FOAM MAKER

MODELS - FMA & FMA-S, FMF & FMF-S

HD FIRE PROTECT LIMITED

TECHNICAL DATA

MODELS	**Carbon Steel construction:** FMA 50, FMA 65 FMF 50, FMF 65, FMF 80 **Stainless Steel construction:** FMA-S 50, FMA-S 65 FMF-S 50, FMF-S 65, FMF-S 80
INLET SIZE	50 NB, 65 NB, 80 NB
WORKING PRESSURE	Minimum 2.1 kg/sq.cm (40 psi) Maximum 7 kg/sq.cm (100 psi (Refer Table -I)
FLANGE CONNECTION	ANSI B16.5 class 150#SORF
FINISH	Red RAL 3001 standard supply Other shade optional
WEIGHT (Approx.)	50 NB - 9.2 kg 65 NB - 14.4 kg 80 NB - 19.75 kg
APPROVAL	UL Listed & FM Approved Refer Table-I
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 2.1 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 UL / FM directory for specific foam concentrate along with working pressure and flow details.**

INSTALLATION, TESTING AND MAINTENANCE

Carefully unpack the foam maker. Handle it with care during unpacking and installation, avoiding shocks or impacts. Visually inspect the foam maker for any damage. During installation, ensure the foam maker is not subjected to stress caused by misalignment or variations in system piping. Verify that the strainer assembly is free from blockages or damage, as any obstruction or defect can adversely affect equipment performance.

The system must be commissioned by qualified and trained personnel. After a few initial successful tests, an authorized person should be trained to perform routine inspections and testing of the system.

Conduct regular physical inspections of the system. Perform a full system test at least once a year or as specified by applicable NFPA/OISD standards or the authority having local jurisdiction.

Do not turn off the system or any valve for repairs or testing without deploying a roving fire patrol in the area covered by the system. The patrol must remain active until the system is back in service. Additionally, notify the local security guard and control alarm station to prevent false alarms.

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 AND UL LISTING OF EQUIPMENT ARE VALID ONLY WHEN USED WITH HD FOAM CONCENTRATE IN A MANNER AS PER FM/UL APPROVAL DATA.
4. FM APPROVAL IS VALID ONLY WHEN TOTAL SYSTEM IS HAVING FM APPROVED PRODUCTS.
5. REFER TO THE INDIVIDUAL FOAM UL LISTING & FM APPROVAL FOR OPERATING AND LIMITATION WITH EACH FOAM CONCENTRATE AND FOAM MAKER.

Selection of HD 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.

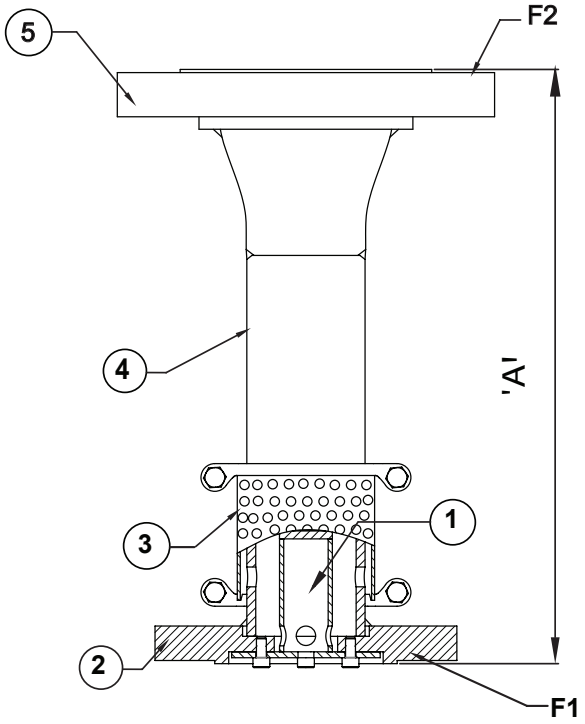
The Foam Maker can also be selected by using graph.

TABLE I - Selection of HD Foam Maker

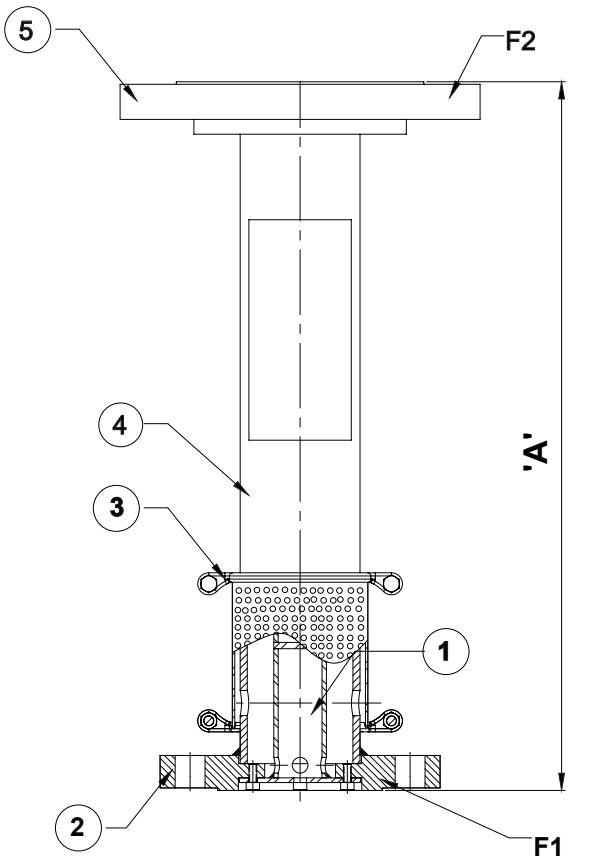
APPROVALS	UL LISTED				FM APPROVED			
FOAM CONCENTRATE	AFFF3%		AR-SFFF F3		AFFF 3%		AR-AFFF 3X3%	
MODELS	K-FACTOR	WORKING PRESSURE	K-FACTOR	WORKING PRESSURE	K-FACTOR	WORKING PRESSURE	K-FACTOR	WORKING PRESSURE
FMA 50 & FMA-S 50	44.8 To 126.6	2.8 To 7 kg/sq.cm	--		56.8 To 132.3	2.8 To 7 kg/sq.cm	99.5 To 138.0	5.2 To 7 kg/sq.cm
FMA 65 & FMA-S 65	89.6 To 207.9	2.8 To 7 kg/sq.cm	--		158 To 210.5	4.9 To 7 kg/sq.cm	82.9 To 211.7	3.5 To 7 kg/sq.cm
FMF 50 & FMF-S 50	--	--	40.7 To 127	2.1 To 7 kg/sq.cm	--	--	--	--
FMF 65 & FMF-S 65	--	--	92.5 To 214.3	2.1 To 7 kg/sq.cm	--	--	--	--
FMF 80 & FMF-S 80	--	--	185.6 To 385.1	2.1 To 7 kg/sq.cm	--	--	--	--

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

FOAM MAKER MODEL FMA, FMA-S



FOAM MAKER MODEL FMF, FMF-S



DIMENSIONS in millimeter (Approximate)

MODEL	FOAM MAKER SIZE	INLET (F1)	OUTLET (F2)	A
FMA 50 & FMA-S 50	50NB	50NB	80NB	300
FMA 65 & FMA-S 65	65NB	65NB	100NB	400
FMF 50 & FMF-S 50	50NB	50NB	80NB	400
FMF 65 & FMF-S 65	65NB	65NB	100NB	450
FMF 80 & FMF-S 80	80NB	80NB	150NB	500

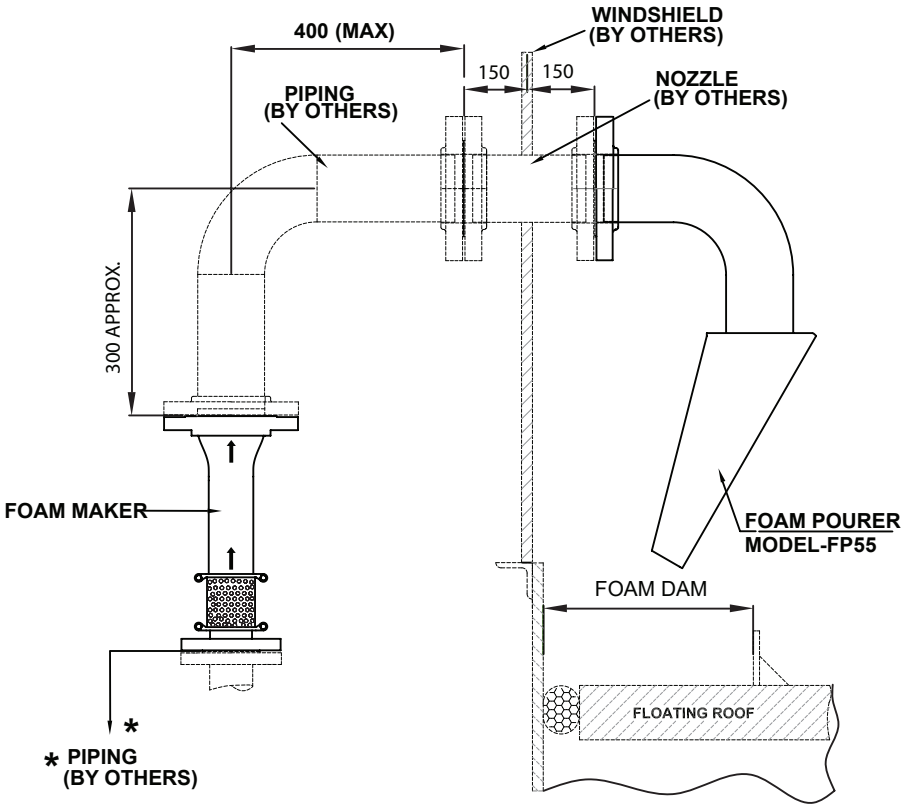
PART LIST

ITEM NO.	DESCRIPTION	MATERIAL SPECIFICATION	
		FMA & FMF	FMA-S & FMF-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.

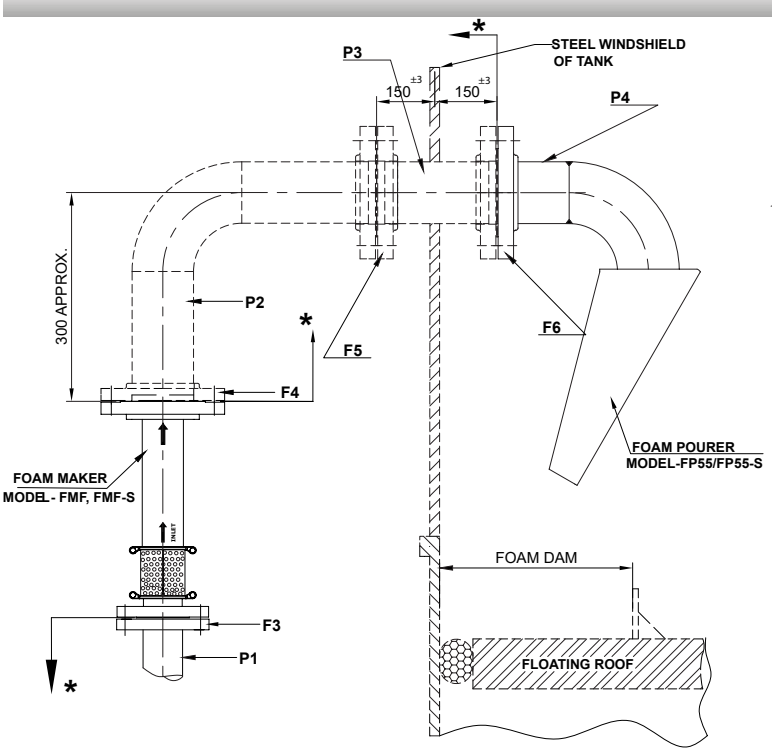
TYPICAL INSTALLATION OF FOAM MAKER MODEL FMA & FMA-S WITH POURER

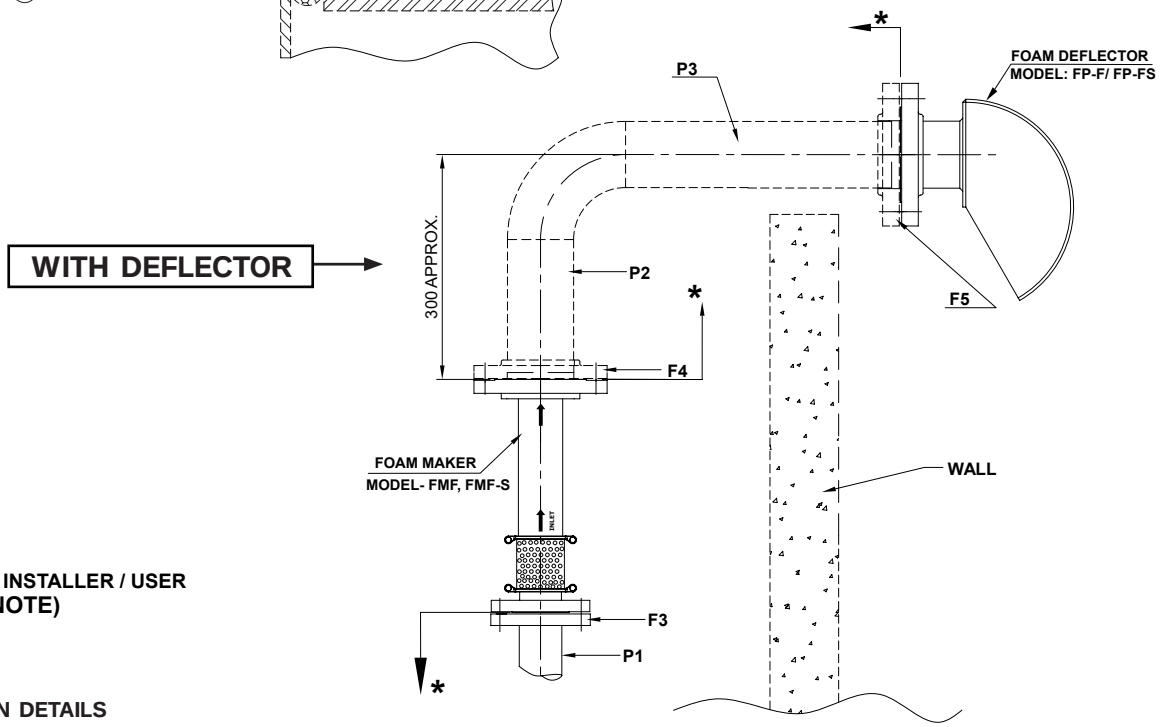


NOTE:

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 UL Listing and FM Approval details for foam details or contact HD sales.**
3. **Foam Pourer Model - FP55 is standard supply in carbon steel material and optional in stainless steel.**

TYPICAL INSTALLATION OF FOAM MAKER MODEL FMF & FMF-S





* PIPING BY INSTALLER / USER (REFER NOTE)

INSTALLATION DETAILS

FOAM MAKER SIZE	FLANGE F3	PIPE P1	FLANGE F4	PIPE P2	FLANGE F5	PIPE P3	FLANGE F6	PIPE P4
50 NB	50 NB	50 NB	80 NB	80 NB	80 NB	80 NB	80 NB	80 NB
65 NB	65 NB	65 NB	100 NB	100 NB	100 NB	100 NB	100 NB	100 NB
80 NB	80 NB	80 NB	150 NB	150 NB	150 NB	150 NB	150 NB	150 NB

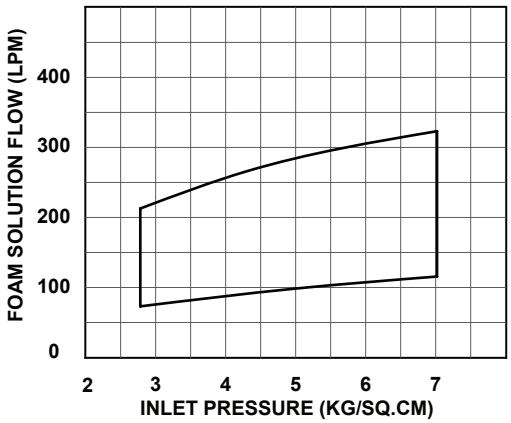
NOTE:

The pressure required at inlet flange is 30psi to 100psi.

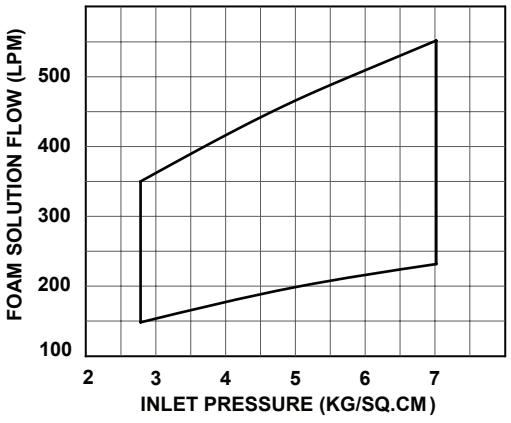
The pipe length permissible depends on hydraulic calculation for each installation, hence the system designer must ensure by hydraulic calcuation.

All dimensions are approximate in mm, unless otherwise specified.

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

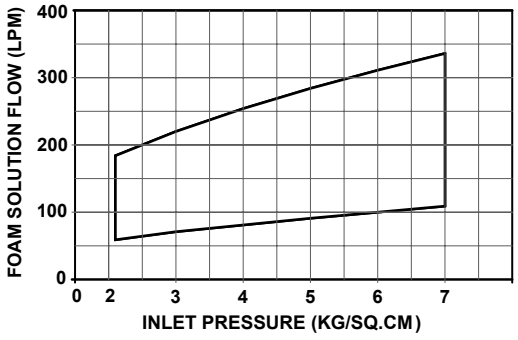


FMA 50 & FMA-S 50

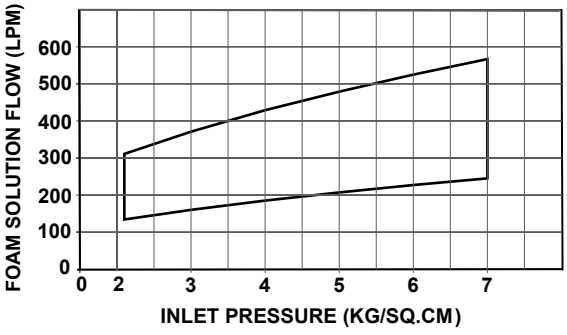


FMA 65 & FMA-S 65

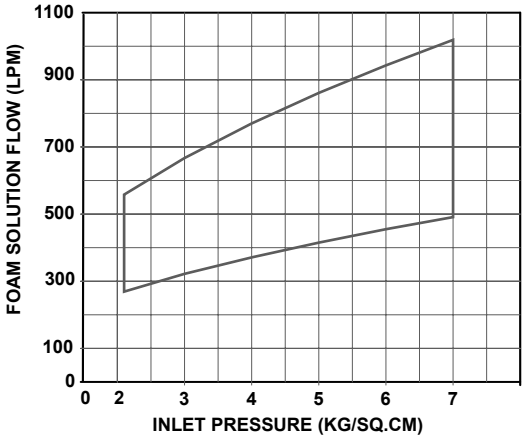
PRESSURE VS FLOW PERFORMANCE CHARACTERISTIC
UL LISTED WITH FOAM CONCENTRATE AR-SFFF F3



FMF 50 & FMF-S 50



FMF 65 & FMF-S 65

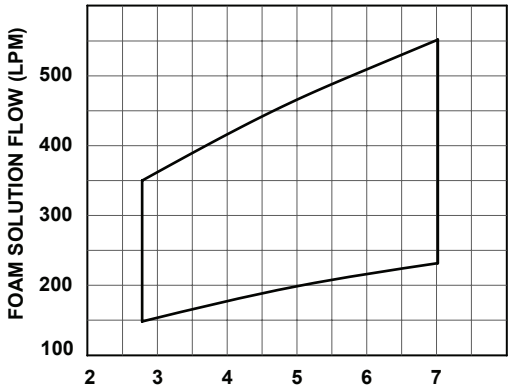


FMF 80 & FMF-S 80

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

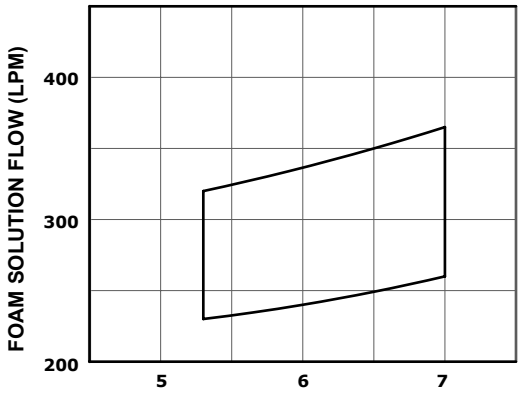


FMA 50 & FMA-S 50

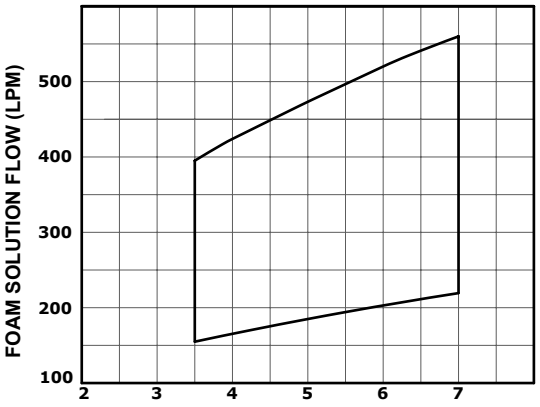


FMA 65 & FMA-S 65

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



FMA 50 NB & FMA-S 50 NB



FMA 65 NB & FMA-S 65 NB

FOAM MAKER ORDERING INFORMATION

XXXX	XXX	X	X	X	X
Models: FMA FMA-S FMF FMF-S	**Inlet Size:** 50 NB 65 NB 80 NB	**Material:** A- Carbon Steel B- Stainless Steel 304 C- Stainless Steel 316 D- Stainless Steel 316L	**Foam Type:** 1- AFFF 3% 2- AR-AFFF 3x3% 3- AR-SFFF F3	**Approval:** U - UL F - FM C - UL & FM	**Painting Shade:** R- Red RAL3001 C- Custom Painted

LIMITED WARRANTY

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D-6/2, ROAD NO. 34, WAGLE INDUSTRIAL ESTATE, THANE 400 604, INDIA.
• TEL: + (91) 22 35287000 • EMAIL: info@hdfire.com
• WEB: www.hdfire.com