vegetable.
- Cooling temperature of livestock over the roof etc.

Features

- Mechanical assembly
- Broad range of wetted diameter and flow rates
- Small, medium or large droplets
- Recommended working pressure : 1.5–2.2 bar
- Flow rate : 35–200 ℓ/hr
- Wetted diameter : 1.5–10M
- Filtering requirement : 130 micron Mesh No. 120 ASTM E 11
- Two size intra-filtering structures such as 0.5 and 0.9 mm

Table 1. Technical data of micro-sprinkler according to models.

Division		Watering radius of MSL(M)				Watering radius of MSH(M)			
Nozzle (ℓ/hr) at 2bar	Colors	Upside-up installation height	Upside-down installation height			Upside-up installation height	Upside-down installation height		
		1M	1M	1.5M	2M	1M	1M	1.5M	2M
35	red	2.8	2.2	2.3	2.6	2.4	2.5	2.6	2.8
70	orange	3.2	2.3	2.5	2.9	2.7	3.2	3.3	3.7
100	yellow	3.4	2.5	2.7	3.1	3.1	3.6	3.9	4.5
120	green	3.6	2.7	3.0	3.5	3.3	3.7	4.2	4.7
140	blue	3.7	2.9	3.2	3.6	3.4	3.9	4.5	5.0
200	white	4.2	3.0	3.3	3.7	3.6	3.9	4.5	5.0

2 Mist and Spreaders



MST/H360D-100



MST disassembly



SP/B360D-70



SP/H180D-100



SP/B360D-70Set

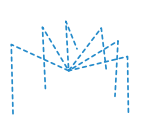
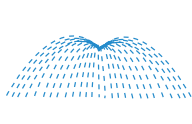
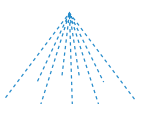
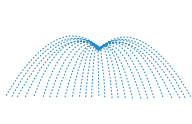
Applications

- Flower beds and pot plants, trees, shrubs etc.

Features

- Wide range of wetted diameters and flow rates such as 35, 70 and 100 l/hr
- Light irrigation with fine droplets
- Assembled with bridge, spike, splitter, stick, supporter and tube etc.
- Full- and part-circle patterns : 180°, 360° with 70, 100 l/hr nozzle

Table 2. Wetted dia.(m) at 2.0bar and 0.1M above ground level.

nozzle color	flow rate at 2bar (l/hr)	Static spreaders				
		180° 24 jets		360° 18 jets		360° Mist
		Flat	Cross range	Flat	Cross range	Flat
Red	35	–	–	–	–	1.0
Orange	70	2.0	1.4	1.5	0.5	1.5
Yellow	100	2.3	1.4	2.0	0.6	2.0
Picture						
Spreading pattern						

*  Nozzles in the green box are prime products.

3 Foggers (US 9381525)

Green color nozzle (Wide spreading fogger)



MSF/SP-20



MSF/SP-20 disassembled



Mushroom bed

Applications

- Misting and irrigation over benches
 - Minimum height⁰ : 1m
 - Max. spacing between lateral⁰ : 0.9m
 - Controlling humidity and temperature
 - Max. spacing between heads⁰ : 0.9m
 - Max. distance of lateral from bench to edge⁰ : 0.1m
- note⁰ : It is applied for the seedling and propagation system.

Features

- Three size intra-filtering structures such as 0.4, 0.6 and 1mm
- Having rooms for debris in intra-structures
- No dripping during operation
- Fine mist without drifting of water droplets
- Perfect threaded union
- Uniform coverage
- Particle size : 71 μ m(@2bar), 66 μ m(@3bar)

White / Blue color nozzle



MSF/S-10



MSF/T-20



MSF/F-40



MSF/S-5



MSF/T-10



MSF/F-20

Applications

- Controlling humidity and temperature
- Providing good conditions for plant raising

Features

- Three size intra-filtering structures such as 0.4, 0.6 and 1mm
- Perfect threaded union(1 or 2 emitters) with anti-drainage(blue)
- Bayonet assembly(4 emitters) with anti-drainage(black)
- Having rooms for filtered debris in intra-structures
- Filtering requirements : 130 micron(120 mesh no.)
- Uniform coverage
- PE and PVC connections
- Fine droplet size
- Anti-drainages are available

Table 3. Fogger flow rate (ℓ/hr) according to the applied pressure

Nozzle color		Green	Blue	White
Pressure (bar)	1	20	–	–
	2	29	4.5	13.4
	3	33	5.4	16.0

Table 4. Micro fogger technical data of MSF

Model	Applied pressure @ 2bar		Applied pressure @ 3 bar	
	Flow rate (ℓ /hr)	Average droplet size (μm)	Flow rate (ℓ /hr)	Average droplet size (μm)
MSF/SP-20	29	72	33	66
MSF/T-10	9	68	10.8	65
MSF/T-20	18.0		21.6	
MSF/F-20	26.8	67	32.0	64
MSF/F-40	53.6		56.0	

Table 5. Micro fogger application and recommended spacing¹

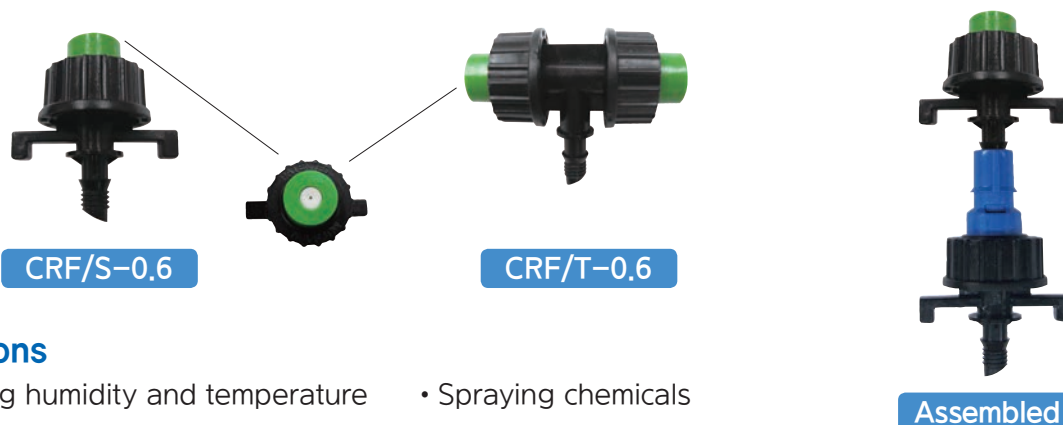
Model	For climate control (Cooling & humidifying)	For pesticide spraying	For propagation ²
MSF/T-10	1.5×3.0 m 2.0×4.0 m	1.5×3.0 m –	–
MSF/F-20	3.0×3.0 m 2.0×4.0 m	–	1.0×1.0 m
MSF/T-20	1.5×3.0 m 2.0×4.0 m	1.5×3.0 m –	–
MSF/F-40	3.0×3.0 m 2.0×4.0 m	–	1.0×1.0 m

note 1 : Distance between heads × distance between laterals

note 2 : At 1.0m height above table/plants note 3 : Maximal operation pressure below 4 bar.

* It is recommendable that filtration mesh hole size should be approximately 10 times smaller than nozzle size in the watering resources for irrigation and in the fogger to control humidity and temperature.

Ceramic foggers



Applications

- Controlling humidity and temperature
- Spraying chemicals

Features

- Three size intra-filtering structures such as 0.4, 0.6 and 1mm
- Having rooms for debris in intra-structures
- Extra fine droplet size : 54~58μm@ 4~9bar
- Recommendable operation pressure ranges from 3 to 9bar
- Filtering requirements : 130 micron(120 mesh no.)
- Flow rate 9.8 ℓ /hr at 4~9bar
- Anti-drainages are available

Mulsaem Irrigation Re.

Vortex ultra micro foggers : using with pressurized water and compressed air

►Venturi type (Pat. US10,183,302 B2)



►Cap type (Pat. KR 10-1965427)



Application

- 1) Controlling temperature and humidity 2) Spraying chemicals 3) Phytosanitary
- 4) Vaccination 5) Reduction of odor 6) Dust suppression
- 7) Static electricity control 8) Foliar treatment 9) Disinfectant

Feature

- 1) The atomizing direction of Venturi type(IVF/S-xx, IVF/T-xx) can be easily changed.
- 2) Low compressed air consumption and easy maintenance
- 3) Resistance to wear and abrasion 4) Easy to install air and water lines
- 5) No need of reverse osmosis system or decalcification water treatment
- 6) Good weatherability
- 7) Long atomizing spray distance is dependent on the air/water pressure ratio.

Table 6. Air flow rate and atomizing amount of water in the conditions of their applied pressure.

Model	Applied pressure of Air/Water (bar)	Atomizing amount (ℓ /hr)	Consumption of air (ℓ /min)	Sauter Mean Droplet Dia. (μm)
IVF/x-N08	2	2.0	21	24
	3	2.4	29	22
ICF/x-N09	2	1.5	15	23
	3	1.7	20	22
ICF/x-N09	2	2.1	19	22
	3	2.3	25	19

* Before it is applied, you 'd be better to have a test. Above data are for reference.

Ultra micro foggers : using with compressed air(External 2fluids foggers)



Recycling Textile



Textile Weaving

Application

- 1) Controlling humidity
- 2) Spraying chemicals in a small room
- 3) Reduction of odor as spraying chemicals
- 4) Dust suppression
- 5) Static electricity control
- 6) Disinfectant

Feature

- 1) Easy maintenance
- 2) Resistance to wear and abrasion
- 3) Easy to install air and water lines
- 4) No need of reverse osmosis system or decalcification water treatment
- 5) Good weatherability
- 6) Long atomizing spray distance

Table 7. Air flow rate and atomizing amount of water in the conditions of their applied pressure.

Model	Applied pressure of Air/Water (bar)	Atomizing amount (ℓ/hr)	Consumption of air (ℓ/min)	Sauter Mean Droplet Dia. (μm)
ECF/x-N09	2	2	40	19.3
	3	2.2	43	16
ECF/x-N13	2	2.7	38	17.4
	3	3	45	15.6

* Before it is applied, you 'd be better to have a test. Above data are for reference.

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Anti-drainage (Pat. KR 10-1551471)



MS/NTDR



MS/NTDR-T



Combination pictures as some examples

Applications

- Preventing drainage through emitters
- Keeping system under specific pressure to start-up immediately
- Allowing all units to start-up or shut-down simultaneously
- Minimum pressure loss with high flow rates
- Easily disassembled for cleaning and maintenance
- PE and PVC connections

Features

- Uni-axial opening and closing with wide gap
- Modular-fits such as bayonet and threaded connection
- No disconnection assembled with threaded modular-fits because of contraction and expansion of materials according to temperature change



Duck livestock



Pepper bed

5

Line flush auto-valve (Pat. US 9, 016, 310 B2)



F/V-N(0.1)



F/V-N(0.2)



Application for drip pipe



F/V-T(0.1)



F/V-T(0.2)



F/V-N(0.6)



Application for sprinkler, fogger etc

Overview

Suitable for diverse irrigation applications, our automatic flush valves clean out the dripper line at the beginning of each irrigation cycle and reopen prior to the next cycle. In addition, it can help to performs irrigation in the throughout pipe line at the same time.

Features and benefits

- No moving parts for reliable operations
- Resistance to chemicals and fertilizers
- Simple structure for easy assembly and disassembly
- Automated system for labor savings
- Three different colors mean closing pressures such as 0.1, 0.2, 0.6bar
- Low sensitivity to water quality
- Resistance to light and weather

Operation

- Normally opened at the beginning of irrigation
- Flushing while pressure builds up in lateral, water velocity flushes the debris out through opening
- Closing when small quantity of water is filled with below chamber, the diaphragm seals openings. Then it gradually opens again.



Cherry farm



Apple orchard



Papper farm

6

Stick and splitter (KR 10-2039668)



Splitter



Stick



Disassembly



Totally assembly



Pole stick assembly

Overview

The assemblies of stick, splitter, bridge, nozzle and static spreaders or swivels are one of the most effective and versatile solutions for a quick installation of a small-diameter above-ground watering system. The spray stick is now available as a completely assembled unit with Ø3/5mm vinyl tubing with a barb. In addition, the closed barb of the end in the splitter can be cut to open and extended to connect another splitter with the Ø3/5mm vinyl tube for other watering place. These combinations are useful for pots, baskets, containers and new plantings, and a favorite among nurseries and growers.

Features and benefits

- Available in a 160~180° and 360° spray pattern
- Recommended for pots, planter boxes, container plants or closely spaced plantings
- A variety of combinations to be ready to install

Operation

- Operating pressure range : 1~2 bar
- Flow rate : 20~100 l /hr
- Pattern : 160~180° and 360° flat or cross range(downward)
- PVC tubing size used : Ø3/5 mm with ID x OD
- Filter requirement : 120 mesh

Materials

- Stick : POM
- Splitter : POM
- Tubing : PVC
- Others : POM



Application in the narrow bed

7

Others

Female threaded saddle Do x dth = 20 x M6 with silicone seal



Female threaded screw



Hanger



Silicone seal



Assembled

Merits

- 1) In spite of many times of connections, no leakage of water
- 2) Easy to assemble and disassemble for the maintenance of nozzles
- 3) Useful for aeroponic systems to install nozzles under the root of plant

Female and male threaded nipple : M6 x 1(PT)



installed on the pipe

Merits

- 1) In spite of many times of connections, no leakage of water
- 2) Useful for aeroponic systems to install nozzles under the root of plant

Bronze barb with threaded($\phi 4/7$) screw($1/4" \times 0.907$ (PT) UNF)



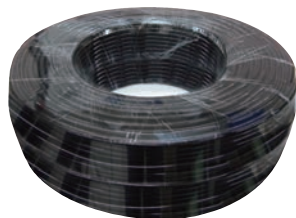
Plastic barb with threaded($\phi 4/7$) screw(M6 x 1(PT))



Plastic barb($\phi 4/7$)



$\phi 4.5/7.5$ PVC tube(200m/role)



$\phi 3/5$ PVC tube(200m/role)



Hanger weight



Application in the 2 fluid fogger



Application on the apple tree

Overseas Letters of Mulsaem Patent

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(54) 发明名称

用于低压的自动水关断阀

(57) 摘要

本发明涉及一种用于低压的自动水关断阀。该阀能够在压力下自动打开和关闭流体。该自动水关断阀(1)在流体的流动方向上控制流体,并包括:主体(2),该主体朝其下部形成螺纹连接(21)、橡胶膜(3),该橡胶膜插入形成在主体(2)的上侧的突出螺纹管(22)中;以及压力保持件(4),该压力保持件在由紧固至所述突出螺纹管(22)的固定套(5)加压的情况下使所述橡胶膜(3)加压。所述压力保持件(4)和所述固定套(5)分别成为具有排出孔(45)和排出孔(51),使得流体在该流体可为压缩空气或处于标定压力以下时可通过形成在所述橡胶膜(3)的中央处的液体堵塞孔(35)能自然地排出,并且当该流体为不可压缩液体或处于标定压力以上时所述橡胶膜(3)的液体堵塞孔(35)被制成在形成在所述压力保持件(4)中的流体突然突起(44)从而使得流体关闭。

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(54)发明名称

双孔增压泵和 喷嘴 16度 喷嘴 7度

低压增压喷嘴

(57)摘要

本发明涉及低压增压喷嘴,包括:喷嘴器主体,在管壁平面的上侧形成有螺旋槽,在螺旋槽的上端形成有流体引导部件安置盒,并形成有用水供应孔;流体引导部件,形成有导引管和套紧凸缘,分别形成于安置盒在流体引导部件安置盒上侧的导引管的下侧和上侧,并且,形成有导引供应体的流路;喷嘴主体,形成有弧形状的结合凸缘,该结合凸缘形成于插入孔的上侧,插入孔用于插入形成于喷嘴器主体的流体引导部件安置盒和流体引导部件的导引管,并且,在插入孔的上侧形成有流体流路,在中央形成有与流体流路相连接的喷嘴孔;喷嘴器盖,形成有加工压环,该加工压环连接于喷嘴主体形成的卡止缘,并在内部形成有与形成于喷嘴器主体的螺旋槽结合的螺旋槽。

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(54)发明名称
微型喷雾器形成装置及喷雾形成方法
(5)摘要
本发明提供一种微型喷雾器形成装置及喷雾形成方法,适用于塑料树等设施栽培用途或口渴等,以喷射如雾一样的微细水粒子的用途使用,该微型喷雾器形成装置包括:低压喷嘴器,在低压下形成喷雾,以提供比普通使用的低压喷嘴器形成更细的喷雾;文丘里管喷嘴,以插入式结合于在低压用喷雾器突出的喷嘴主体的结合管,对由低压用喷雾器供应的水粒子进行微粉碎而喷射,所提供的微型喷雾器形成装置及喷雾形成方法具有如下效果,将水和压缩空气(流体)使用量降到最低化,而增大喷雾效率。

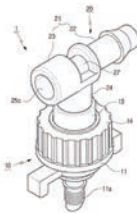


图1

CN 102809111 B