FOAM DISCHARGE DEVICES

First and only local manufacturer having **FM Certificate** in TÜRKİYE

- Foam Chamber
- Foam Maker
- Foam Pourer
- Foam Sprinker

FM APPROVED

Certificate of Compliance

This certificate is issued for the following:

Low Expansion Foam Systems
For Use with HD AFFF 3F-C6 and HD AR-AFFF 3x3-C6 Aqueous Film-Forming Foam Concentrates

Fire Protection Monitor Assemblies
Models: 3A WM1C, 3A WM2S, 3A WM3C, 3A WM4B

Firefighting Nozzles for use with Monitor Assemblies
Models: Model 3A MN1, Model 3A MN2

Prepared for:

3A Köpüklü Yangın Korunum Sistemleri San. ve Tic. Ltd. Şti.
Kultur Mahallesi, Efil Sokak No:2/414
Tatvan, Bitlis 13200
Turkiye

FM Approvals Class: 5130, 1421, 5511

Approval Identification: PR461429 Approval Granted: 28 June 2024

To verify the availability of the Approved product, please refer to www.approvalguide.com

Said Approval is subject to satisfactory field performance, continuing Surveillance Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.

FM Approvals®
Member of the FM Global Group

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SCC Accredited CB-PS OCPS Accredité CCN

Önsöz

3A Köpüklü Yangın Korunum Sistemleri San. ve Tic. Ltd. Şti. *2024 yılında kuruldu. Kuruluş amacımız yangın sektöründe özellikle endüstriyel tesislerin korunması konusunda çalışmaktır.*

Temel amacımız, endüstriyel yangın tehlikelerine doğru ve akılcı çözümler üretmektir. Endüstriyel yangın tehlikelerine uygun çözümler üretirken, ulusal ve uluslararası kuralları uygulayarak bu kuralların gerektirdiği kalitede ve onaylara sahip ürünleri kullanarak çözüm üretmektir.

Temel hedefimiz sorun değil çözüm üretmektir. Bu yönü ile 3A Yangın, yetişmiş kadrosu, yurt dışı çözüm ortakları ve özel çözüm yöntemleri ile sektördeki yerini almıştır. Deneyimli kadrosu ile kendi içinde iş bölümü yapmış olup, malzeme satışı, sistem dizaynı ve projelendirme, taahhüt, teknik servis hizmetlerini farklı departmanları ile vermektedir.

3A Köpüklü Yangın Korunum Sistemleri San. ve Tic. Ltd. Şti. *Müşteri memnuniyetini, sürekli gelişmeyi, kaliteyi, ekip çalışmasını, sosyal sorumluluğu, profesyonel yönetim anlayışını, teknolojik gelişmelere uygunluğu ve paylaşımı esas alan bir anlayışla sektöründe lider bir kuruluş olmayı kendine "Vizyon" edinmiştir.*

Ayrıca belirlemiş olduğumuz bu vizyon çerçevesinde müşterilerimize, çalışanlarımıza, ülkemize kaynak ve değer yaratan örnek bir kuruluş olmayı kendimize "Misyon" edindik.

MODEL - 3A FCC & 3A FCS

FOAM CHAMBER TECHNICAL DATA		
MODELS	3A FCC-65 3A FCC-80 3A FCC-100 3A FCC-150	Carbon Steel Construction
	3A FCS-65 3A FCS-80 3A FCS-100 3A FCS-150	Stainless Steel Construction
INLET SIZE	65, 80, 100 NB & 150 NB	
WORKING PRESSURE	Min. 2.8 kg/sq.cm (40 psi) Max. 7 kg/sq.cm (100 psi)	
FLANGE CONNECTION	ANSI B16.5 Class 150#SORF	
WEIGHT (Approx.)	65 NB - 34.5 kg 80 NB - 49.5 kg 100 NB - 72.0 kg 150 NB - 110.0 kg	
VAPOUR SEAL RUPTURE PRESSURE	0.7 to 1.75 kg/sq.cm (10 psi to 25 psi) Running water/ water foam solution pressure at inlet of Foam Chamber	
MAXIMUM PERMISSIBLE BACK PRESSURE ON VAPOUR SEAL	0.07 kg/sq.cm (1.0 psi)	
VAPOUR SEAL	Glass standard supply, Graphite optional only with FM Approvals	
DEFLECTOR	Solid or Split Deflector	
FINISH	Red RAL 3001 standard supply Other shades optional	
APPROVAL	FM Approved	
ORDERING INFORMATION	a) Model & Size b) Flow & Pressure at inlet of each Foam Chamber c) Inlet, outlet flange specification d) Type of Deflector e) Type of Foam concentrate used f) Tank number / Tag number	

FEATURES

- FM Approved
- Heavy duty welded construction with choice of Carbon Steel or Stainless Steel material
- Frangible Glass Vapour Seal
- Controlled Air Flow proportional to liquid flow for optimum foam quality and rupture of vapour seal in narrow pressure tolerances for increased reliability
- Field replaceable orifice plate fitted with Foam Chamber

APPLICATION

Foam Chamber is used in one of the most common applications to protect vertical fixed roof (cone) liquid storage tanks, with or without internal floating roof with the low expansion foam system. The application of foam is on the basis that the risk comprises the total surface area of the fuel. The foam system design guidelines generally used are in accordance with NFPA-11 standard.

Foam Chambers are defined by NFPA-11 as Type II discharge outlets for delivering foam to the surface of a flammable liquid. Foam Chambers are widely used with the Balance Pressure Foam Proportioning System, Bladder Tank Proportioner or Foam Tender.

SPECIFICATION

Foam Chamber is an air aspirating foam discharge device, covering wide range of flow from 75 to 3300 litres per minute at 2.8 to 7 kg/sq.cm. inlet pressure. The Foam Chamber contains a vapour seal to prevent the entry of fuel vapour into the foam chamber and the foam solution pipe. Each foam chamber is supplied with an orifice plate, designed for the required flow and inlet pressure. The orifice is field replaceable in the event of change in design parameters.

Foam is produced by introducing air into the foam solution stream. The inlet of foam chamber is designed to create venturi jet which draws air into the foam solution stream. Air is drawn into the foam solution through the holes located on the foam chamber covered with stainless steel screen to exclude nesting birds and insects. The aerated foam is directed into the deflector for the gentle application of the expanded foam. The deflectors are available in different models.

Removal of cover plate from the top of the chamber allows the system to be tested and a sample of the expanded foam can be collected without removing the vapour seal or disconnecting the foam chamber from the tank. Frangible glass bursting disc/graphite (vapour seal) can be replaced easily.

The vapour seal is designed to rupture within 0.7 to 1.75 kg/sq.cm (10 to 25 psi) pressure at inlet flange of Foam Chamber, as required by NFPA, FM standard. The vapour seal will withstand maximum back pressure of 0.07 kg/sq.cm (1.0 psi) or equal to 686 mm of water column as specified by API for welded storage tank. If the requirement exceeds 0.07 kg/sq.cm (1.0 psi) as in case of nitrogen blanketing system, then this equipment may not be suitable.

The vapour seal is frangible glass. Vapour seal is supplied with holder and for spares it can be with or without holder. The 'O' ring used for seal are Nitrile Rubber and optional Viton is recomended for polar solvent.

SYSTEM DESIGN REQUIREMENT

The NFPA-11, a standard for low expansion foam, provides the essential requirements of an appropriate designed foam pouring system, these are identified and outlined as below:

The Foam Deflector is used with the Foam Chamber.

The aerated foam from the Foam Chamber is directed in to the deflector for the gentle application of the expanded foam. The deflector reduces the expanded foam velocity and allows the foam to slide down the tank wall.

(a) Number of Foam Chamber:

The number of foam chambers required is determined by tank diameter. Where two or more foam chambers are required, they shall be spaced equally around the tank periphery and each Foam Chamber shall be sized to deliver foam at an approximately same rate. Please refer graph to select unit that will provide required minimum foam solution application rate at the available operating pressure of the Foam Chamber.

For minimum number of Foam Chamber requirement, kindly follow the recommendations as per NFPA/OISD or as per the governmental codes or ordinances wherever applicable.

(b) Minimum Foam Solution Application Rate:

The minimum foam solution application rate is the rate at which the water and foam concentrate in correctly proportioned ratio should be delivered to the surface of a storage tank under protection to control and extinguish the fire.

For minimum application rate requirement, follow the recommendations as per NFPA/OISD or governmental codes or ordinances wherever applicable.

TESTING & MAINTENANCE

Carefully unpack Foam Chamber. While unpacking and installation it is to be handled with care and shocks to be avoided. Check visually for any damages. While installing ensure that Foam Chamber is not under stress due to any misalignments in installation or variations of system piping. Ensure that the strainer assembly is clear from any blockages or damages. If strainer assembly is either blocked or damaged, it will adversely affect the performance of the equipment.

Qualified and trained person must commission the system. After few initial successful tests, an authorized person must be trained to perform inspection and testing of the system.

It is recommended to carry out physical inspection of the system regularly. The system must be fully tested at least once in a year or in accordance with applicable NFPA/OISD standards or in accordance with authority having local jurisdiction.

Do not turn off the system or any valve to make repair or test the system, without placing a roving Fire Patrol in the area covered by the system. The Patrol should continue until the system is put back in service. Also inform the local security guard and control alarm station, so as to avoid false alarm.

Each system is to be flushed properly. The vapour seal must be replaced if the system has been operated.

Normal testing of the chamber can be carried out by removing the cover plate from the top of the chamber. This allows the system to draw a sample of the expanded foam without removing the vapour seal or disconnecting the Foam Chamber from the tank.

The air screen is to be inspected periodically for the obstruction of air inlet holes. If any obstruction is noticed, remove the same and flush if necessary.

It is recommended to have regular maintenance programme to inspect the Vapour Seal Chamber discharge area and deflector for possible deposit or obstruction.

The owner is responsible for the testing, inspection & maintenance of the Foam Chamber.

CAUTION

Do not install Foam chambers on pressured storage tanks (Inert gas blanketed tanks) and storage tanks containing products, which may attack the foam chamber standard construction material.

Maximum permissible back pressure on vapour seal is 0.07 kg/sq.cm (1.0 psi)

NOTE:

1. A provision is to be made for pressure gauge mounting at inlet of foam chamber, which may be plugged after successful commissioning of the system. This provision will help to analyse the system while commissioning.
2. FM approval of equipment are valid only when used with HD foam concentrate in a manner as listed and as per FM approval data.
3. FM approval is valid only when total system is having fm approved product.
4. Refer to the individual foam FM approval, for limitation with each foam concentrate and foam chamber.

Selection of 3A Foam Chamber:

TABLE-1 gives the K-Factor of Foam Chamber at various pressures for selection of correct size of Foam Chamber. FM Approvals have different Flow/K-factors.

TABLE-I

APPROVALS	FM APPROVED	
FOAM CONCENTRATE	**AFFF 3%**	**AR-AFFF 3X3%**
WORKING PRESSURE	2.8 To 7 kg/sq.cm	3.5 To 7 kg/sq.cm
MODELS	**K-FACTOR**	
3A FCC 65 & 3A FCS 65	92.6 To 200.6	84.5 To 217.4
3A FCC 80 & 3A FCS 80	184 To 429	167.8 To 396
3A FCC 100 & 3A FCS 100	370.5 To 960	320.7 To 952.5
3A FCC 150 & 3A FCS 150	884.5 To 1247.3	783 To 1247.4

To select the size of the Foam Chamber use the following formula:

$Q = K \sqrt{P}$

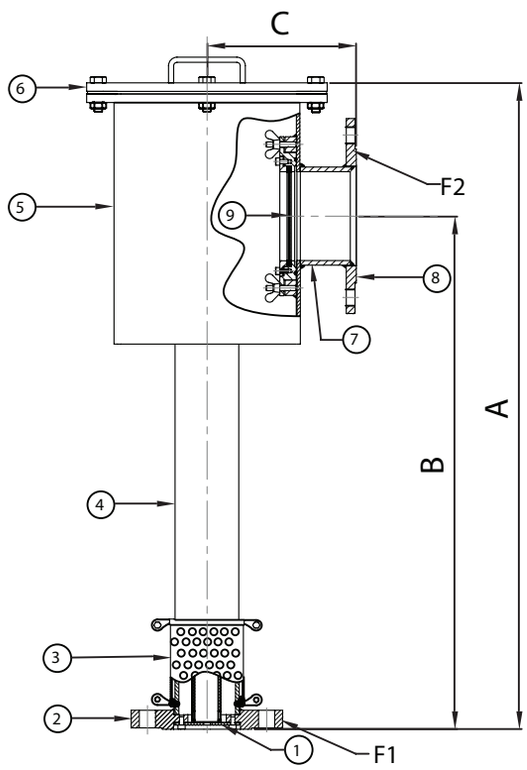
Q = Total solution flow in litres per minute

K = Constant for Foam Chamber

P = Inlet pressure in kg/sq.cm.

FOAM CHAMBER

MODEL	INLET SIZE	OUTLET SIZE	DIMENSIONS in millimeter (Approximate)		
	F1	F2	A	B	C
3A FCC 65 & 3A FCS 65	65NB	100NB	756	600	175
3A FCC 80 & 3A FCS 80	80NB	150NB	1093	908	225
3A FCC 100 & 3A FCS 100	100NB	200NB	1221	996	275
3A FCC 150 & 3A FCS 150	150NB	250NB	1250	1018	325



PART LIST

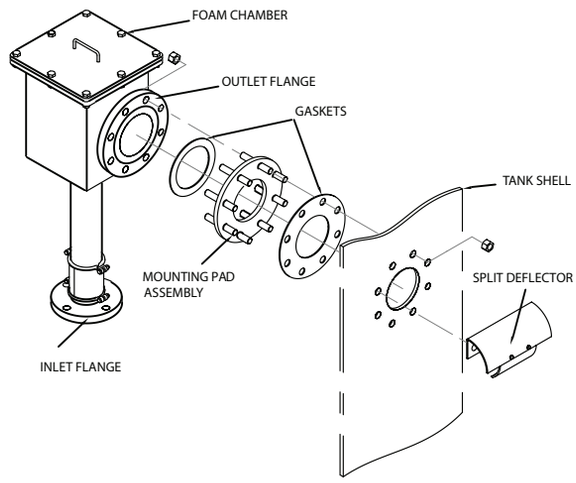
ITEM NO.	DESCRIPTION	MATERIAL SPECIFICATON	
		3A FCC	3A FCS
1	ORIFICE ASSEMBLY	STAINLESS STEEL	STAINLESS STEEL
2	INLET FLANGE	STEEL	STAINLESS STEEL
3	STRAINER ASSEMBLY	STAINLESS STEEL	STAINLESS STEEL
4	FOAM MAKING CHAMBER	STEEL	STAINLESS STEEL
5	FOAM CHAMBER	STEEL	STAINLESS STEEL
6	INSPECTION COVER	STEEL	STAINLESS STEEL
7	DISCHARGE PIPE	STEEL	STAINLESS STEEL
8	OUTLET FLANGE	STEEL	STAINLESS STEEL
9	VAPOUR SEAL ASSEMBLY	GLASS	GLASS

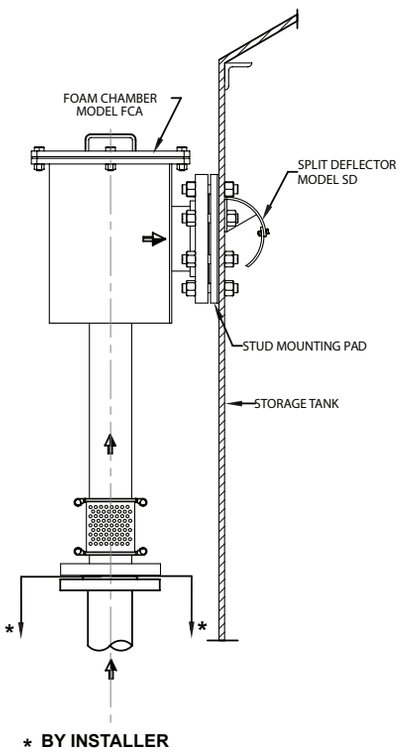
NOTE:

1. Strainer Assembly consists of SS perforated sheet, SS Strainer holder & Galvanised Nut/Bolt.
2. Vapour Seal is Glass as standard supply FM Approved & Graphite disc is optional only for FM Approved
3. Pipes used are ERW (Seamless Pipes are optional)
4. Foam chambers are open to atmosphere & do not have internal shutoff device,hence no hydrotest is offered during inspection.

TYPICAL FOAM CHAMBER INSTALLATION WITH DEFLECTOR

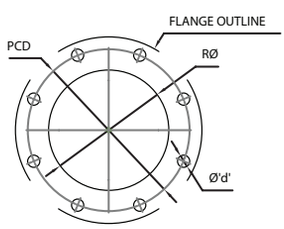
TYPICAL INSTALLATION OF FOAM CHAMBER WITH STUD MOUNTING PAD AND SPLIT DEFLECTOR





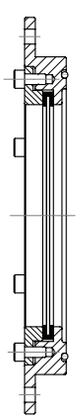
NOTE: Stud Mounting Pad with gasket & split deflector are optional items. To be ordered separately.

TANK CUTOUT FOR MOUNTING OF SPLIT DEFLECTOR

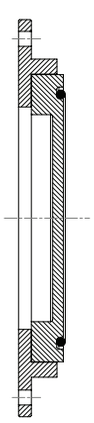


FOAM CHAMBER SIZE			CUTOUT SIZE			
TYPE	INLET FLANGE SIZE	OUTLET FLANGE SIZE	RØ	PCD	HOLE Ø'd'	NO OF HOLES
FCC 65	65	100	116	190.5	19	8
FCC 80	80	150	170	241	22	8
FCC 100	100	200	221	298	22	8
FCC 150	150	250	276	362	25	12

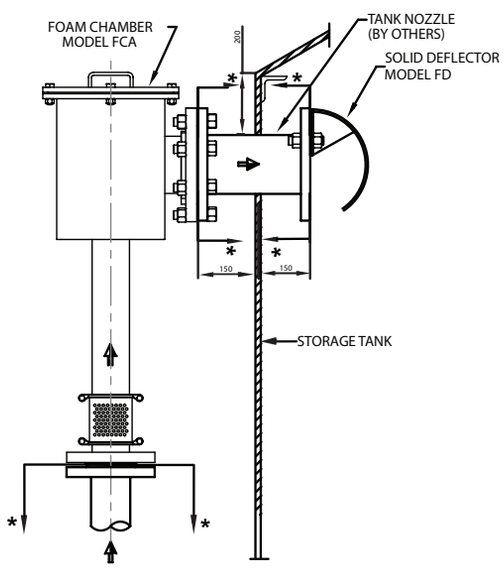
TYPICAL INSTALLATION OF FOAM CHAMBER WITH STUD FLANGED TANK NOZZLE AND SOLID DEFLECTOR



GLASS VAPOUR SEAL WITH HOLDER (STANDARD SUPPLY)



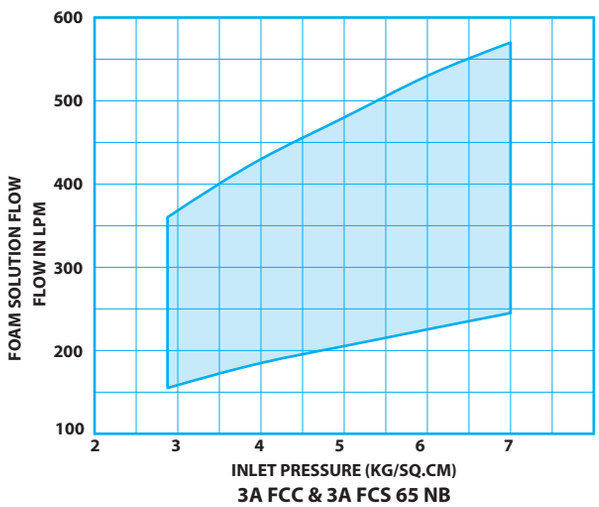
GRAPHITE VAPOUR SEAL WITH HOLDER, (OPTIONAL SUPPLY ONLY WITH FM APPROVAL)



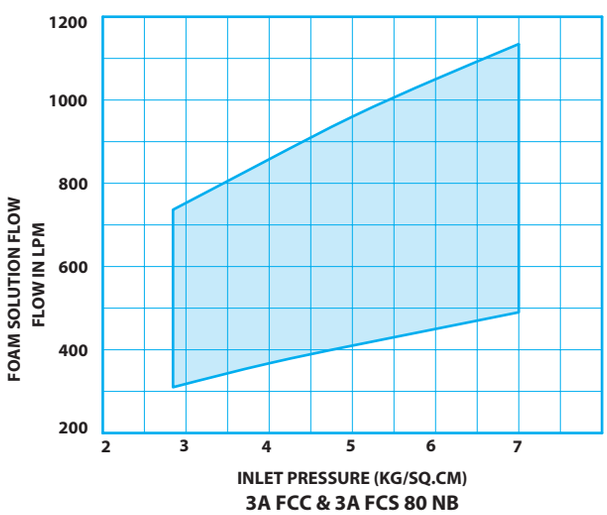
NOTE:

1. Above dimensions are general guidelines only. The system designer can adopt the dimensions as per NFPA/TAC/OISD or as per the governing rules & ordinance having local jurisdiction.
2. Tank nozzle, nut-bolts & gaskets are optional, to be ordered separately.
3. Split deflector Model SD and solid deflector Model FD is standard supply in carbon steel material and optional in stainless steel.

PRESSURE VS FLOW PERFORMANCE CHARACTERISTIC
FM APPROVED WITH FOAM CONCENTRATE AFFF 3%



3A FCC & 3A FCS 65 NB



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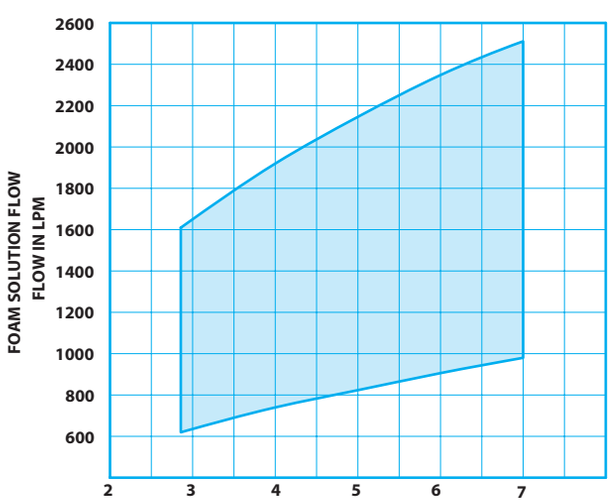

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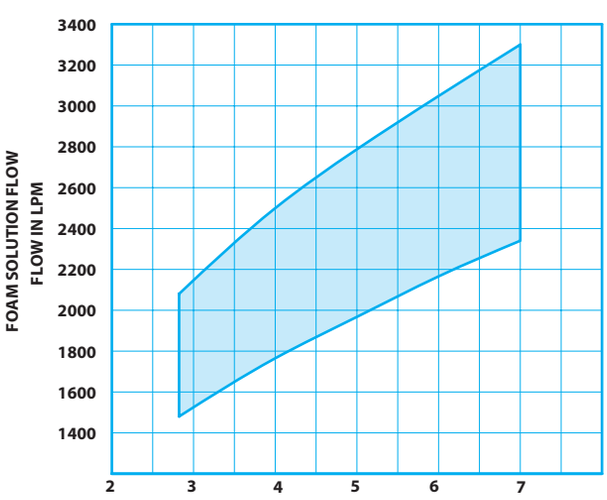
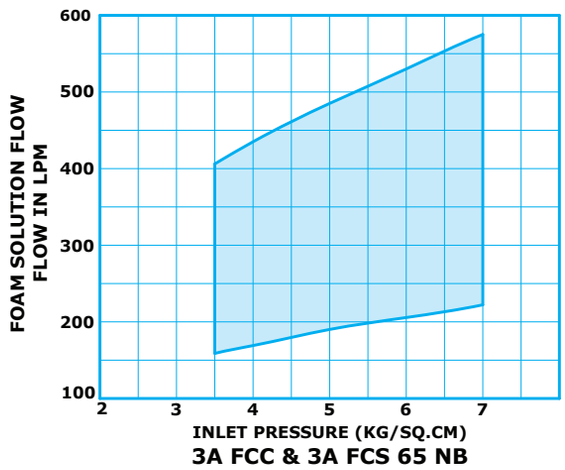
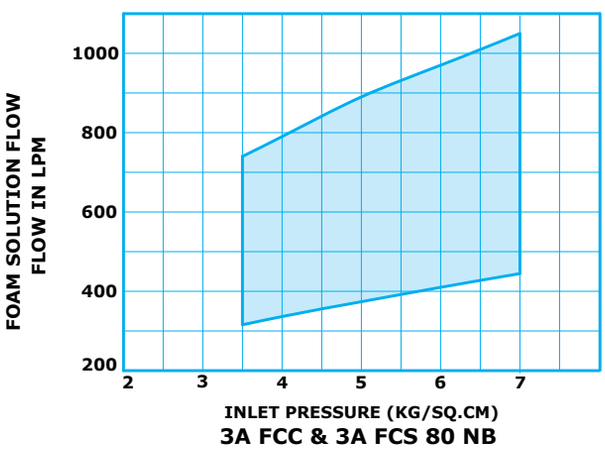


3A FCC & 3A FCS 150 NB

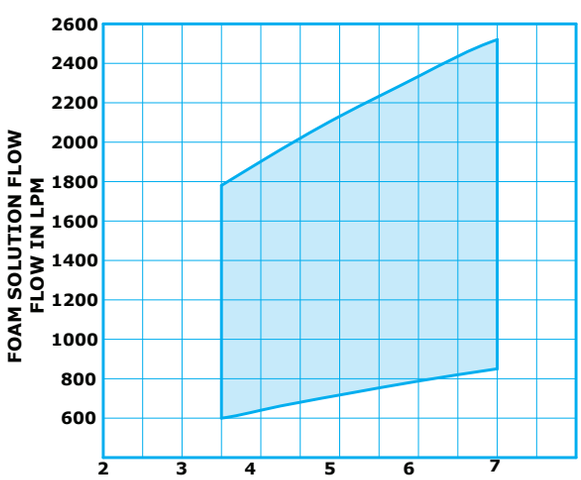
PRESSURE VS FLOW PERFORMANCE CHARACTERISTIC
FM APPROVED WITH FOAM CONCENTRATE AR-AFFF 3X3-C6



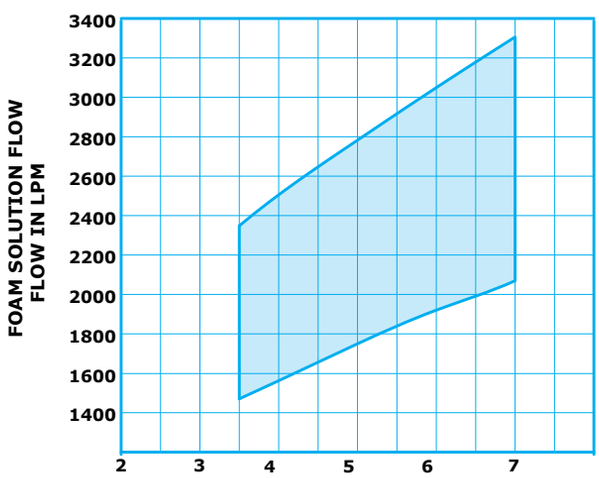
3A FCC & 3A FCS 65 NB



3A FCC & 3A FCS 80 NB



3A FCC & 3A FCS 100 NB



3A FCC & 3A FCS 150 NB

MODEL - 3A FMC & 3A FMS

TECHNICAL DATA	
MODEL	3A FMC-50, 3A FMC-65 Carbon Steel Construction 3A FMS-50, 3A FMS-65 Sta inless Steel Construction
INLET SIZE	50 NB, 65 NB
WORKING PRESSURE	Minimum 2.8 Kg/sq.cm. (40 PSI) Maximum 7 Kg/sq.cm. (100 PSI)
FLANGE CONNECTION	ANSI B16.5 class 150#SORF
FINISH	Red RAL 3001 standard supply Other shade optional
WEIGHT (Approx.)	50 NB - 9.9 Kg 65 NB - 14.0 Kg
APPROVAL	FM Approved Refer Table-I & Table-II
ORDERING INFORMATION	Specify: a) Model and inlet size b) Inlet pressure c) Flow Solution flow required. d) Inlet Outlet flange e) Type of Foam Concentrate used

APPLICATION

Foam Maker is used for one of the most common applications of protecting tank seal in vertical liquid storage tank with internal floating roof with low expansion foam system. The application of aspirated foam is on the basis of the risk comprising the area in the annular ring between the rim of the floating roof and the tank shell. The Foam system design guidelines generally used are in accordance with NFPA11 standard. The Foam Makers are defined by NFPA 11 as Type II discharge outlets for delivering the low expansion aspirated foam to the seal. The Foam Makers are widely used with the Inline Foam Inductor, Balance Pressure Foam Proportioning system, Bladder Tank system and Foam tenders.

SPECIFICATION

Foam Maker is an air aspirating foam generator connected to the foam pourer to deliver the aspirated foam gently into the tank seal area. Foam maker covers wide range of foam solution rates from 75 to 557 litres per minute at 2.8 to 7 kg/sq.cm. inlet pressure. The orifice is field replaceable in the event of change in design parameters. The foam is produced by introducing air into the foam solution stream.

The inlet of foam maker is designed to create venturi jet which draws air into the foam solution stream. The air is drawn into the foam solution through holes located on the foam maker covered with stainless steel screen to exclude nesting birds and insects. The aerated foam is directed into the pourer for the gentle application of the expanded foam. The pourers are available in different models.*

*** Refer to FM directory for specific foam concentrate along with working pressure and flow details.**

INSTALLATION, TESTING AND MAINTENANCE

Carefully unpack Foam Maker. While unpacking and installation, it is to be handled with care and shocks to be avoided. Check visually for any damages. While installing, ensure that the Foam Maker is not under stress due to any misalignments in installation or variations of system piping. Ensure that the strainer assembly is clear from any blockages or damages. if strainer assembly is either blocked or damaged will adversely affect the performance of the equipment. Qualified and trained person must commission the system. After few initial successful tests, an authorized person must be trained to perform inspection and testing of the system. It is recommended to carry out physical inspection of the system regularly. The system must be fully tested at least once in a year or in accordance to standards of the organization having local jurisdiction. Do not turn off the system or any valve to make repair or test the system, without placing a roving Fire Patrol in the area covered by the system. The Patrol should continue until the system is put back in service. Also inform the local security guard and control alarm station, so as to avoid false alarm.

Each system is to be flushed properly. To test the Foam Maker without discharging the foam into the tank seal area, the foam maker is to be rotated 180˚ away from the wind shield. The air screen is to be inspected periodically for obstruction of air inlet holes. If any obstruction is noticed, remove the same and flush if necessary. The foam maker outlet and pourer, if exposed to atmospheric condition, should be periodically inspected for nest and other obstructions. Any obstruction if noticed must be removed and flushed to clear the discharge path.

NOTE:

1. A provision is to be made for pressure gauge mounting at inlet of foam maker, which may be plugged after successful commissioning of the system. This will help to analyse the system while commissioning.
2. The owner is responsible for the testing, inspection and maintenance of the foam maker and the system.
3. Fm approval of equipment are valid only when used with hd foam concentrate in a manner as per fm approval data.
4. Fm approval is valid only when total system is having fm approved products.
5. Refer to the individual foam fm approval for operating and limitation with each foam concentrate and foam maker.

Selection of 3A Foam Maker:

To select the size of the Foam Maker use the following formula:

$Q = K \sqrt{P}$

Where,

Q = Total solution flow in litres per minute.

K = Constant for Foam Chamber

P = Inlet pressure in kg/sq.cm.

Example:

To find K factor: Q = 150 LPM

P = 3.5 Kg/sq.cm.

$K = 150 \div \sqrt{3.5} = 80.17$

The K-Factor 80.17 falls within the range of the Foam Maker having 50NB size. Hence 50NB size Foam Maker to be selected.

The Foam Maker can also be selected by using graph.

TABLE I - Selection of 50 NB 3A FMC & FMS Foam Maker

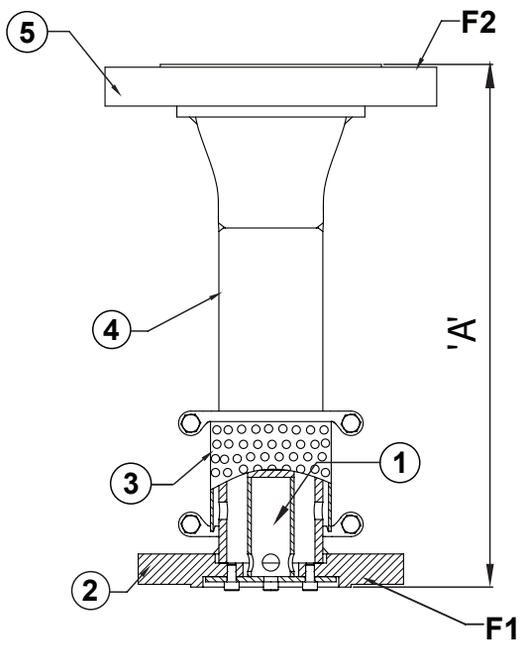
FOAM CONCENTRATE	AFFF 3%	AR-AFFF 3X3%
* APPROVALS	FM APPROVED	
WORKING PRESSURE	2.8 Kg/cm^2 to 7 Kg/cm^2	5.2 Kg/cm^2 to 7 Kg/cm^2
K-FACTOR	56.8 to 132.3	99.5 to 138.0

TABLE II - Selection of 65 NB 3A FMC & FMS Foam Maker

FOAM CONCENTRATE	AFFF 3%	AR-AFFF 3X3%
* APPROVALS	FM APPROVED	
WORKING PRESSURE	4.9 Kg/cm^2 to 7 Kg/cm^2	3.5 Kg/cm^2 to 7 Kg/cm^2
K-FACTOR	158 to 210.5	82.9 to 211.7

* Refer to FM directory for specific foam concentrate, working pressure and flow.

FOAM MAKER



DIMENSIONS OF FOAM MAKER
in millimeter (Approximate)

MODEL	FOAM MAKER SIZE	INLET (F1)	OUTLET (F2)	A
3A FMC-50 & 3A FMS-50	50NB	50NB	80NB	300
3A FMC-65 & 3A FMS-65	65NB	65NB	100NB	400

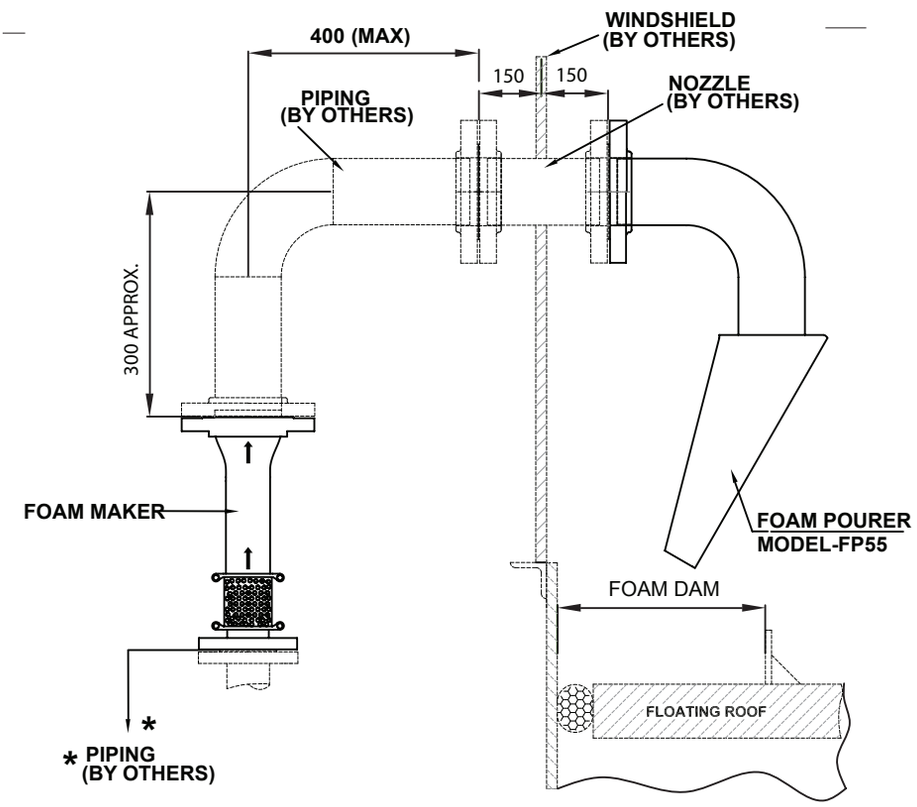
PART LIST

ITEM NO.	DESCRIPTION	MATERIAL SPECIFICATION	
		3A FMA	3A FMA-S
1	ORIFICE ASSEMBLY	STAINLESS STEEL	STAINLESS STEEL
2	INLET FLANGE	STEEL	STAINLESS STEEL
3	STRAINER ASSEMBLY	STAINLESS STEEL	STAINLESS STEEL
4	FOAM MAKING CHAMBER	STEEL PIPE	SS PIPE
5	OUTLET FLANGE	STEEL	STAINLESS STEEL

NOTE :

Strainer Assembly consists of SS perforated sheet, SS Strainer holder & Galvanised Nut/Bolt.

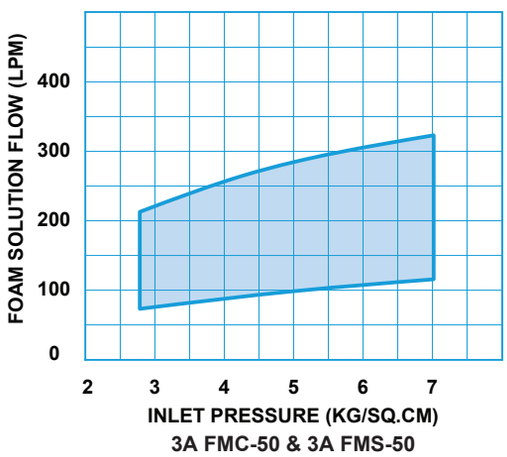
TYPICAL INSTALLATION OF FOAM MAKER WITH POURER



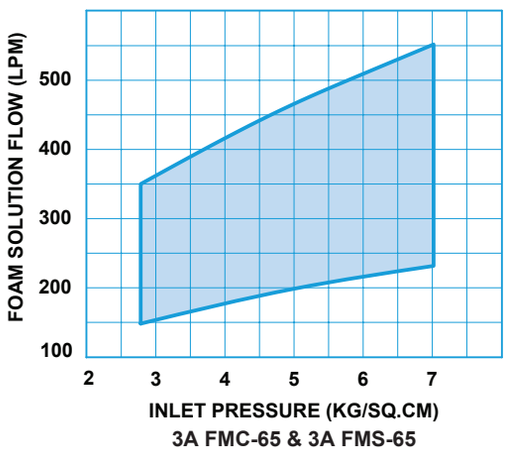
NOTE:

1. Above dimensions (in mm) are for general guidelines only. The system designer can adopt the dimensions as per NFPA/OISD or as per the governing rules & ordinance having local jurisdiction.
2. See the FM Approval details for foam details or contact 3A YANGIN sales.
3. Foam Pourer Model - FP55 is standard supply in carbon steel material and optional in stainless steel.

PRESSURE VS FLOW PERFORMANCE CHARACTERISTIC
FM APPROVED WITH FOAM CONCENTRATE AFFF 3%

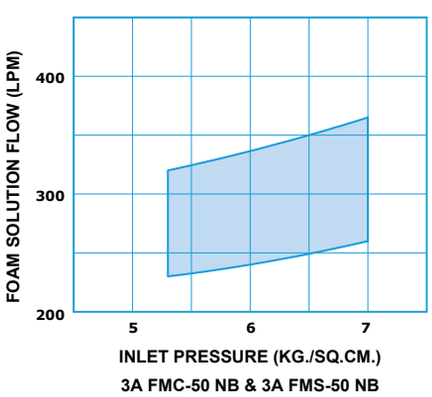


3A FMC-50 & 3A FMS-50

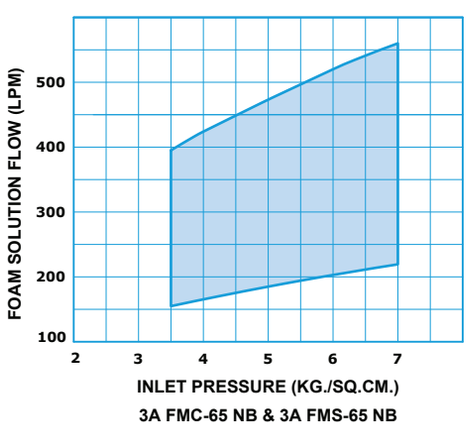


3A FMC-65 & 3A FMS-65

PRESSURE VS FLOW PERFORMANCE CHARACTERISTIC
FM APPROVED WITH FOAM CONCENTRATE AR-AFFF 3X3%



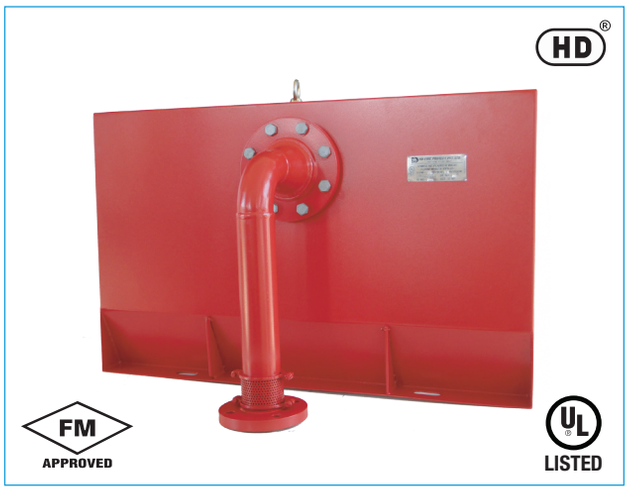
3A FMC-50 NB & 3A FMS-50 NB



3A FMC-65 NB & 3A FMS-65 NB

RPA & RPA-S

TECHNICAL DATA	
MODEL	RPA 65 – Carbon Steel RPA-S 65 – Stainless Steel
SIZE	65 NB INLET
WORKING PRESSURE	Refer Table-I
FLANGE CONNECTION	ANSI B16.5 class 150#
FINISH	Red RAL 3001
APPROVAL	UL Listed & FM Approved Refer Table-I
ORDERING INFORMATION	a) Model b) Flow & Pressure at inlet of each Foam Pourer c) Foam concentrate used



APPLICATION

HD Rim Seal Foam Pourer – RPA consists mainly of Foam Maker, a windshield and an integral deflector. The RPA is designed to deliver fully aspirated foam directly to the annular seal area of open top floating roof tank. The Rim Seal Foam Pourer is used for one of the most common applications of protecting tank seal in vertical liquid storage tank with internal floating roof with low expansion foam system. The application of aspirated foam is on the basis of the risk comprising the area in the annular ring between the rim of the floating roof and the tank shell. The Foam system design guidelines generally used are in accordance with NFPA 11 standard. Rim Seal Foam Pourers are defined by NFPA 11 as Type II discharge outlets for delivering the low expansion aspirated foam to the seal. The Rim Seal Foam Pourers are widely used with Inline Foam Inductor, Balance Pressure Foam Proportioning System, Bladder Tank system or Foam tenders.

SPECIFICATION

The Rim Seal Foam Pourer is an air aspirating foam generator connected to the foam pourer to deliver the aspirated foam gently into the tank seal area. The rim seal foam pourer covers a wide range of foam solution rates from 50 to 550 liters per minute at 2.8 to 7 kg/ sq.cm inlet pressure. Each rim seal foam pourer is supplied with an orifice plate, designed for the required flow at inlet pressure. The orifice is field replaceable in the event of change in design parameters. The foam is produced by introducing air into the foam solution stream. The inlet of foam maker is designed to create venturi jet which draws air into the foam solution stream. The air is drawn into the foam solution through holes located on the foam maker covered with stainless steel screen to exclude nesting birds and insects.

SYSTEM DESIGN REQUIREMENT

For essential requirement of appropriately designed foam pouring system for storage tanks refer NFPA-11/ OISD/ TAC/ Governmental codes or ordinances wherever applicable.

* Refer to UL/ FM directory for specific foam concentrate working pressure.

INSTALLATION, TESTING & MAINTENANCE

Carefully unpack Rim Seal Pourer. While unpacking and installation it is to be handled with care and shocks to be avoided. Check visually for any damages. While installing, ensure that the Rim Seal Pourer is not under stress due to any misalignments in installation or variations of system piping. Ensure that the strainer assembly is clear from any blockages or damages. If strainer assembly is either blocked or damaged, it will adversely affect the performance of the equipment.

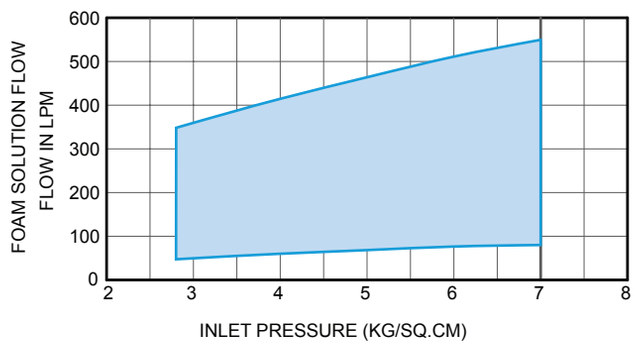
Qualified and trained person must commission the system. After few initial successful tests, an authorized person must be trained to perform inspection and testing of the system.

It is recommended to carry out physical inspection of the system regularly. The system must be fully tested at least once in a year or in accordance to the standards of the organization having local jurisdiction. Do not turn off the system or any valve to make repair or test the system, without placing a roving Fire Patrol in the area covered by the system. The Patrol should continue until the system is put back in service. Also inform the local security guard and control alarm station, so as to avoid false alarm. Each system is to be flushed properly.

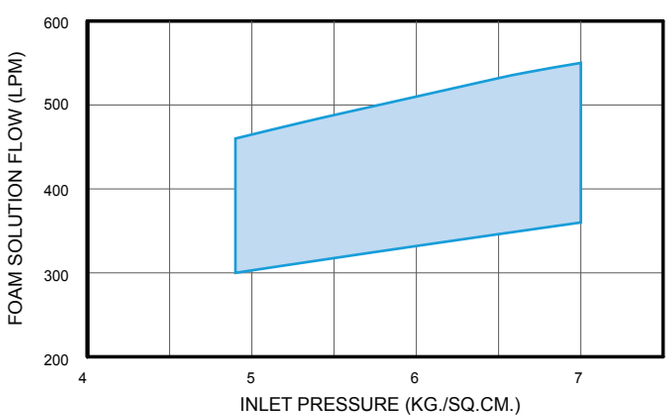
To test the RPA without discharging the foam into the tank seal area, the RPA is to be rotated 180° away from the wind shield. The air screen is to be inspected

periodically for obstruction of air inlet holes. If any obstruction is noticed, remove the same and flush, if necessary. The RPA outlet and pourer, if exposed to atmospheric condition, should be periodically inspected for nest and other obstructions. The obstruction, if noticed, must be removed and flushed to clear the discharge path. The owner is responsible for testing, inspection and maintenance of the Rim Seal Foam Pourer.

PRESSURE VS FLOW PERFORMANCE CHARACTRERISTIC UL LISTED WITH FOAM CONCENTRATE AFFF 3%



PRESSURE VS FLOW PERFORMANCE CHARACTRERISTIC FM APPROVED WITH FOAM CONCENTRATE AFFF 3%



PRESSURE VS FLOW PERFORMANCE CHARACTRERISTIC FM APPROVED WITH FOAM CONCENTRATE HD AR-AFFF 3X3%

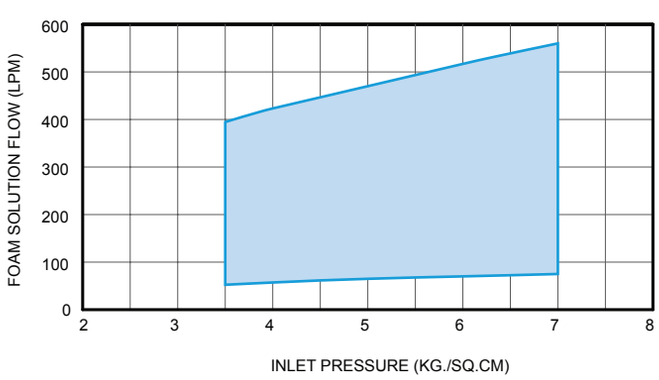


TABLE I - Selection of HD RIM SEAL FOAM POURER

FOAM CONCENTRATE	AFFF 3%	AFFF 3%	AR-AFFF 3X3%
* APPROVALS	UL LISTED	FM APPROVED	
WORKING PRESSURE	2.8 Kg/cm² To 7 Kg/cm²	4.9 Kg/cm² To 7 Kg/cm²	3.5 Kg/cm² To 7 Kg/cm²
K-FACTOR	30 To 208	135.5 To 208	29 To 211

*** Refer to UL/FM directory for specific foam concentrate, working pressure and flow.**

To calculate the K Factor of Rim Seal Pourer, use the following formula:

$Q = K \sqrt{P}$

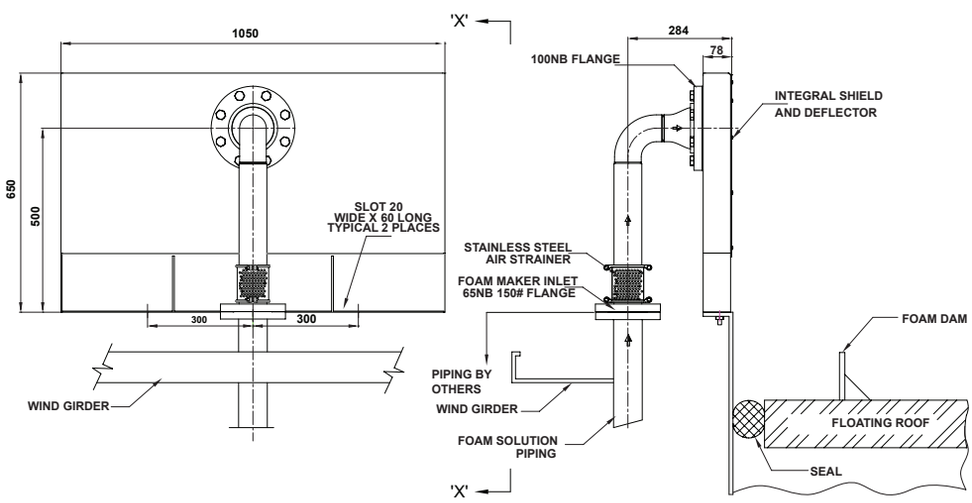
Where,

Q = Total solution flow in litres per minute.

K = Constant for Foam Chamber

P = Inlet pressure in kg/sq.cm.

TYPICAL INSTALLATION OF RIM SEAL FOAM POURER
MODEL: RPA 65 & RPA-S 65



VIEW X - X

All Dimensions are in MM (Approx.)

NOTE:

1. STRAINER ASSEMBLY CONSISTS OF SS PERFORATED SHEET, SS STRAINER HOLDER & GALVANISED NUT/BOLT.
2. A PROVISION IS TO BE MADE FOR PRESSURE GAUGE MOUNTING AT INLET OF RPA, WHICH MAY BE PLUGGED AFTER SUCCESSFUL COMMISSIONING OF THE SYSTEM. THIS PROVISION WILL HELP TO ANALYSE THE SYSTEM WHILE COMMISSIONING.
3. FM APPROVAL AND UL LISTING OF EQUIPMENT ARE VALID ONLY WHEN USED WITH HD FOAM CONCENTRATE IN A MANNER AS LISTED AND AS IN APPROVAL DATA.
4. FM APPROVAL IS VALID ONLY WHEN TOTAL SYSTEM IS HAVING APPROVED PRODUCTS.
5. REFER TO THE INDIVIDUAL FOAM UL LISTING AND FM APPROVAL FOR OPERATING LIMITATION WITH EACH FOAM CONCENTRATE AND RIM SEAL FOAM POURER.

F1 & H

TECHNICAL DATA :	
MODEL	F1 - Stainless Steel H - Bronze
MOUNTING	Pendent
MAXIMUM WORKING PRESSURE	12 Bar (175 PSI)
RECOMMENDED OPERATING PRESSURE	2.1 Bar (30 PSI) minimum 4.2 Bar (60 PSI) maximum
END CONNECTION	1/2" BSPT (1/2" NPT Optional)
K-FACTOR	K-42 standard (K-2.95) Other K-factors can be provided as optional without Listing & Approvals
APPROVAL	UL Listed & FM Approved
FINISH	Natural finish
WEIGHT	0.465 Kg. (Approximate)
ORDERING INFORMATION	Please specify : Model, End connection

APPLICATION

The Foam-Water Sprinklers are used in the deluge foam system to protect the risk where foam is required to be applied from overhead sprinklers and is to be followed with plain water in a standard sprinkler pattern.

Foam-Water Sprinklers protect the loading and unloading area in the event of a spill fire with low expansion foam systems. These are useful in other applications like Air Craft Hangers, Warehousing etc.

SPECIFICATION

Foam-Water Sprinklers are open and air aspirating type. The pattern of coverage is similar to the conventional sprinkler head. The Foam-Water Sprinkler has standard orifice with K-factor of 42.

The Foam-Water Sprinklers are designed to operate at a minimum of 2.1 Bar pressure and maximum of 4.2 Bar pressure. The Foam-Water Sprinkler with K-42 will deliver about 61 LPM at 2.1 Bar pressure. The standard coverage per Foam-Water Sprinkler is 9.3 sq.m. (100 sq.ft.)

SYSTEM DESIGN

The Approval of the Foam Sprinkler is based on the requirements of NFPA13 & NFPA16. Discharge pattern provided is indicative only and it is not to be used for design purpose. Spacing between the sprinklers should not exceed as mentioned in NFPA 13 for extra hazard occupancies.

INSTALLATION, TESTING & MAINTENANCE

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

Foam-Water Sprinkler which is visibly damaged should not be installed.

Use Teflon tape of soft thread sealant on male thread of the sprinkler. The sprinkler must be tightened in to fitting. Excessive tightening torque may result into serious damage to sprinkler arms and deflector, which may affect spray pattern of the nozzle and its perfomance. Do not apply wrench on threading, it has to be applied on flat area of Sprinkler.

It is recommended that water foam spray system be inspected regularly by authorised technical personal. The nozzle must be checked for atmospheric effects, external and internal obstruction, blockage if any. The nozzles should be cleaned or replaced if required.

The system must be operated with optimum water flow at least twice in a year or as per the provisions of NFPA or as per authority having jurisdiction.

The owner is responsible for the testing, inspection and maintenance of the Foam-Water Sprinkler and system.

NOTE:

(I) Foam-Water Sprinkler and Foam concentrate are listed together.

(ii) FM Approval is valid when total system is having FM Approved products.

(iii) UL Listed:

- AFFF 3% *
- AR-AFFF 3X3% *
- FP 3% *

* With minimum application rate of 0.16 GPM/Sq.Feet (6.5 LPM/Sq.Meter)

FM Approved:

- AFFF 3% with 10' x 10' spacing, minimum height of 8 feet 9 inches, with application density of 0.3 GPM/Sq.Feet (12.2 LPM/Sq.Mtr)
- AR-AFFF 3/3% with 10' x 10' spacing, minimum height of 4 feet 6 inches, with application density of 0.3 GPM/Sq.Feet (12.2 LPM/Sq.Mtr)

(iv) Refer to individual UL Listing and FM Approval for operating limitation with each foam concentrate and Foam-Water Sprinkler.

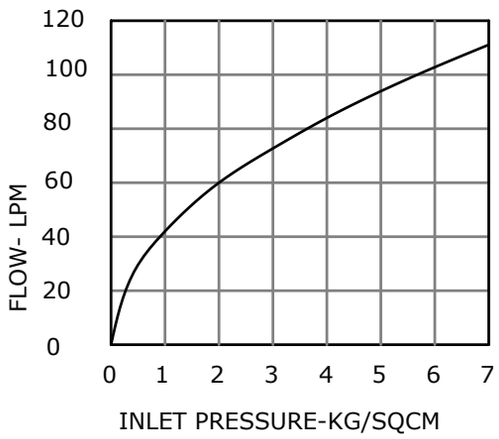
To meet intent of NFPA-16, Foam-Water Sprinklers must be able to sufficiently distribute water after depletion of foam.

Not less than two Foam-Water Sprinklers are to be installed in any area of hazard.

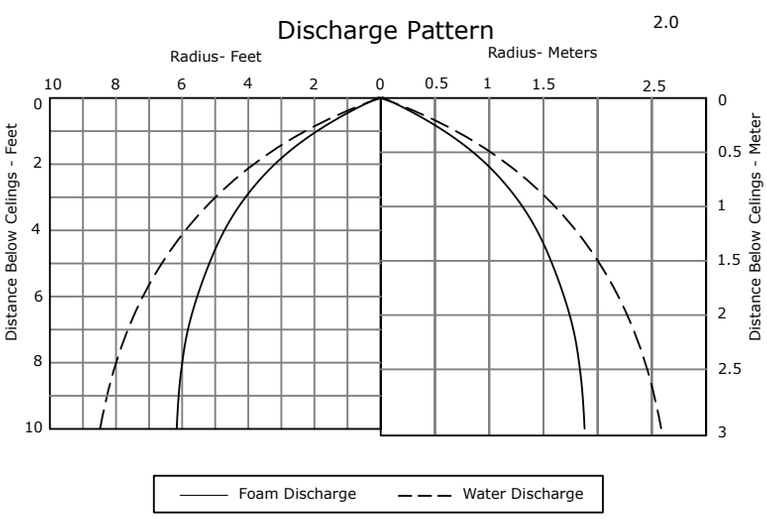
Marking on Foam-Water Sprinkler:

(i) K-Factor
(ii) SIN Number - HD 331
(iii) Model
(iv) Year of Manufacturing
(v) (HD) Trademark
(vi) UL & FM mark
(vii) Pendent

PRESSURE VS FLOW PERFORMANCE CHARACTERISTIC

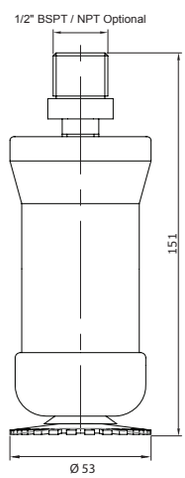


DISCHARGE PATTERN



For reference only - not suitable for system design.

DIMENSIONS



LIMITED WARRANTY

3A KÖPÜKLÜ YANGIN KORUNUM SİSTEMLERİ SAN. VE TİC. LTD. ŞTİ. hereby referred to as 3A YANGIN warrants to the original purchaser of the fire protection products manufactured by 3A YANGIN and to any other person to whom such equipment is transferred, that such products will be free from defect in material and workmanship under normal use and care, for two (2) years from the date of shipment by 3A YANGIN. Products or Components supplied or used by 3A YANGIN, but manufactured by others, are warranted only to the extent of the manufacturer's warranty. No warranty is given for product or components which have been subject to misuse, improper installation, corrosion, unauthorized repair, alteration or un-maintained. 3A YANGIN shall not be responsible for system design errors or improper installation or inaccurate or incomplete information supplied by buyer or buyer's representatives. 3A YANGIN will repair or replace defective material free of charge, which is returned to our factory, transportation charge prepaid, provided after our inspection the material is found to have been defective at the time of initial shipment from our works. 3A YANGIN shall not be liable for any incidental or consequential loss, damage or expense arising directly or indirectly from the use of the product including damages for injury to person, damages to property and penalties resulting from any products and components manufactured by 3A YANGIN. 3A YANGIN shall not be liable for any damages or labour charges or expense in making repair or adjustment to the product. 3A YANGIN shall not be liable for any damages or charges sustained in the adaptation or use of its engineering data & services. In no event shall's product liability exceed an amount equal to the sale price. The foregoing warranty is exclusive and in lieu of all other warranties and representation whether expressed, implied, oral or written, including but not limited to, any implied warranties or merchantability or fitness for a particular purpose. All such other warranties and representations are hereby cancelled.

NOTICE :

The equipment presented in this bulletin is to be installed in accordance with the latest publication standards of NFPA or other similar organisations and also with the provision of government codes or ordinances wherever applicable.

The information provided by us is to the best of our knowledge and belief, and consist of general guidelines only. Site handling and installation control is not in our scope. Hence we give no guarantee for result and take no liability for damages, loss or penalties whatsoever, resulting from our suggestion, information, recommendation or damages due to our product.

Product development is a continuous programme of 3A KÖPÜKLÜ YANGIN KORUNUM SİSTEMLERİ SAN. VE TİC. LTD. ŞTİ. and hence the right to modify any specification without prior notice is reserved with the company.

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