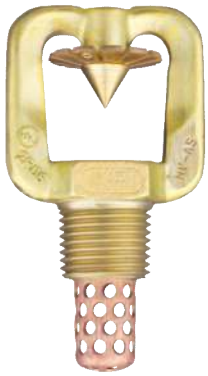
MEDIUM VELOCITY WATER SPRAY NOZZLE

MODEL: MV-A & MV-AS
MV-B & MV-BS
MV-E

TECHNICAL SPECIFICATION

Maximum Working Pressure	12 Bar (175 Psi)
Effective Working Pressure	1.4 to 3.5 Kg/Sq.cm (20 - 50 PSI)
Working Pressure	(20 - 50 Psi)
End Connection	½" BSPT (½" NPT Optional)
Material	Refer Table-I
Included Water Spray Angle For Each K-Factor	140°, 120°, 110°, 100°, 90°, 80° & 65°
K Factor	MV-A/MV-B & MV-E: Metric (US): K-18 (1.26), K-22 (1.54), K-30 (2.10), K-35 (2.45), K-41 (2.87), K-51 (3.57), K-64 (4.48), K-79 (5.53), K-91 (6.37), K-102 (7.14) MV-AS/ MV-BS: Metric (US): K-18 (1.26), K-22 (1.54), K-30 (2.10), K-35 (2.45), K-41 (2.87)
Weight (Approx)	0.110 Kg
Finish	MV-A & MV-AS Natural Brass finish. Chrome plated Nickel, Electroless Nickel plated,Epoxy powder coated. MV-B, MV-BS & MV-E Natural Finish
Ordering Information	Specify K-Factor, spray angle, finish, model and end connection.



The SHIELD Medium Velocity Water Spray Nozzles are open type (non-automatic nozzles, designed for directional spray application in fixed fire protection system.

Medium velocity water spray nozzle has an external deflector, which discharges water in a directional cone shaped pattern of small droplet size. The water is uniformly distributed over the surface to be protected.

The Nozzles are effectively designed to apply water to exposed vertical, horizontal, curved and irregular shaped surfaces to allow cooling to prevent excessive absorption of heat from external fire and avoid structural damage or spread of fire. In some application nozzles may be installed to control or extinguish the fire depending on water design density as per applicable codes. The nozzle is used in deluge water spray system for special hazard fire protection application.

As the design and intent of specific water spray system may vary considerably, MV nozzle is made available in several combinations of orifice sizes and spray angles.

The minimum desirable pressure to achieve a reasonable spray pattern is 1.4 Kg./Sq.cm. The water distribution pattern as shown in the graph in following pages is at an average pressure of 2.0 Kg/Sq.cm. The change in pressure between 1.4 to 3.5 Kg./sq.cm. does not affect considerable change in spray angle.

The spray pattern shown is with indoor application. System designer must consider wind velocity while designing the system for outdoor application. Field obstruction if any affecting the spray pattern of the nozzle must also be considered. The nozzle may be oriented to any position as deemed necessary to cover the hazard

The Blow-off plugs can be used to prevent the depositing of foreign materials in the waterway of the nozzles, which could interfere with discharge of the spray nozzle. Blow-off Plugs have identification mark with respect to K factor. Blow off plug for nozzle having K factor 22 will have identification mark of 22. Minimum operating pressure for nozzle having Blow-off plug is 1.4 Kg./Sq.cm (20 PSI).

The main pipeline strainer as per NFPA-15 is required for system utilizing nozzle orifice diameter less than 9.5mm (3/8 inch), i.e. MV Nozzle having K-factor 51 and less, and also for the system water likely to contain obstructive materials.

INSTALLATION & MAINTENANCE

The spray nozzle must be handled with due care. For best results, the storage as well as any further shipment be made in original packing only.

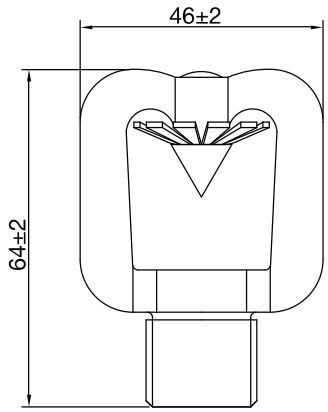
Nozzle which is visibly damaged should not be installed. Use Teflon tape or soft thread sealant on male thread of the nozzle. The nozzles must be hand tightened into the fitting. After hand tightening use Nozzle Wrench for wrench tightening in to nozzle fittings. Excessive tightening torque may result into serious damage to nozzle arms and the deflector, which may affect spray pattern of the nozzle and its performance.

It is recommended that water spray system be inspected regularly by authorised technical personnel.

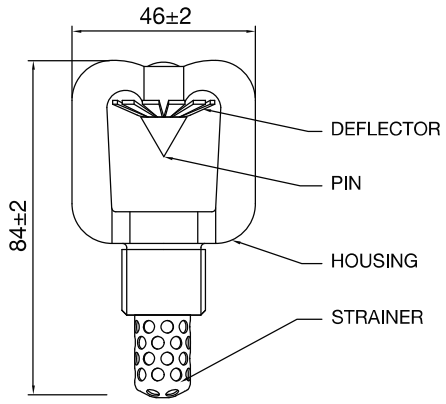
The nozzle must be checked for atmospheric effects, external and internal obstruction, blockage if any. The system must be operated with optimum water flow at least twice in a year or as per the provisions of NFPA / TAC or local authority having jurisdiction.

The owner is solely responsible for maintaining the water spray system and the components there in so that it performs properly when required.

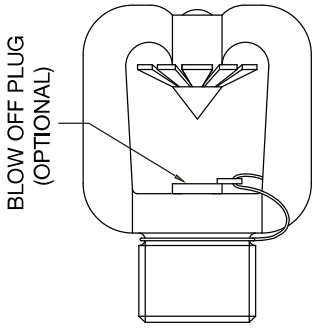
MODEL MV-A, MV-B & MV-E



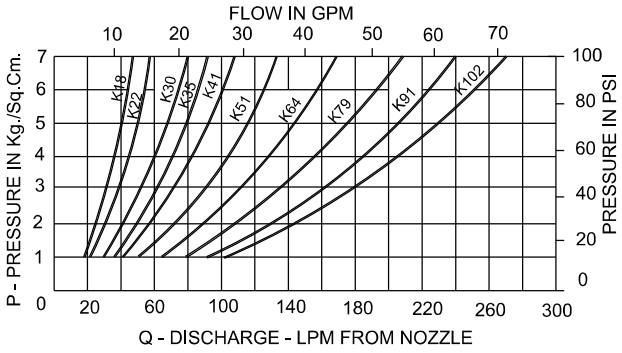
MODEL MV-AS, & MV-BS



NOZZLES WITH BLOW-OFF PLUG



DISCHARGE CHARACTERISTICS



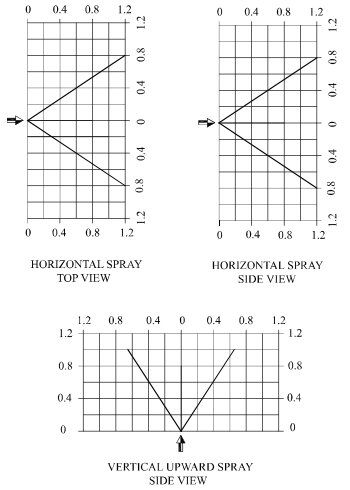
Q =K√P where P is supply pressure in Kg/sq.cm., K= nozzle constant (K-factor) in metric.

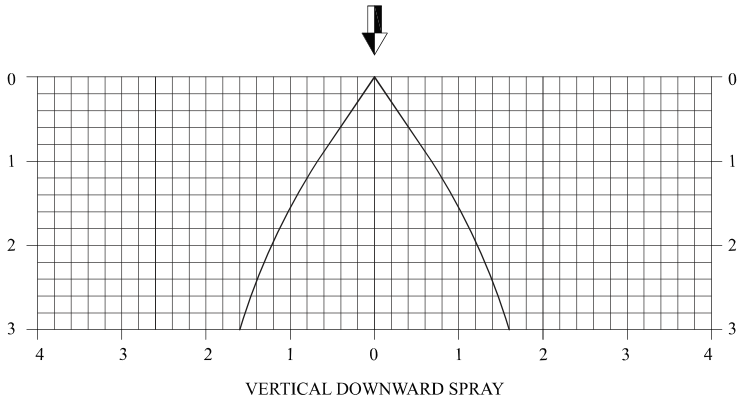
TABLE - I : MATERIAL OF CONSTRUCTION

COMPONENT	MODEL MV-A & MV-AS	MODEL MV-B & MV-BS	MODEL MV-E
Housing	Brass, ASTM B21	Stainless Steel, A351-CF8M	Aluminium Bronze, ASTM-A148
PIN	Brass, ASTM B21	Stainless Steel, A479 GR 31803	Ph.Bronze, B139 / BS2874-PB102
Deflector	Brass, ASTM B21	Stainless Steel, A240 GR 2205	Ph.Bronze BS2870-PB102
Strainer	Copper (For MV-AS)	Stainless Steel 316 (For MV-BS)	---
Blow-Off Plug (Optional)	Elastomer	Elastomer	Elastomer

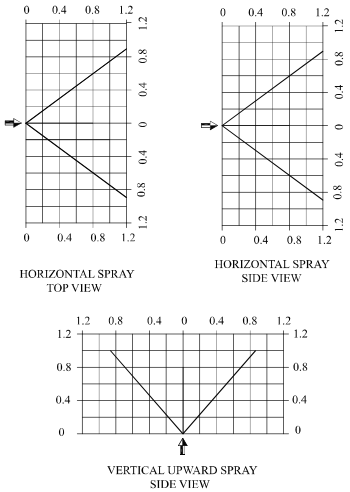
SPRAY PATTERN

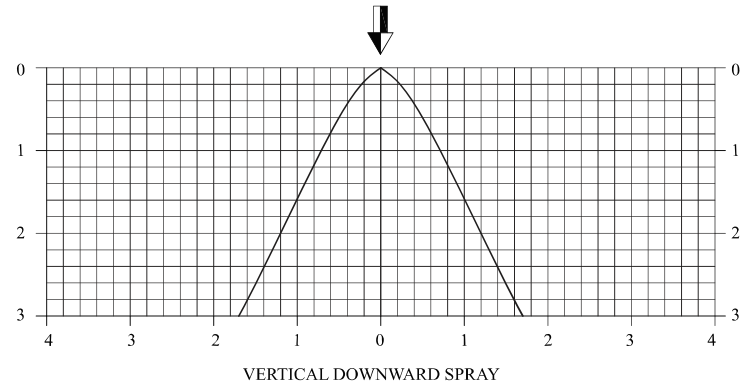
SPRAY ANGLE 65°





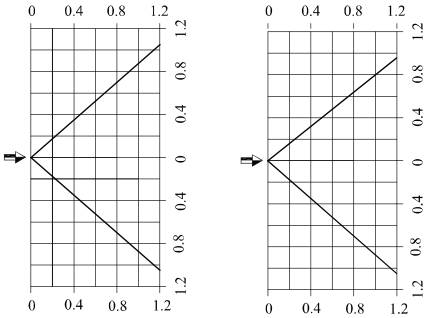
SPRAY ANGLE 80°





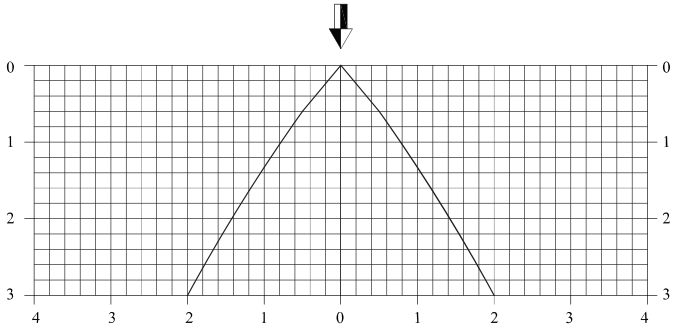
All dimensions are in meters.

SPRAY ANGLE 90°

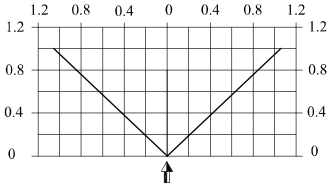


HORIZONTAL SPRAY
TOP VIEW

HORIZONTAL SPRAY
SIDE VIEW

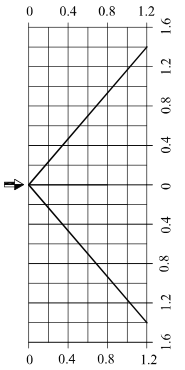


VERTICAL DOWNWARD SPRAY

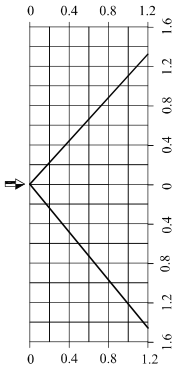


VERTICAL UPWARD SPRAY
SIDE VIEW

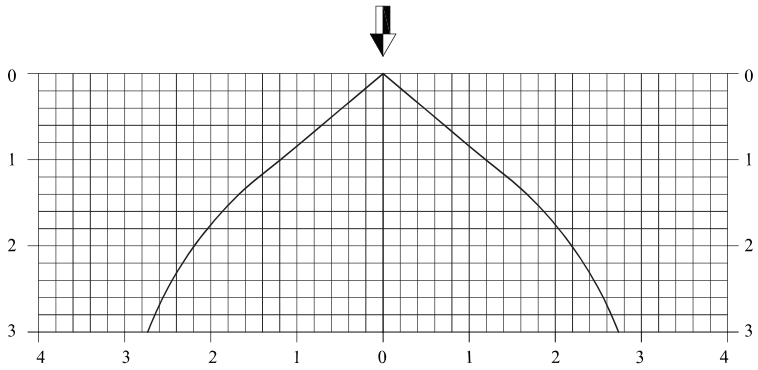
SPRAY ANGLE 100°



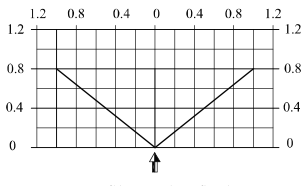
HORIZONTAL SPRAY
TOP VIEW



HORIZONTAL SPRAY
SIDE VIEW



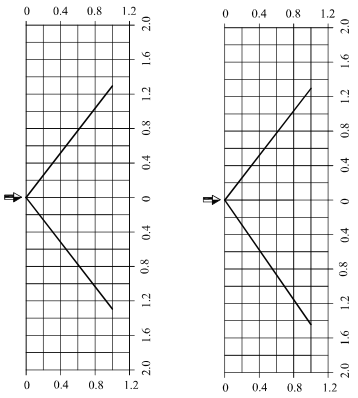
VERTICAL DOWNWARD SPRAY

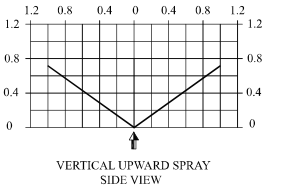


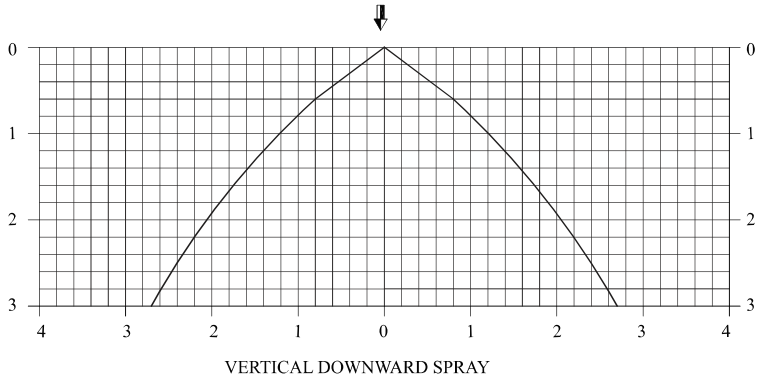
VERTICAL UPWARD SPRAY
SIDE VIEW

All dimensions are in meters.

SPRAY ANGLE 110°

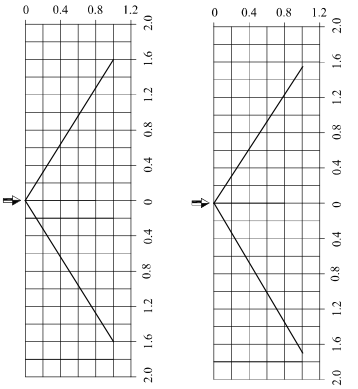


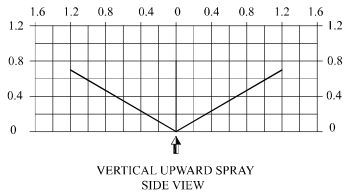


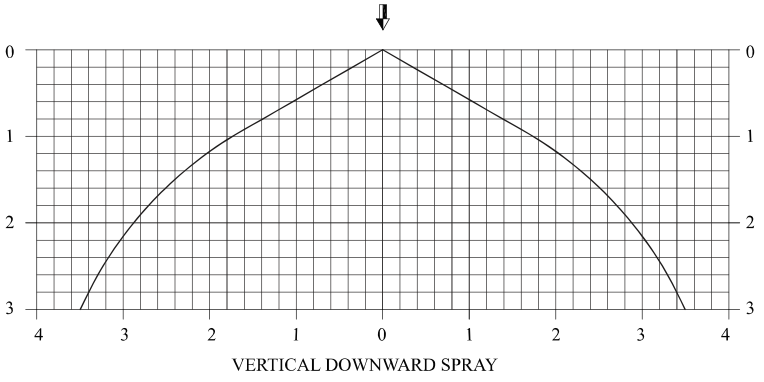


SPRAY ANGLE 120°

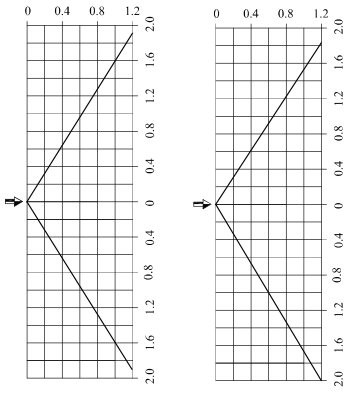
NOZZLE INLET PRESURE - MIN 1.4 KG/SQCM.

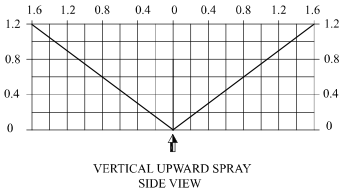


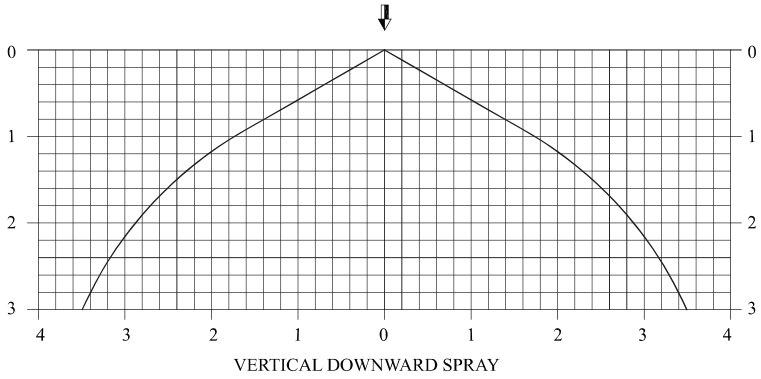




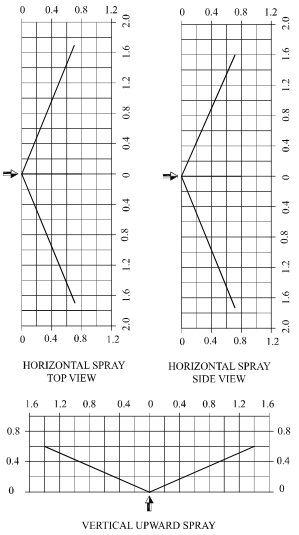
NOZZLE INLET PRESURE - MIN 3.5 KG/SQCM.

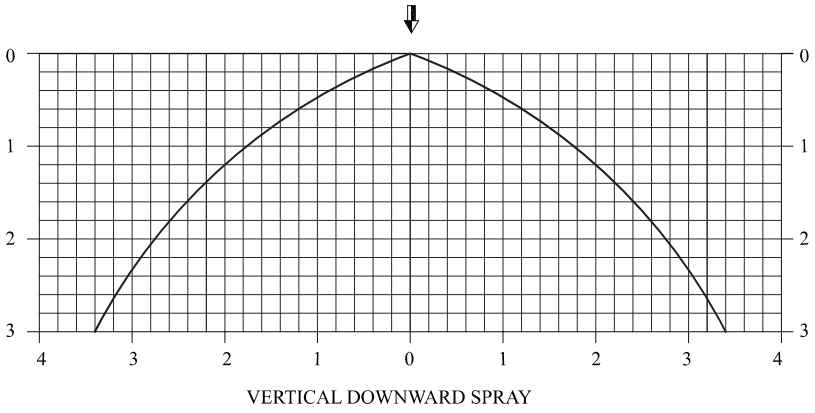






SPRAY ANGLE 130°

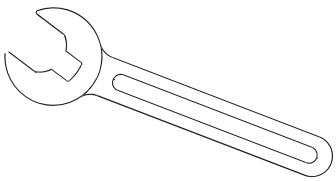




NOTE - DIMENSIONS IN METERS

Note :
1) The design spray pattern given in graph are included spray angle of 65° to 140° at nozzle inlet pressure of 1.4 to 3.5 Bar. When the nozzle pressure above 3.5 is applied, the coverage area will decrease because the spray pattern tends to draw inward at higher pressure.

2) The spray data are obtained from the test in still air.



MV NOZZLE WRENCH

HIGH VELOCITY WATER SPRAY NOZZLE

MODEL: HV-AS & HV-BS

TECHNICAL SPECIFICATION

Maximum Working Pressure	12 Bar (175 Psi)	
Effective Working Pressure	3.5 Bar to 10.5 Bar (50 - 150 Psi)	
Working Pressure	(20 - 50 Psi)	
End Connection	¾" BSPT (¾" NPT Optional)	
Material	HV-AS Housing & Scroll Brass ASTM-B21 Strainer - Copper	
	HV-BS Stainless Steel SS316	
Included Water Spray Angle For Each K-Factor	Spray Angle	K-Factor Metric (US)
	75°	22 (1.54)
	80°	18 (1.26)
	90°	32 (2.24)
	100°	26 (1.82)
	115°	42 (2.94)
	120°	23 (1.61)
Weight (Approx)	0.200 Kg	
Finish	Natural Finish Nickel Chrome Plated (optional for HV-AS	
Ordering Information	Specify Model, K-Factor, Spray Angle and Finish	

DESCRIPTION

High Velocity Water Spray Nozzles are internal swirl plate type open nozzles designed for use in fixed water spray or deluge system for the fire protection application.

These nozzles produce solid uniform and dense core of high velocity water spray to effect fire control. Nozzles are normally used to cool the surface as well as for extinguishment. High Velocity Water Spray Nozzles are typically used for Deluge protection of special hazards such as oil filled transformers, switch-gear, chemical process equipment, conveyor system and flammable liquid storage areas. The minimum desirable pressure to achieve a reasonable spray pattern is 3.5 Kg./sq.cm. (50 psi).

The water distribution pattern is as shown in the graph in following pages giving maximum effective axial distance from the nozzle. The spray pattern shown is with indoor application. The system designer must consider wind velocity while designing the system for outdoor application. Field obstruction if any affecting the spray pattern of the nozzle must be considered. The nozzle may be oriented in any position as deemed necessary to cover the hazard, 3.5 bar to 7 bar pressure at Nozzle is recommended for effective application requiring high velocity water delivery for rapid extinguishment of all fires by emulsification.

The Nozzles are having inbuilt Strainer, but still main pipeline strainer is required in the system.

The Blow-off cap can be used to prevent the depositing of foreign material in the water way of the nozzle. Use of Blow-off cap is optional and not UL listed.

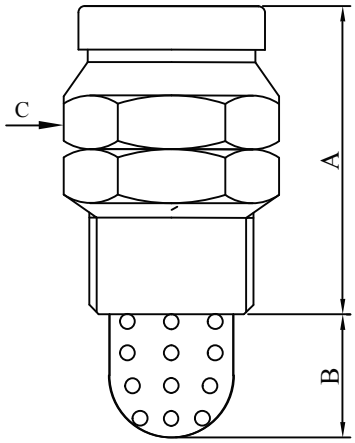
MAINTENANCE

The spray nozzle must be handled with due care. For best results, the storage as well as any further shipment be made in original packing only.

Nozzle which is visibly damaged should not be installed. Use Teflon tape or soft thread sealant on the male thread of the nozzle.

It is recommended that the water spray system be inspected by authorised technical personnel. The nozzle must be checked for corrosion, external and internal obstruction, blockage if any. The nozzle should be cleaned or replaced if required. The system must be operated with optimum water flow at least three times in a year or as per the provision of NFPA/TAC or local authority having jurisdiction. The owner is solely responsible for maintaining the water spray system and components therein, so that it performs properly when required.

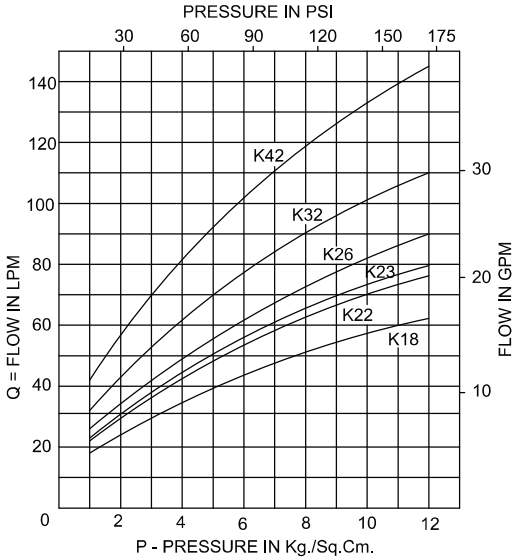
HV-AS



NOZZLE FACTOR & SPRAY ANGLE	A	B	C A/F
K 22 x 75°	49	21	30
K 18 x 80°	44	21	30
K 32 x 90°	49	21	30
K 26 x 100°	55	21	30
K 23 x 120°	49	21	30
K 42 x 115°	49	21	30

DIMENSION In millimeters (Approximate)

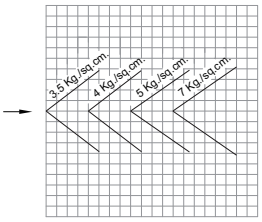
DISCHARGE CHARACTERISTICS



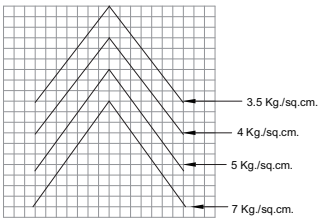
Q =K √ P where P is supply pressure in Kg/sq.cm., K= nozzle constant (K-factor) in metric.

SPRAY PATTERN

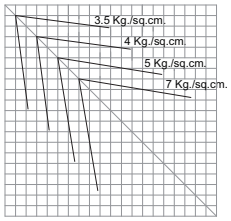
K22 X 75°



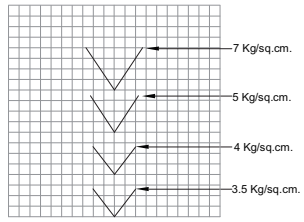
SPRAY HORIZONTAL



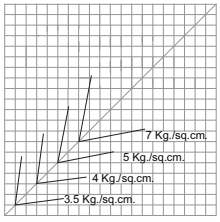
SPRAY VERTICALLY DOWNWARD



SPRAY AT 45° DOWNWARD



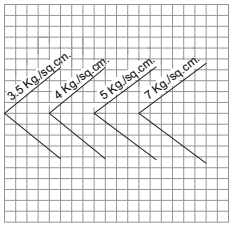
SPRAY VERTICALLY UPWARD



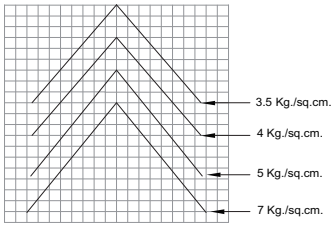
SPRAY AT 45° UPWARD

Note : One square is 200 X 200 mm.

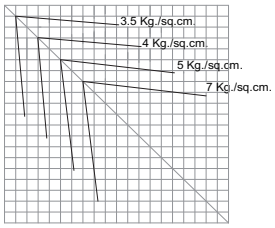
K18 X 80°



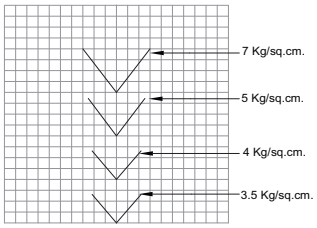
SPRAY HORIZONTAL



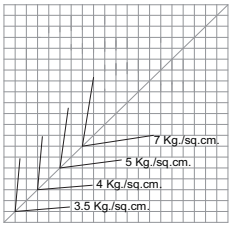
SPRAY VERTICALLY DOWNWARD



SPRAY AT 45° DOWNWARD

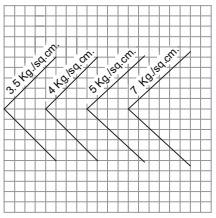


SPRAY VERTICALLY UPWARD

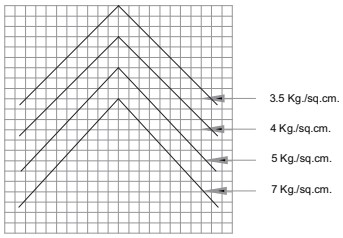


SPRAY AT 45° UPWARD

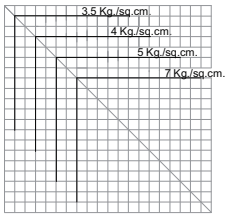
K32 X 90°



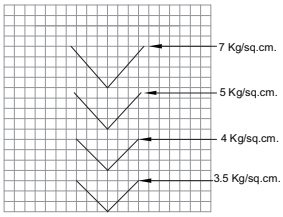
SPRAY HORIZONTAL



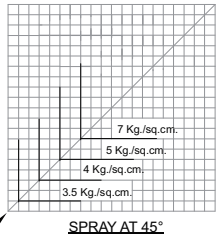
SPRAY VERTICALLY DOWNWARD



SPRAY AT 45° DOWNWARD

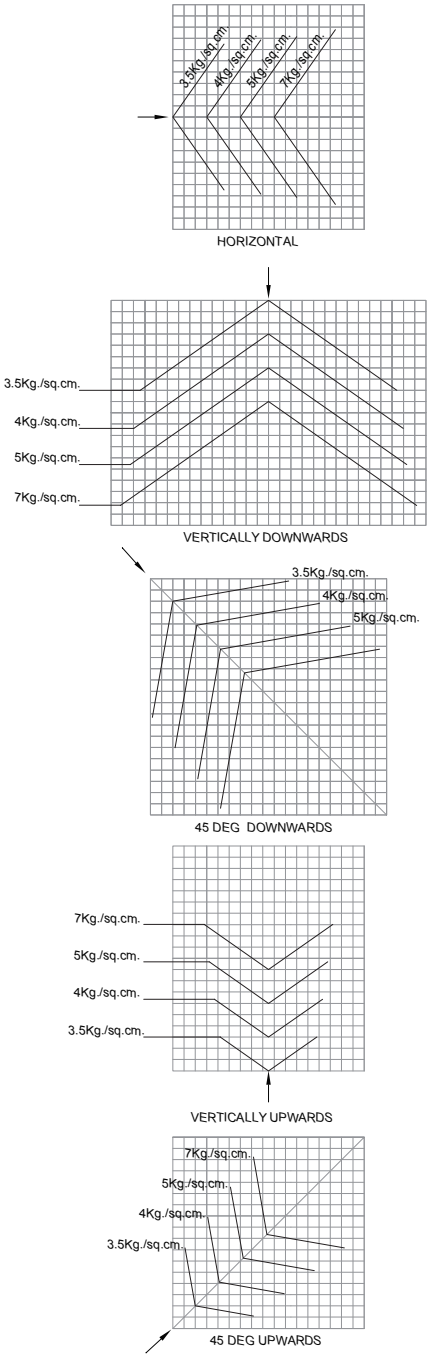


SPRAY VERTICALLY UPWARD

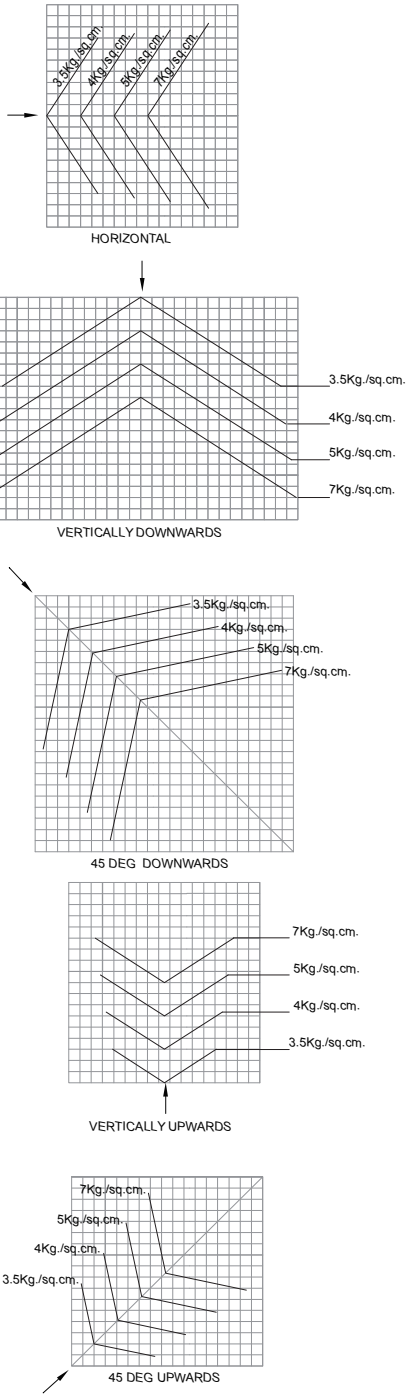


SPRAY AT 45° UPWARD

K42 X 115°

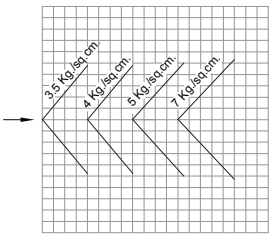


K23 X 120°

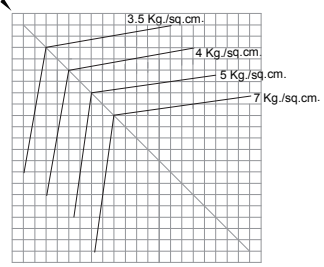


Note : One square is 200 X 200 mm.

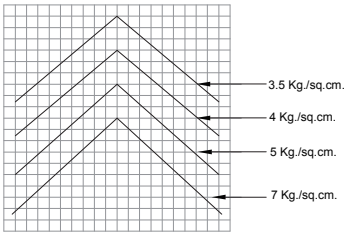
K26 X 100°



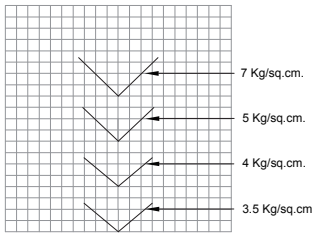
SPRAY HORIZONTAL



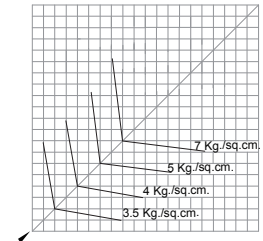
SPRAY AT 45°
DOWN WARD



SPRAY VERTICALLY
DOWN WARD



SPRAY VERTICALLY
UP WARD



SPRAY AT 45°
UP WARD

Note : One square is 200 X 200 mm.

HIGH VELOCITY WATER SPRAY NOZZLE

MODEL: SD-HB Brass
SD-H Stainless Steel

TECHNICAL SPECIFICATION

Maximum Working Pressure	12 Bar (175 Psi)	
Effective Working Pressure	2.1 Bar to 6 Bar (30 - 80 PSI)	
End Connection	1" BSPT (1" NPT Optional)	
Material	SD-HB Housing & Scroll Brass ASTM-B21 Strainer - Copper	
	SD-H SS316 (CF8M) Stainless Steel Housing Strainer - Stainless Steel	
Included Water Spray Angle and K-Factor	Spray Angle	K-Factor Metric (US)
	75°	61 (4.4)
	90°	78 (5.6)
	100°	48 (3.4)
	100°	58 (4.2)
Weight (Approx)	SD-HB 0.25 Kg SD-H 0.22 Kg	
Finish	Brass Finish, Nickel Chrome Plated (optional for SD-HB) Natural (For SD-H)	
Ordering Information	Specify Model, K-Factor, Spray Angle, Finish and Connection	

DESCRIPTION

High Velocity Water Spray Nozzles are internal swirl plate type open nozzles designed for use in fixed water spray or deluge system for the fire protection application.

These nozzles produce solid uniform and dense core of high velocity water spray to affect fire control. Nozzles are normally used to cool the surface as well as for extinguishment. Nozzles are typically used for Deluge protection of special hazards such as oil filled transformers, switch-gear, chemical process equipment, conveyor system, diesel engines, flammable liquid storage areas and similar hazards. The minimum desirable pressure to achieve a reasonable spray pattern is 2.1 Kg./sq.cm. (30 psi). The water distribution pattern is as shown in the graph in following pages giving maximum effective axial distance from the nozzle. The spray pattern shown is with indoor application. The system designer must consider wind velocity while designing the system for outdoor application. The spray pattern is drawn considering maximum of 20 Km/hr. Field obstruction if any affecting the spray pattern of the nozzle must be considered. The nozzle may be oriented in any position as deemed necessary to cover the hazard.

2.1 bar to 6 bar pressure at Nozzle is recommended for effective application requiring High Velocity Water delivery for rapid extinguishment of all fires by emulsification.

The Nozzles are having inbuilt Strainer, but still main pipeline strainer is required in the system.

The Blow-off cap can be used to prevent the depositing of foreign material in the water way of the nozzle. Use of Blow-off cap is optional and not UL listed.

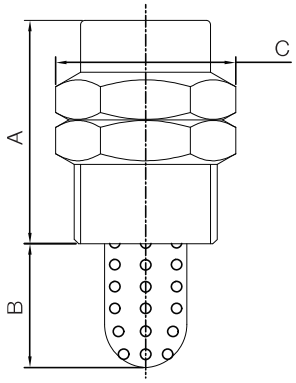
MAINTENANCE

The spray nozzle must be handled with due care. For best results , the storage as well as any further shipment be made in original packing only.

Nozzle which is visibly damaged should not be installed. Use Teflon tape or soft thread sealant on the male thread of the nozzle.

It is recommended that the water spray system be inspected by authorised technical personnel. The nozzle must be checked for corrosion, external and internal obstruction, blockage if any. The nozzle should be cleaned or replaced if required. The system must be operated with optimum water flow at least three times in a year or as per the provision of NFPA/TAC or local authority having jurisdiction.

The owner is solely responsible for maintaining the water spray system and components therein, so that it performs properly when required.



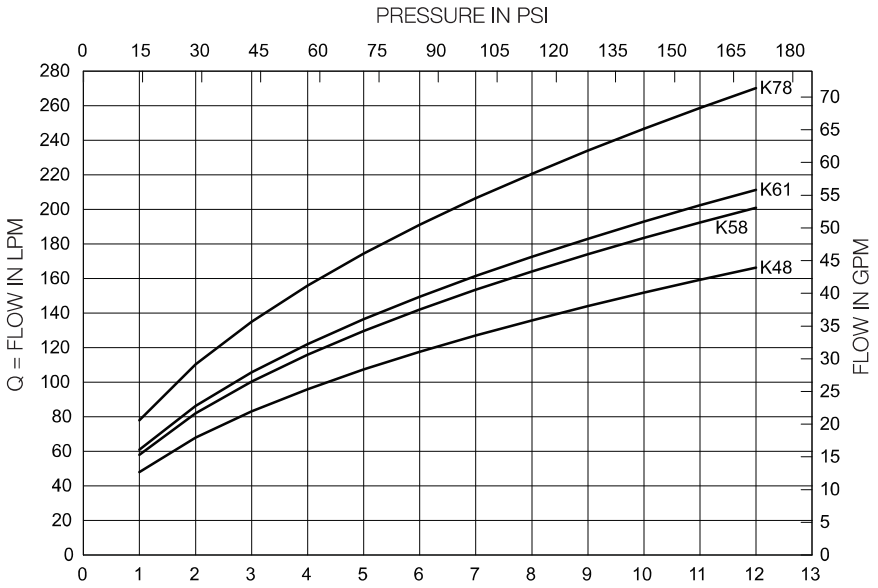
MATERIAL

PART	SD-HB	SD-H
Body	Brass	Stainless Steel
Swirl Plate	Brass	SS 316
Strainer	Copper	SS 316

NOZZLE FACTOR & SPRAY ANGLE	A	B	C A/F
K 48 x 100°	52	29	36
K 58 x 100°	52	29	36
K 61 x 75°	52	29	36
K 78 x 90°	52	29	36

DIMENSION In millimeters (Approximate)

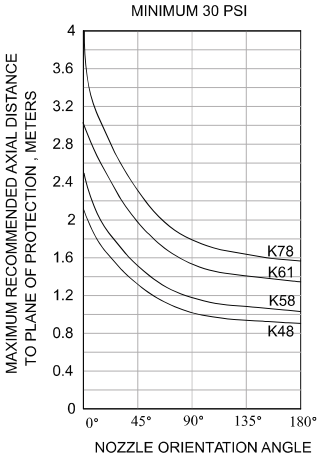
DISCHARGE CHARACTRESTICS

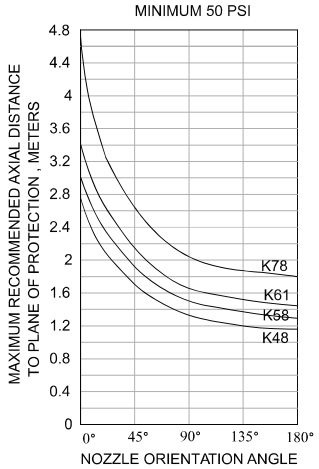


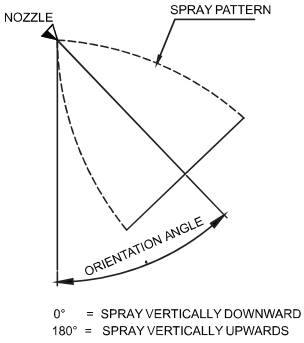
P - PRESSURE IN Kg./Sq.Cm.

Q = K √ P where P is supply pressure in Kg/sq.cm., K = nozzle constant (K-factor) in metric
US K factor = Metric K factor ÷ 14.2745

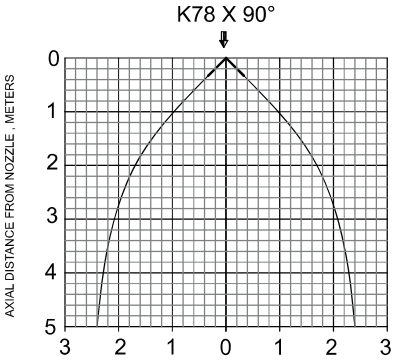
MAXIMUM RECOMMENDED AXIAL DISTANCE VS NOZZLE ORIENTATION

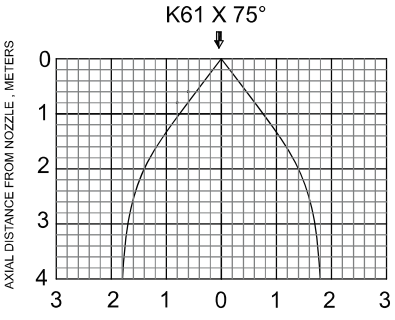


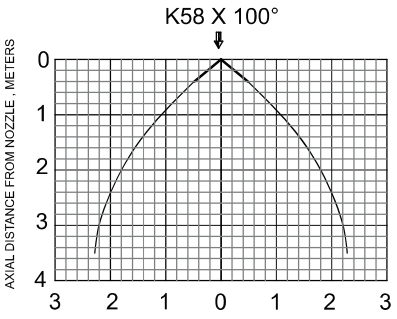


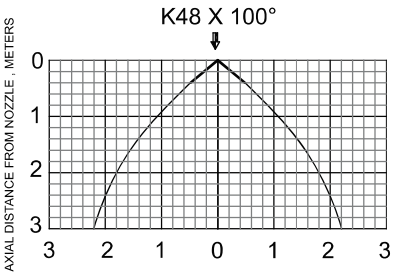


SPRAY PATTERN









REVERSE ACTION WATER SPRAY NOZZLE

MODEL: MV-CB, MV-CBS, MV-C, MV-CS, MV-CE

TECHNICAL SPECIFICATION

Model	**MV CB** - Brass, **MV CBS** - Brass with Copper Strainer **MV C** - Stainless Steel **MV CS** - Stainless Steel with Strainer **MV CE** - Aluminium Bronze
Maximum Working Pressure	12.3 kg/cm^2 (175 PSI)
Effective Working Pressure	1.4 to 3.5 kg/cm^2 (20 - 50 PSI)
End Connection	½" BSPT (½" NPT Optional)
Included Water Spray Angle For Each K-Factor	140°, 120°
K Factor	**MV-CB/MV-C MV-CE** K30 (2.1) K51 (3.5) K64 (4.35) K79 (5.45) K102 (6.75) **MV-CBS MV-CS** K18 (1.3) K22 (1.5)
Weight (Approx)	0.130 Kg
Finish	**MV-CB/ MV-CBS:** Natural Brass finish, Chrome plated brass, Electroless Nickel plated, Epoxy coated **MV-C/ MV-CS/ MV-CE:** Natural finish
Ordering Information	Specify Model, K-Factor, Spray Angle, Finish and Connection

DESCRIPTION

SHIELD Reverse Action Medium Velocity Water Spray Nozzles are open type (non-automatic) nozzles, designed for directional spray application in fixed fire protection system. Reverse Action MV nozzle has external deflector and discharges water in opposite direction of flow. Water is uniformly distributed over the surface to be protected. The Nozzles are effectively designed to apply water to exposed vertical, horizontal, curved and irregular shaped surfaces to allow cooling to prevent excessive absorption of heat from an external fire and provide structural damage or spread of fire. In some application, nozzles may be applied to control or extinguish the fire depending on water design density as per applicable codes. The nozzle is used in deluge water spray system for special hazard fire protection application. As the design and intent of specific water spray system may vary considerably, the nozzle is made available in several combinations of orifice sizes and spray angles.

The minimum desirable pressure to achieve a reasonable spray pattern is 1.4 Kg./Sq.cm. The water distribution pattern as shown in the graph in following pages is at an average pressure of 2.0 Kg/Sq.cm. The change in pressure between 1.4 to 3.5 Kg./sq.cm. does not affect considerable change in spray angle. The spray pattern shown is considering still air condition. System designer must consider wind velocity while designing the system for outdoor application. Field obstruction if any affecting the spray pattern of the nozzle must also be considered. The nozzle may be oriented to any position as deemed necessary to cover the hazard.

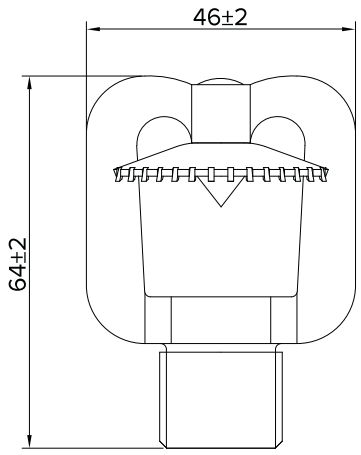
The Blow-off plugs can be used to prevent depositing of foreign materials in the water way of the nozzle, which could interfere with the discharge of the spray nozzle. Blow-off plugs are optional and are not UL listed. As per NFPA-15 main pipeline strainer is required for system utilizing nozzle office diameter less than 9.5mm (⅜ inch), i.e Nozzle having K-factor 30 and less, and also for the system water which is likely to contain obstructive materials.

INSTALLATION & MAINTENANCE

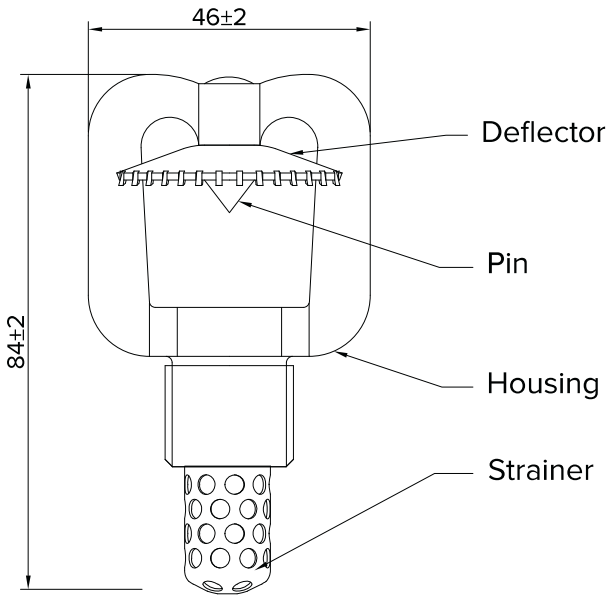
The spray nozzle must be handled with due care. For best results, the storage as well as any further shipment be made in original packing only. Nozzle which is visibly damaged should not be installed. Use Teflon tape or soft thread sealant on male thread of the nozzle. The nozzles must be hand tightened into the fitting. Excessive tightening torque may result into serious damage to nozzle arms and the deflector, which may affect spray pattern of the nozzle and its performance.

It is recommended that water spray system be inspected regularly by authorized technical personnel. The nozzle must be checked for atmospheric effects, external and internal obstruction & blockage if any. The system must be operated with optimum water flow at least twice in a year or as per the provisions of NFPA /TAC or local authority having jurisdiction. The owner is solely responsible for maintaining the water spray system and the components there in, so that it performs properly when required.

MODEL MV-CB, MV-C, MV-CE



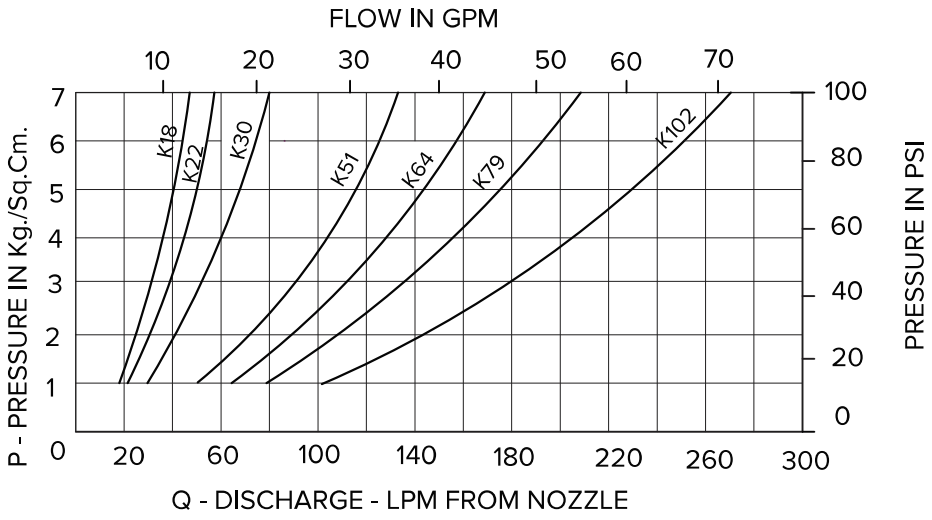
MODEL MV-CBS, MV-CS



MATERIAL OF CONSTRUCTION

COMPONENT	MODEL MV-CB & MV-CBS	MODEL MV-C & MV-CS	MODEL MV-CE
Housing	Brass, ASTM B21	Stainless Steel, A351-CF8M	Aluminium Bronze, ASTM-A148
Pin	Brass, ASTM B21	Stainless Steel, A479 GR 31803	Ph.Bronze, ASTM B148 / BS2874-PB102
Deflector	Brass, ASTM B21	Stainless Steel, A240 GR 2205	Ph.Bronze, ASTM B148 / BS2874-PB102
Strainer	Copper (For MV-CBS)	Stainless Steel 316 (For MV-CS)	---
Blow-Off Cap	Elastomer	Elastomer	Elastomer

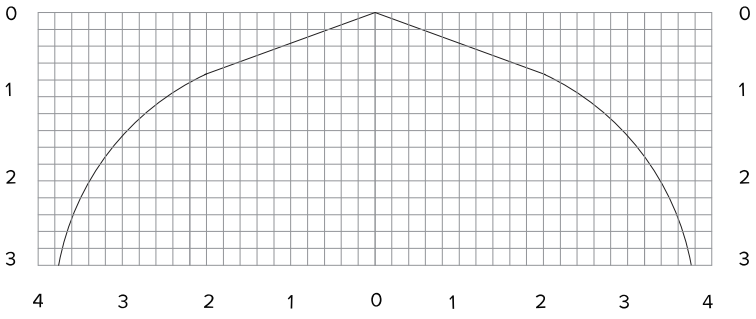
DISCHARGE CHARACTERISTICS



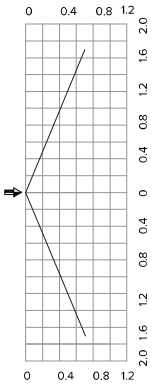
Q =K √ P where P is supply pressure in Kg/sq.cm., K= nozzle constant (K-factor) in metric.

SPRAY PATTERN

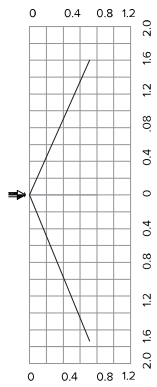
SPRAY ANGLE 140°



VERTICAL DOWNWARD SPRAY

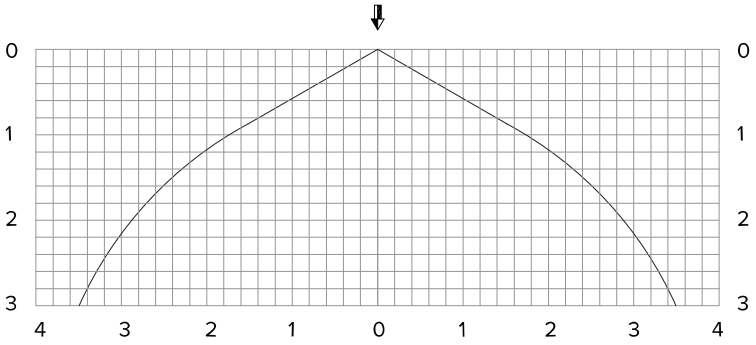


HORIZONTAL SPRAY TOP VIEW

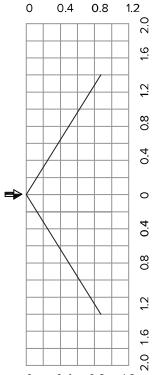


HORIZONTAL SPRAY SIDE VIEW

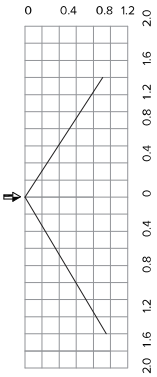
SPRAY ANGLE 120°



VERTICAL DOWNWARD SPRAY



HORIZONTAL SPRAY TOP VIEW



HORIZONTAL SPRAY SIDE VIEW

Note :

1. All dimensions are in meters
2. The design spray pattern given in graph are included spray angle of 120 Deg. and 140 Deg. at nozzle inlet pressure of 1.4 to 3.5 Bar. When the nozzle pressure above 3.5 is applied, the coverage area will decrease because the spray pattern tends to draw inward at higher pressure.
3. The spray data are obtained from the test in still air.