

AIR COOLED FLUID COOLERS



ECOTM heat transfer
coolers



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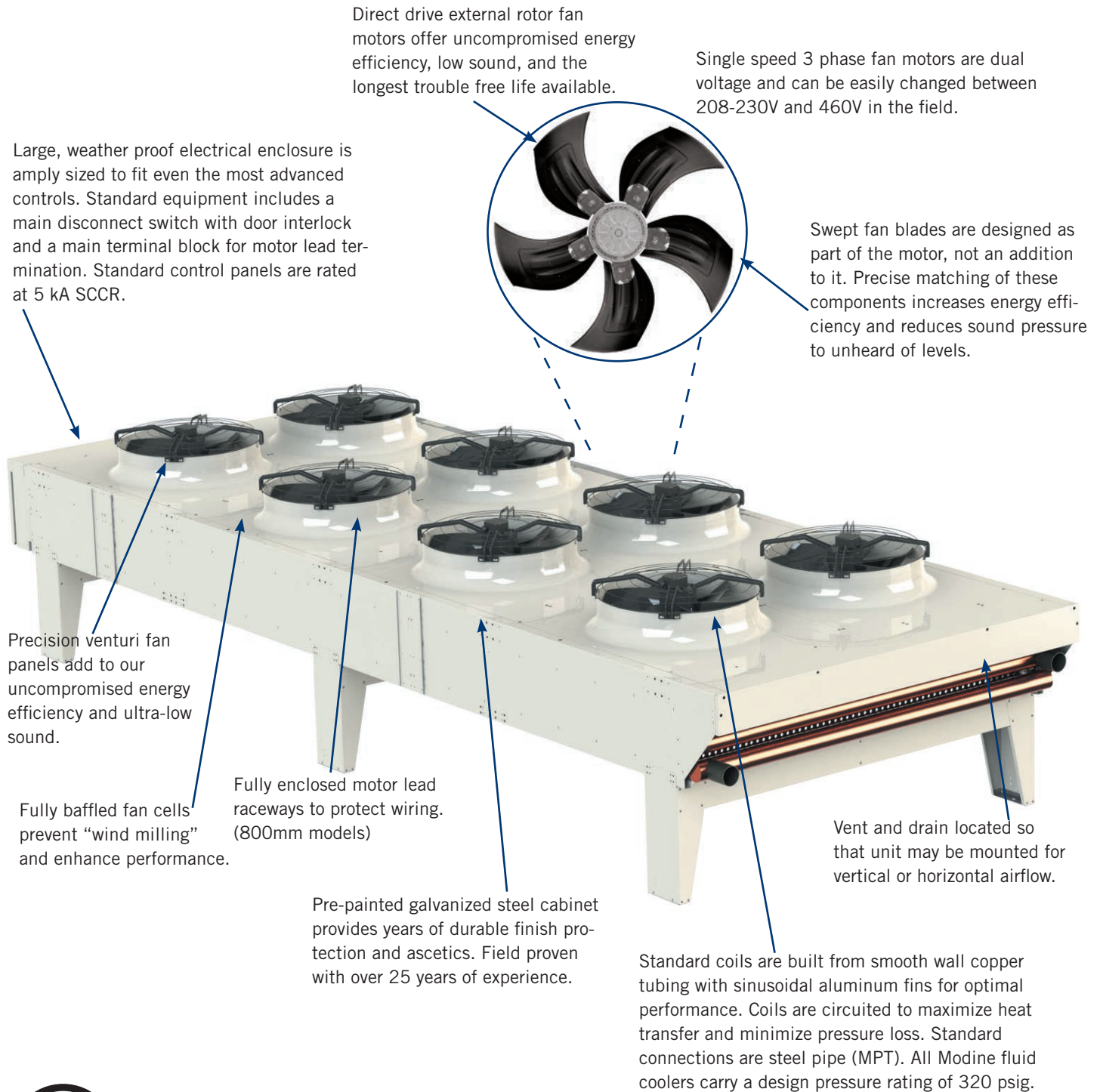
NOMENCLATURE

<u>M</u>	<u>F</u>	<u>S</u>	<u>8</u>	<u>0</u>	<u>1</u>	<u>4</u>	-	<u>3M</u>	<u>1</u>	-	<u>2</u>	<u>C</u>
M = Modine						4 = # Fans Long						
F = Product Type						3M = Circuiting						
S = Fan Motor Type						1 = Connections						
8 = Fan Diameter						2 = Motor Voltage						
0 = Fin Spacing						C = Control Voltage						
1 = # Fans Wide												
Product Type						#Fans Wide						
C - Condenser												
F - Fluid Cooler						#Fans Long						
Fan Motor Type						Circuiting						
S - Standard Single Speed												
V - Variable Speed EC						Connections						
Fan Diameter						Motor Voltage						
8 - 800mm (31.5")						2 - 230/3/60						
5 - 500mm (19.7")						3 - 230/1/60						
						4 - 460/3/60						
Fin Spacing						5 - 575/3/60						
0 = 10 FPI												
8 = 8 FPI						Control Voltage						
2 = 12 FPI						B - 115 Volts						
4 = 14 FPI						C - 230 Volts						
						N - No Controls						

All specifications subject to change without notice.

FLUID COOLERS

NO COMPROMISE STANDARD FEATURES



Intertek
4002117

Conforms to UL Std. 1995
Certified to CAN/CSA Std. C22.2 No. 236-05

FLUID COOLERS

NO COMPROMISE AVAILABLE OPTIONS

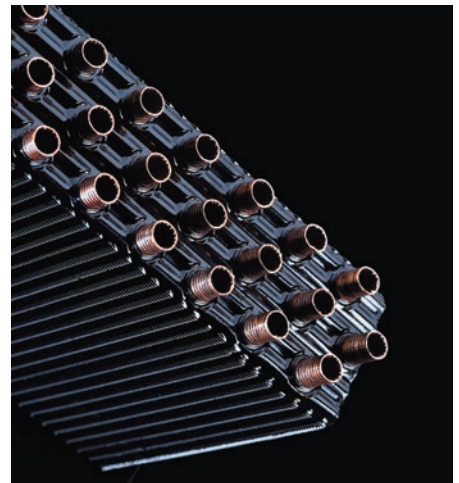
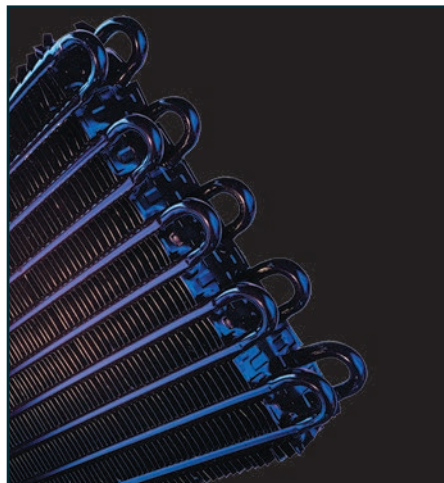
- Ambient or Pressure fan cycling control. Our preferred controller is the Johnson Controls System 450 for uncompromised performance, reliability and precision. Easily programmed, the System 450 is also used to control our variable speed EC fan motors
- Variable speed EC header fans are available on models MCS8 and MCU8 to fill in the airflow gaps created by on/off fan cycling. Variable speed is controlled by pressure only and may be used in conjunction with pressure or ambient on/off fan cycling
- Variable speed control for MCV8 models to maximize performance
- Microprocessor interface boards to communicate with your rack controller or building management system
- Condenser splitting controls
- 230VAC or 115VAC control circuit includes branch fusing and transformer (as required)
- Main power supply fusing
- Multi-circuiting of coils at no additional charge
- Condenser flooding valves
- 8 or 12 fins per inch spacing (round tube models)
- ElectroFin E-Coat coil protection
- Extended mounting legs for increased ground clearance

NO COMPROMISE PROTECTION

Many features have been built into the Modine 800mm Series air-cooled condensers to protect your investment – pre-painted galvanized cabinet, high reliability motors, special design coil mounting – to name a few. But what about the coil? Aluminum fins exposed to corrosive environments will pre-maturely deteriorate resulting in performance loss and eventual failure. Ocean salt spray, acid rain, and aggressive contaminants from nearby incinerators, power plants, and industrial smoke stacks all contribute to this process. For these situations, Modine recommends and offers only the finest coil protection available: ElectroFin E-Coat.

ElectroFin E-Coat provides a uniform, flexible coating over the entire coil with immeasurable impact on thermal conductivity. 100% coverage is assured by the application process, even in the hard to reach center portions of the coil, without bridging between the fins.

Modine offers ElectroFin E-Coat at an affordable price and with minimum impact on lead times. We recommend the application anytime an air-cooled condenser is located near a salt water coast or a potential source of corrosive airborne particles.



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Nominal Performance Data

Nominal performance data is provided as a general guideline only. Due to variations in actual design conditions and coil circuiting, there are a vast number of possible solutions to meet the requirements of each application. For the most accurate performance specifications, the use of Modine software - Modine Select - is recommended. Access to Design Tools is available on-line at www.modineselect.com/na Or, contact your Modine Sales Professional for assistance in selecting the best model for your application.

Nominal Application Parameters

Application	Ambient Temp. (°F)	Ave. Fluid Temp. (°F)	Fluid TD (°F)	Fluid	FPI	Altitude (ft.)
Condenser	95	110	5-15	Water	10	0
Economizer	40	55	5-15	Water	10	0
Industrial	95	140	20-40	Water	10	0

Factors Influencing Performance

Glycol

Glycol added to the heat transfer fluid for freeze protection will reduce fluid cooler capacity (MBH) and increase fluid head loss (HL) through the coil. The chart below shows typical results compared to water. Actual results will vary slightly depending on actual operating conditions and coil circuiting.

% Glycol by Volume	Ethylene Glycol			Propylene Glycol		
	Freeze Point (°F)	MBH	HL	Freeze Point (°F)	MBH	HL
0	+32.0	1.000	1.000	+32.0	1.000	1.000
10	+25.3	0.985	1.140	+26.0	0.988	1.160
20	+16.0	0.965	1.220	+18.8	0.969	1.250
30	+3.6	0.942	1.300	+8.5	0.943	1.340
40	-12.6	0.914	1.400	-6.9	0.907	1.450
50	-34.8	0.880	1.490	-28.6	0.860	1.570

Altitude

Apply the following factors to fluid cooler capacity (MBH) to adjust for lower density air at higher elevations.

Feet Above Sea Level	0	1000	2000	3000	4000	5000	6000	7000	8000
Factor	1.000	0.980	0.952	0.935	0.909	0.893	0.870	0.855	0.806

Fin Spacing

Apply the following factors to fluid cooler capacity (MBH) to adjust for differences in fins spacing (FPI).

Fins Per Inch (FPI)	8	9	10	11	12	13	14
Factor	0.947	0.974	1.000	1.024	1.047	1.069	1.089

FLUID COOLERS

500mm Series Specifications

Performance Data

Model	Fans	Water Cooled Condenser				Economizer				Industrial				Air Flow (CFM)	Sound Pressure (dBA @ 3m)
		GPM		MBH		GPM		MBH		GPM		MBH			
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		
Single Wide 500mm Fan Diameter															
MFS5011-2	1X1	10	20	38	44	10	10	36	40	10	10	105	115	5,490	60.5
MFS5011-3	1X1	10	20	49	57	20	20	48	56	10	10	140	149	5,110	60.5
MFS5011-4	1X1	20	30	55	65	20	20	54	60	10	10	165	174	4,780	60.5
MFS5012-2	1X2	20	30	79	88	30	30	76	85	20	20	236	257	11,140	63.5
MFS5012-3	1X2	30	40	102	118	40	40	99	115	20	30	297	319	10,420	63.5
MFS5012-4	1X2	30	60	118	136	50	50	110	134	20	30	339	370	9,790	63.5
MFS5013-2	1X3	30	40	113	133	40	40	109	126	20	30	339	388	16,480	65.3
MFS5013-3	1X3	30	60	148	172	60	60	144	168	30	50	420	496	15,330	65.3
MFS5013-4	1X3	40	80	172	200	70	70	169	196	30	40	492	532	14,340	65.3

Electrical Data

Model	208-230/1/60				208-230/3/60				460/3/60				Total Watts		SCCR
	HP	FLA	MCA	MOPD	HP	FLA	MCA	MOPD	HP	FLA	MCA	MOPD	1 Phase	3 Phase	
Single Wide 500mm Fan Diameter															
MFS5011-2	1	4.5	7.0	11	1.1	3.3	5.0	9	1.1	2.0	4.0	6	932	1,053	5 kA
MFS5011-3	1	4.5	7.0	11	1.1	3.3	5.0	9	1.1	2.0	4.0	6	939	1,084	5 kA
MFS5011-4	1	4.5	7.0	11	1.1	3.3	5.0	9	1.1	2.0	4.0	6	944	1,109	5 kA
MFS5012-2	1	9.0	11.0	16	1.1	6.6	9.0	12	1.1	4.0	6.0	8	1,861	2,094	5 kA
MFS5012-3	1	9.0	11.0	16	1.1	6.6	9.0	12	1.1	4.0	6.0	8	1,875	2,156	5 kA
MFS5012-4	1	9.0	11.0	16	1.1	6.6	9.0	12	1.1	4.0	6.0	8	1,885	2,206	5 kA
MFS5013-2	1	13.5	16.0	20	1.1	9.9	12.0	15	1.1	6.0	8.0	10	2,796	3,159	5 kA
MFS5013-3	1	13.5	16.0	20	1.1	9.9	12.0	15	1.1	6.0	8.0	10	2,816	3,253	5 kA
MFS5013-4	1	13.5	16.0	20	1.1	9.9	12.0	15	1.1	6.0	8.0	10	2,832	3,328	5 kA

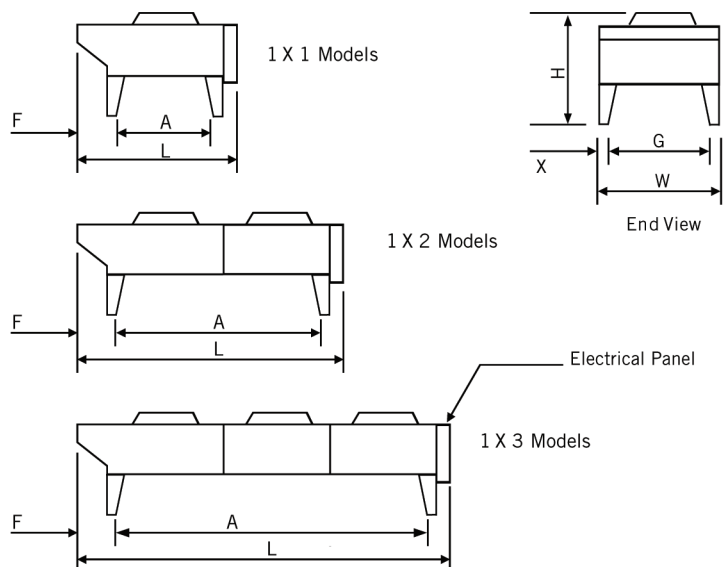
FLUID COOLERS

500mm Series Specifications

Dimensional Data

Model	Overall Dimensions (In.)			Mounting Dim. (In.)				Approx. Net Weight (Lbs. Dry)	Approx. Fluid Weight (Lbs. Water)
	L	W	H	F	A	X	G		
Single Wide 500mm Fan Diameter									
MFS5011-2	54.5	37.3	38.5	11.5	28.0	1.1	35.2	271	21
MFS5011-3								289	29
MFS5011-4								308	38
MFS5012-2	94.5	37.3	38.5	11.5	68.0	1.1	35.2	403	38
MFS5012-3								439	58
MFS5012-4								477	75
MFS5013-2	126.5	37.3	38.5	11.5	100.0	1.1	35.2	517	51
MFS5013-3								567	78
MFS5013-4								621	102

500mm Outline Drawings



FLUID COOLERS

800mm Series Specifications

Performance Data

Model	Fans	Water Cooled Condenser				Economizer				Industrial				Air Flow (CFM)	Sound Pressure (dBA @ 3m)
		GPM		MBH		GPM		MBH		GPM		MBH			
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		
Single Wide 800mm Fan Diameter															
MFS8011-2	1X1	20	30	82	92	20	30	78	89	20	20	226	246	11,600	62.5
MFS8011-3	1X1	30	40	109	122	20	40	103	120	20	30	303	336	11,050	62.5
MFS8011-4	1X1	30	60	119	141	30	50	114	137	20	30	351	380	10,560	62.5
MFS8012-2	1X2	40	50	161	180	30	70	155	184	30	50	471	554	23,210	65.5
MFS8012-3	1X2	50	80	218	246	40	90	206	246	40	70	598	693	22,100	65.5
MFS8012-4	1X2	60	120	253	292	40	110	236	287	40	80	702	804	21,130	65.5
MFS8013-2	1X3	50	70	238	278	40	100	225	274	40	80	724	864	34,810	67.3
MFS8013-3	1X3	70	120	326	374	50	140	300	366	50	10	884	1,091	33,150	67.3
MFS8013-4	1X3	80	180	377	441	70	170	369	433	60	120	1,118	1,248	31,690	67.3
MFS8014-2	1X4	70	90	322	361	50	140	296	369	50	110	978	1,128	46,410	68.5
MFS8014-3	1X4	90	150	422	496	70	190	404	486	70	150	1,239	1,491	44,200	68.5
MFS8014-4	1X4	110	240	506	589	90	230	496	579	80	170	1,470	1,718	42,250	68.5
MFS8015-2	1X5	90	120	393	453	70	160	380	461	70	140	1,255	1,436	58,010	69.5
MFS8015-3	1X5	120	190	532	620	90	240	505	618	80	190	1,572	1,894	55,250	69.5
MFS8015-4	1X5	130	300	625	732	110	280	621	714	100	210	1,890	2,171	52,810	69.5
MFS8016-2	1X6	100	150	477	558	80	160	446	551	80	160	1,487	1,733	69,620	70.3
MFS8016-3	1X6	130	230	631	753	110	250	612	731	100	230	1,946	2,297	66,300	70.3
MFS8016-4	1X6	160	330	755	878	130	330	739	863	120	270	2,297	2,659	63,380	70.3
MFS8017-2	1X7	120	160	568	653	90	160	521	628	90	160	1,711	1,991	81,220	71.0
MFS8017-3	1X7	150	250	741	873	130	250	703	855	120	250	2,300	2,682	77,360	71.0
MFS8017-4	1X7	190	330	886	1,022	150	330	863	998	140	310	2,727	3,112	73,940	71.0
Double Wide 800mm Fan Diameter															
MFS8022-2	2X2	70	90	309	357	60	140	299	365	50	110	903	1,114	46,150	68.5
MFS8022-3	2X2	90	150	422	494	70	190	399	480	70	130	1,166	1,347	43,860	68.5
MFS8022-4	2X2	100	250	494	579	80	220	470	568	80	160	1,389	1,589	41,840	68.5
MFS8023-2	2X3	100	140	471	540	80	210	440	543	80	160	1,437	1,710	69,220	70.3
MFS8023-3	2X3	130	220	640	738	100	270	599	722	90	210	1,717	2,317	65,790	70.3
MFS8023-4	2X3	160	350	741	867	130	330	729	851	110	250	2,090	2,489	62,760	70.3
MFS8024-2	2X4	130	190	626	715	100	290	587	735	100	210	1,941	2,222	92,290	71.5
MFS8024-3	2X4	180	290	828	979	140	380	794	960	130	290	2,425	2,930	87,710	71.5
MFS8024-4	2X4	210	470	993	1,157	170	450	973	1,135	150	330	2,859	3,375	83,680	71.5
MFS8025-2	2X5	170	230	777	895	130	320	737	911	130	280	2,455	2,837	115,370	72.5
MFS8025-3	2X5	220	380	1,043	1,228	170	480	989	1,223	160	300	3,123	3,646	109,630	72.5
MFS8025-4	2X5	260	500	1,226	1,438	210	500	1,219	1,408	190	430	3,696	4,308	104,600	72.5
MFS8026-2	2X6	190	280	927	1,093	160	320	882	1,089	160	320	2,902	3,424	138,450	73.3
MFS8026-3	2X6	250	440	1,235	1,477	210	480	1,199	1,446	200	460	3,832	4,544	131,560	73.3
MFS8026-4	2X6	310	500	1,481	1,714	250	500	1,443	1,685	230	500	4,509	5,205	125,520	73.3
MFS8027-2	2X7	220	320	1,089	1,292	170	320	1,006	1,253	170	320	3,333	3,935	161,510	74.0
MFS8027-3	2X7	300	480	1,469	1,713	250	480	1,375	1,678	230	360	4,522	5,072	153,490	74.0
MFS8027-4	2X7	360	500	1,767	1,993	290	500	1,693	1,960	280	500	5,358	6,049	146,440	74.0

FLUID COOLERS

800mm Series Specifications

Electrical Data

Model	208-230/3/60				460/3/60				575/3/60				Total Watts	SCCR
	HP	FLA	MCA	MOPD	HP	FLA	MCA	MOPD	HP	FLA	MCA	MOPD		
Single Wide 800mm Fan Diameter														
MFS8011-2	1.5	6.8	10.0	16	1.5	3.6	5.0	9	1.5	3.2	5.0	8	1,473	5 kA
MFS8011-3	1.5	6.8	10.0	16	1.5	3.6	5.0	9	1.5	3.2	5.0	8	1,529	5 kA
MFS8011-4	1.5	6.8	10.0	16	1.5	3.6	5.0	9	1.5	3.2	5.0	8	1,591	5 kA
MFS8012-2	1.5	13.6	16.8	23	1.5	7.2	9.0	13	1.5	6.4	9.0	12	2,947	5 kA
MFS8012-3	1.5	13.6	16.8	23	1.5	7.2	9.0	13	1.5	6.4	9.0	12	3,059	5 kA
MFS8012-4	1.5	13.6	16.8	23	1.5	7.2	9.0	13	1.5	6.4	9.0	12	3,182	5 kA
MFS8013-2	1.5	20.4	23.6	30	1.5	10.8	13.0	17	1.5	9.6	12.0	15	4,420	5 kA
MFS8013-3	1.5	20.4	23.6	30	1.5	10.8	13.0	17	1.5	9.6	12.0	15	4,588	5 kA
MFS8013-4	1.5	20.4	23.6	30	1.5	10.8	13.0	17	1.5	9.6	12.0	15	4,773	5 kA
MFS8014-2	1.5	27.2	30.4	37	1.5	14.4	16.0	20	1.5	12.8	15.0	18	5,894	5 kA
MFS8014-3	1.5	27.2	30.4	37	1.5	14.4	16.0	20	1.5	12.8	15.0	18	6,117	5 kA
MFS8014-4	1.5	27.2	30.4	37	1.5	14.4	16.0	20	1.5	12.8	15.0	18	6,361	5 kA
MFS8015-2	1.5	34.0	37.2	44	1.5	18.0	20.0	24	1.5	16.0	18.0	21	7,367	5 kA
MFS8015-3	1.5	34.0	37.2	44	1.5	18.0	20.0	24	1.5	16.0	18.0	21	7,646	5 kA
MFS8015-4	1.5	34.0	37.2	44	1.5	18.0	20.0	24	1.5	16.0	18.0	21	7,955	5 kA
MFS8016-2	1.5	40.8	44.0	50	1.5	21.6	23.0	27	1.5	19.2	21.0	24	8,841	5 kA
MFS8016-3	1.5	40.8	44.0	50	1.5	21.6	23.0	27	1.5	19.2	21.0	24	9,176	5 kA
MFS8016-4	1.5	40.8	44.0	50	1.5	21.6	23.0	27	1.5	19.2	21.0	24	9,546	5 kA
MFS8017-2	1.5	47.6	50.8	57	1.5	25.2	27.0	31	1.5	22.4	25.0	28	10,314	5 kA
MFS8017-3	1.5	47.6	50.8	57	1.5	25.2	27.0	31	1.5	22.4	25.0	28	10,705	5 kA
MFS8017-4	1.5	47.6	50.8	57	1.5	25.2	27.0	31	1.5	22.4	25.0	28	11,138	5 kA
Double Wide 800mm Fan Diameter														
MFS8022-2	1.5	27.2	30.4	37	1.5	14.4	16.0	20	1.5	12.8	15.0	18	5,918	5 kA
MFS8022-3	1.5	27.2	30.4	37	1.5	14.4	16.0	20	1.5	12.8	15.0	18	6,170	5 kA
MFS8022-4	1.5	27.2	30.4	37	1.5	14.4	16.0	20	1.5	12.8	15.0	18	6,423	5 kA
MFS8023-2	1.5	40.8	44.0	50	1.5	21.6	23.0	27	1.5	19.2	21.0	24	8,876	5 kA
MFS8023-3	1.5	40.8	44.0	50	1.5	21.6	23.0	27	1.5	19.2	21.0	24	9,255	5 kA
MFS8023-4	1.5	40.8	44.0	50	1.5	21.6	23.0	27	1.5	19.2	21.0	24	9,634	5 kA
MFS8024-2	1.5	54.4	58.6	65	1.5	28.8	31.0	35	1.5	25.6	28.0	31	11,835	5 kA
MFS8024-3	1.5	54.4	58.6	65	1.5	28.8	31.0	35	1.5	25.6	28.0	31	12,340	5 kA
MFS8024-4	1.5	54.4	58.6	65	1.5	28.8	31.0	35	1.5	25.6	28.0	31	12,845	5 kA
MFS8025-2	1.5	68.0	72.2	79	1.5	36.0	38.0	42	1.5	32.0	35.0	38	14,794	5 kA
MFS8025-3	1.5	68.0	72.2	79	1.5	36.0	38.0	42	1.5	32.0	35.0	38	15,425	5 kA
MFS8025-4	1.5	68.0	72.2	79	1.5	36.0	38.0	42	1.5	32.0	35.0	38	16,056	5 kA
MFS8026-2	1.5	81.6	85.8	92	1.5	43.2	45.0	49	1.5	38.4	41.0	44	17,753	5 kA
MFS8026-3	1.5	81.6	85.8	92	1.5	43.2	45.0	49	1.5	38.4	41.0	44	18,510	5 kA
MFS8026-4	1.5	81.6	85.8	92	1.5	43.2	45.0	49	1.5	38.4	41.0	44	19,268	5 kA
MFS8027-2	1.5	95.2	99.4	106	1.5	50.4	53.0	57	1.5	44.8	47.0	50	20,711	5 kA
MFS8027-3	1.5	95.2	99.4	106	1.5	50.4	53.0	57	1.5	44.8	47.0	50	21,595	5 kA
MFS8027-4	1.5	95.2	99.4	106	1.5	50.4	53.0	57	1.5	44.8	47.0	50	22,479	5 kA

FLUID COOLERS

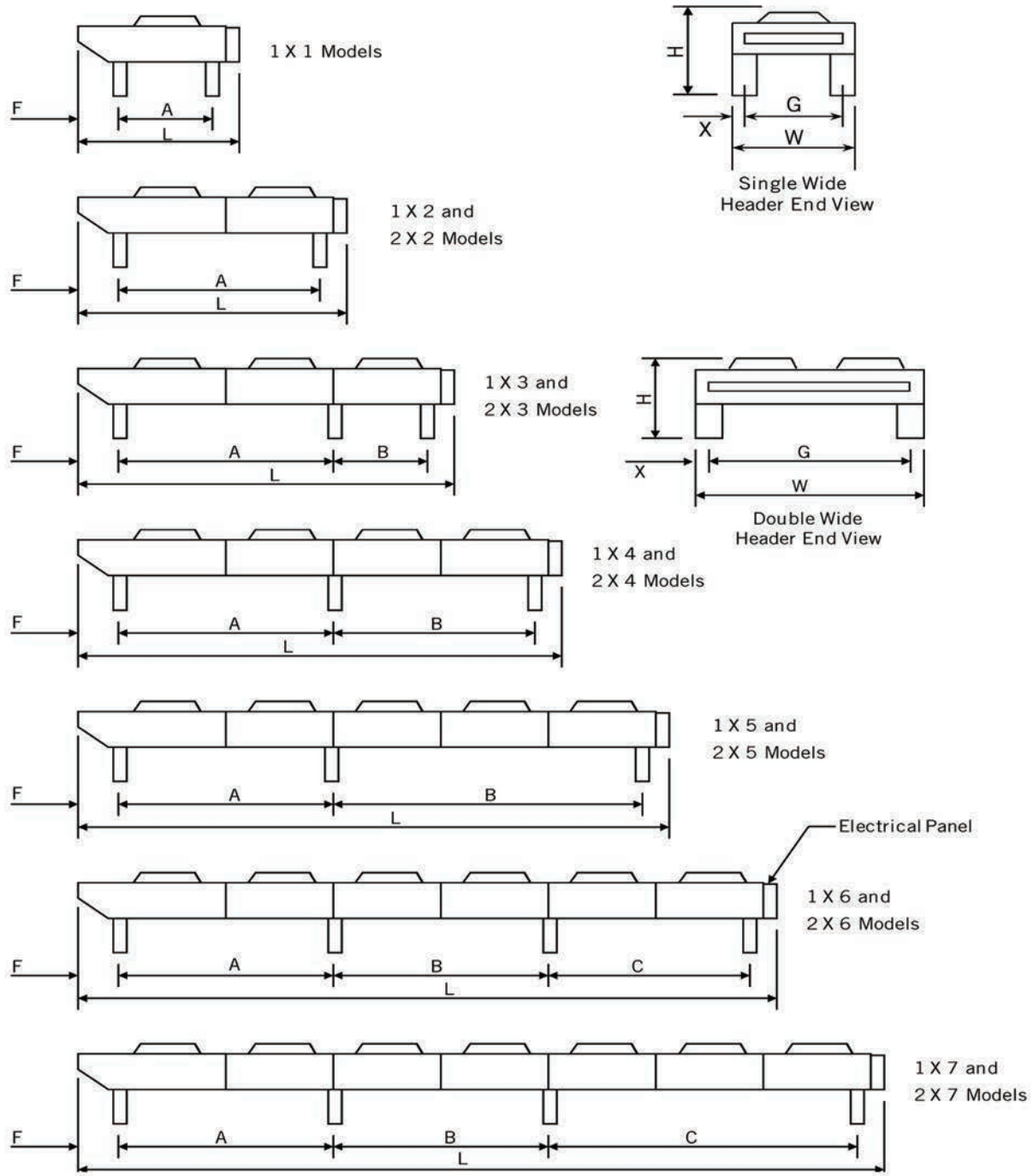
800mm Series Specifications

Dimensional Data

Model	Overall Dimensions (In.)			Mounting Dimensions (In.)						Approx. Net Weight (Lbs. Dry)	Approx. Fluid Weight (Lbs. Water)
	L	W	H	F	A	B	C	X	G		
Single Wide 800mm Fan Diameter											
MFS8011-2	80.9	48.9	54.6	17.7	48.1	---	---	1.3	46.2	627	52
MFS8011-3										677	75
MFS8011-4										730	101
MFS8012-2	138.9	48.9	54.6	17.7	106.2	---	---	1.3	46.2	989	101
MFS8012-3										1,087	145
MFS8012-4										1,189	193
MFS8013-2	196.9	48.9	54.6	17.7	111.1	53.1	---	1.3	46.2	1,271	147
MFS8013-3										1,417	214
MFS8013-4										1,569	290
MFS8014-2	254.9	48.9	54.6	17.7	111.1	111.1	---	1.3	46.2	1,606	190
MFS8014-3										1,800	289
MFS8014-4										2,001	376
MFS8015-2	312.9	48.9	54.6	17.7	111.1	169.1	---	1.3	46.2	1,799	234
MFS8015-3										2,070	337
MFS8015-4										2,349	440
MFS8016-2	370.9	48.9	54.6	17.7	111.1	116.0	111.1	1.3	46.2	1,194	274
MFS8016-3										2,271	398
MFS8016-4										2,605	522
MFS8017-2	428.9	48.9	54.6	17.7	111.1	116.0	169.1	1.3	46.2	2,227	315
MFS8017-3										2,605	460
MFS8017-4										2,994	603
Double Wide 800mm Fan Diameter											
MFS8022-2	138.9	91.9	54.6	17.7	106.2	---	---	1.3	89.2	1,812	200
MFS8022-3										1,997	308
MFS8022-4										2,187	394
MFS8023-2	169.9	91.9	54.6	17.7	111.1	53.1	---	1.3	89.2	2,163	305
MFS8023-3										2,439	433
MFS8023-4										2,721	560
MFS8024-2	254.9	91.9	54.6	17.7	111.1	111.1	---	1.3	89.2	3,011	388
MFS8024-3										3,378	558
MFS8024-4										3,752	727
MFS8025-2	312.9	91.9	54.6	17.7	111.1	169.1	---	1.3	89.2	3,586	450
MFS8025-3										4,098	651
MFS8025-4										4,619	851
MFS8026-2	370.9	91.9	54.6	17.7	111.1	116.0	111.1	1.3	89.2	4,812	529
MFS8026-3										5,426	769
MFS8026-4										6,050	1,009
MFS8027-2	428.9	91.9	54.6	17.7	111.1	116.0	169.1	1.3	89.2	5,573	608
MFS8027-3										6,289	888
MFS8027-4										7,016	1,167

FLUID COOLERS

800mm Outline Drawings



FLUID COOLERS

Connection Data

Header connection sizes are established by fluid flow rates as follows. Standard connections are steel pipe/male NPT. Optional connections are available as red brass/male NPT, steel flange, and copper sweat.

Flow Rate (GPM)	6-12	12.1-20	20.1-40	40.1-65	65.1-98	98.1-150	150.1-260	>260
Connection Size (In.)	1.00	1.25	1.50	2.00	2.50	3.00	3.50	4.00

Control Panels

All Modine fluid coolers are equipped with a large, weatherproof electrical enclosure. The standard control panels include a non-fused disconnect switch with door interlock and a terminal block for the motor leads. A wide variety of optional controls are also available for circuit protection, fan cycling, variable speed control, and micro-processor interface boards. Special requests are always welcome.

Circuit Protection

Available options include primary fusing and motor branch circuit fusing. Individual motor fusing is supplied with individual contactor options. Paired motor fusing is supplied with paired contactor options.

Motor Contactors

Motor contactors are required as part of the fan motor protection system for all single speed motors. Variable speed EC fan motors do not require contactors and they are not recommended for use with these motors. Contactors are offered as one contactor per fan motor ("Individual Contactors") for single and double wide models, or one contactor per pair of adjacent fan motors ("Paired Contactors") for double wide models.

Fan Cycling

Optional electronic controls are available to cycle single speed fan motors on and off based on leaving fluid temperature with the following characteristics:

- Single speed fan motors are cycled with contactors (ordered separately).
- Single wide models cycle fans individually (one contactor per fan motor).
- Double wide models cycle fan motors in adjacent pairs (one contactor per pair of fan motors).
- Standard control circuits are 230 volts. 115 volt is available upon request.
- Control circuit branch fusing is included with all fan cycling options.
- A control circuit transformer is ordered separately as needed.
- All fan cycling options include a temperature sensor and electronic controller.

FLUID COOLERS

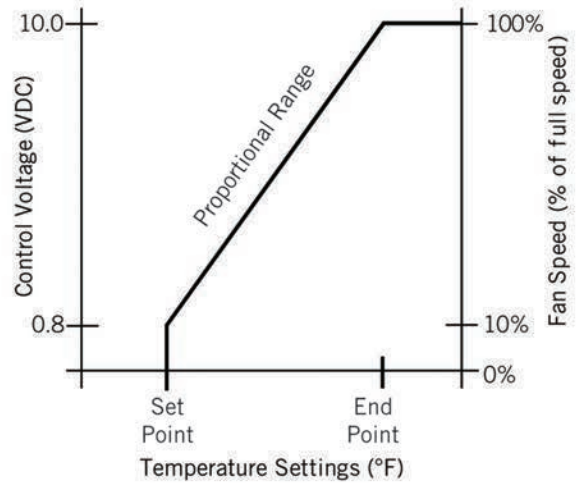
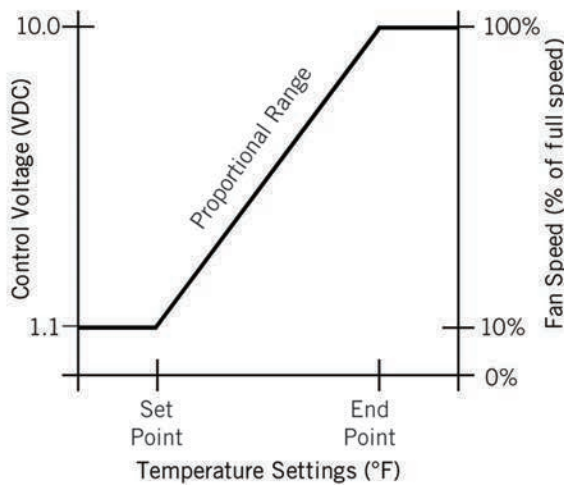
Variable Speed EC Fan Motors (VSEC)

VSEC fan motors offer the opportunity for ultra-high energy efficiency, extremely quiet operation, and precise leaving fluid temperature control. These three phase motors will operate in the range of 10% to 100% of their full speed rating in response to a 1 to 10 VDC proportional signal supplied by a temperature sensor and speed controller. Leaving fluid temperature is controlled by speeding up and slowing down the fans, causing air flow across the coil to increase and decrease..

Modine VSEC fan motors are controlled under the following specifications:

motor turns off	< 1.0 VDC
motor operates at 10% full speed	1.0 VDC
motor restarts after falling below 1.0 VDC signal	1.5 VDC
motor operates at 100% full speed	10.0 VDC

It is recommended that, when possible, header fan motors should run at a minimum of 10% of full speed any time the fluid pumps are running. Down stream fan motors may be allowed to turn off by letting the control signal to drop below 1.0 VDC.



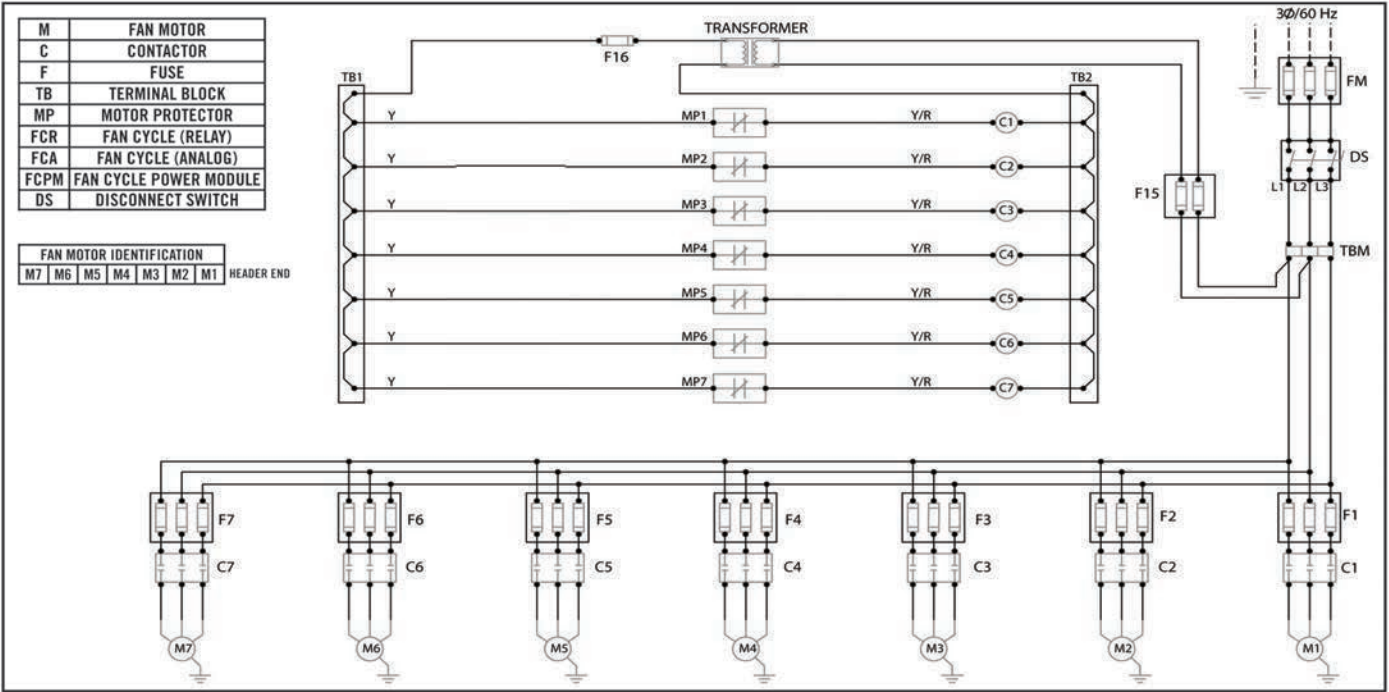
Variable speed EC fan motors are offered in two configurations – full VSEC and VSEC header fans. MFV models are equipped with all VSEC fan motors, providing the ultimate in control technology. All fans are ramped up and down in speed together. Header fans will operate at a minimum of 11% of full speed while downstream fans are allowed to cycle off.

MFS models are available with optional VSEC header fans where the remaining downstream fans are standard single speed fans that may be equipped with on/off fan cycling. As downstream fans cycle on/off, the VSEC header fan(s) ramp up/down in speed to more precisely control leaving fluid temperature. Header fans will always operate at a minimum 10% of full speed.

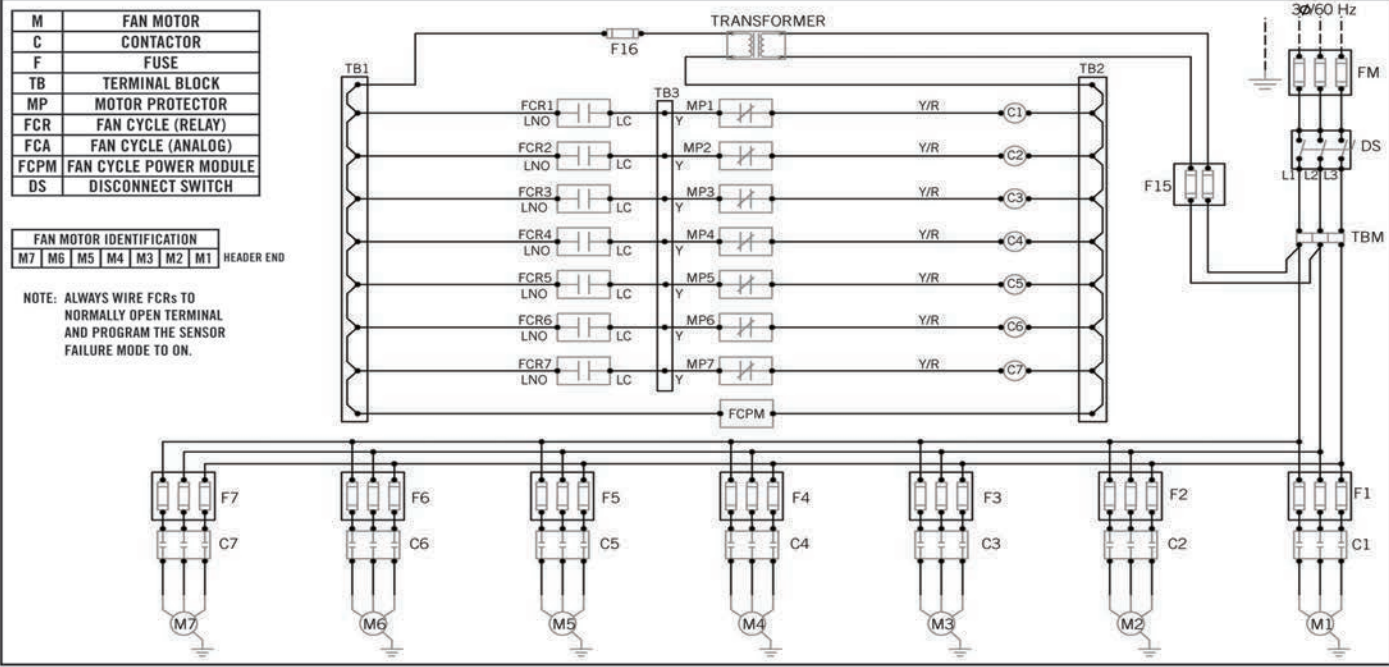
In addition to variable speed operation, Modine VSEC fan motors include many advanced technology features including inherent overheating protection, phase loss protection, over/under voltage protection, and rotation correction (regardless how they are wired, they always rotate the correct direction).

FLUID COOLERS

Typical Wiring Diagram with Individual Contractors



Typical Wiring Diagram with Individual Contractors and Fan Cycling Control



Typical Wiring Diagram with Variable Speed Header Fans, Fan Cycling and Speed Control





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