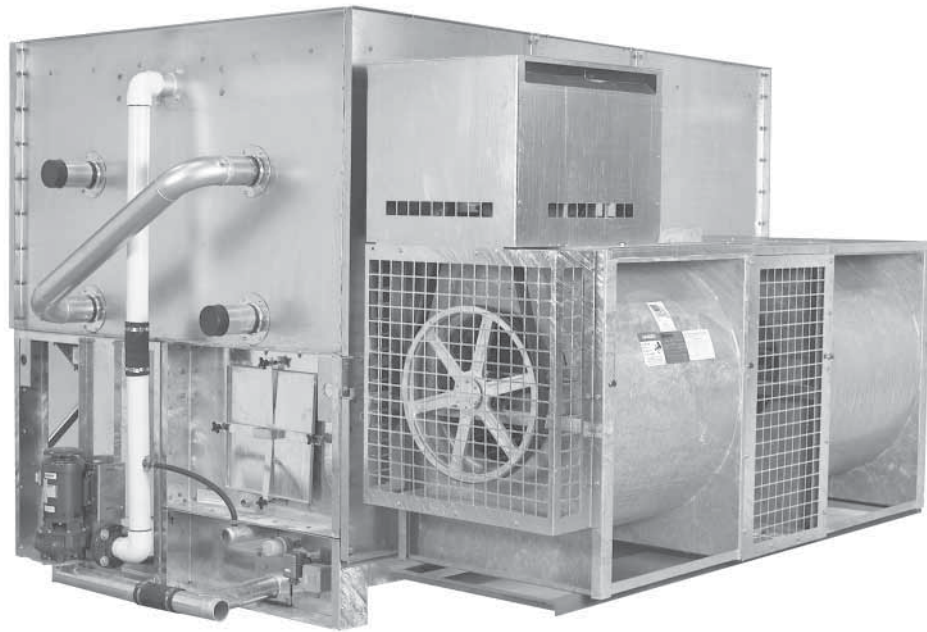


Imeco EFC/IDFC

EVAPORATIVE FLUID COOLERS

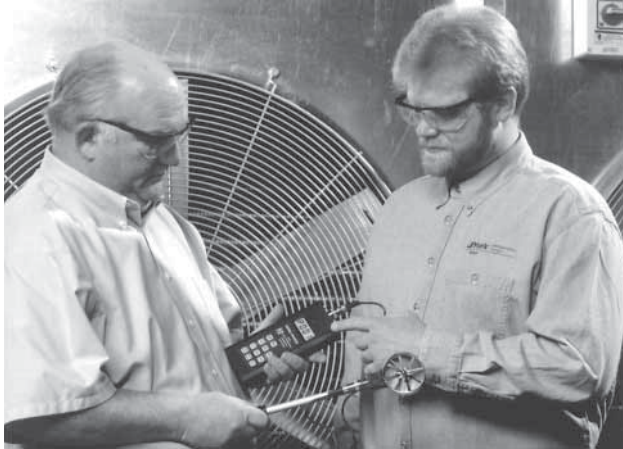
For Water or Water – Glycol Mixtures



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EFC EVAPORATIVE FLUID COOLERS



JOHNSON CONTROLS COMMITMENT TO QUALITY

Johnson Controls stands alone in offering the premium corrosion protection of Hot Dip Galvanized After Fabrication. As an option, all casing components and fan sections can be galvanized after fabrication. This provides maximum corrosion protection for all components.

Johnson Controls customers can now enjoy the added value provided by the first comprehensive computer software program designed to aid in faster, more accurate analysis and selection of cooling equipment. The program readily accesses information concerning performance, weight, size, and capacity, and is available for all product lines.

Johnson Control's experience and commitment to serving the needs of the cooling equipment markets have led to the development of the industry's broadest line of evaporators, evaporative condensers, and evaporative closed circuit fluid coolers.

OUTSTANDING ENERGY SAVING

The water saving, energy saving EFC evaporative fluid cooler will provide fast payback and many years of trouble-free service because of its proven performance and reliability. Once through water consumption costs are reduced by 95% because of the recirculating process of the EFC spray system.

The EFC can efficiently and economically cool many fluids that are chemically compatible with carbon steel to within 5°F of the wet bulb temperature. The closed circuit design of the EFC prevents the fluid being cooled from contacting the water spray and forced air. There is no danger of contaminating the fluid being cooled since it is at a pressure greater than atmospheric on the evaporative coolant side.

Johnson Controls offers in 228 models with a range of cooling capacities to choose from to precisely match your design load and operating requirements.

HOT DIP GALVANIZED AFTER FABRICATION THE JOHNSON CONTROLS ADVANTAGE

Hot Dip Galvanized After Fabrication is the most effective method of protection against corrosion. Applied by immersing fabricated articles in a bath of molten zinc, the galvanized coating is metallurgically bonded to the underlying steel and forms an impervious barrier between the steel and the corrosive environment. It does not adhere to the surface like paint; it becomes part of the surface. At the interface, the zinc and steel are combined into an iron-zinc alloy that will not peel away or crumble.

Hot Dip Galvanized After Fabrication corrosion protection withstands rough handling during shipping and erection. If small areas of the coating are mechanically damaged, the zinc on neighboring areas will protect the exposed steel from corrosion by sacrificial action. If the steel is only painted, under-film rust causes the paint to blister and peel away. Furthermore, because galvanizing is accomplished by total immersion, all parts of the steel fabrication become fully coated and protected, including areas that are inaccessible and hard to reach with paints.



COOLING COIL

EFC fluid coolers utilize ERW .060" wall tube coils to ensure long life. Coil circuits are staggered in the direction of the air flow to ensure optimal air turbulence and water coverage across the coil for maximized heat transfer performance. All circuits are adequately pitched to provide free and complete drainage.

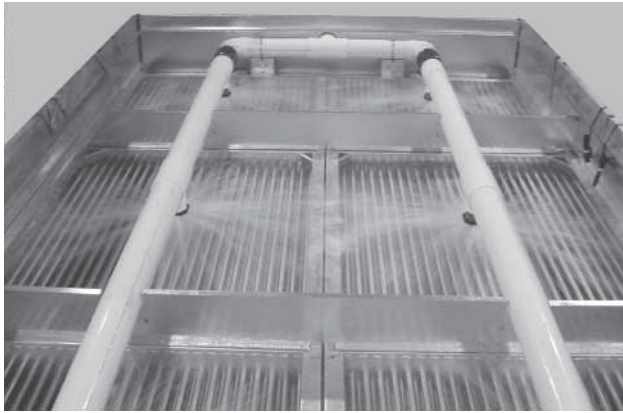
The cooling coil assembly is supported by a welded structural steel frame. The entire coil assembly including the framework is *Hot Dip Galvanized After Fabrication* to provide the best possible protection against corrosion.

The complete coil assembly is tested two times with 450 psig air pressure under water before and after galvanizing. This two-time testing procedure assures unquestionable coil integrity.

SPRAY ASSEMBLY

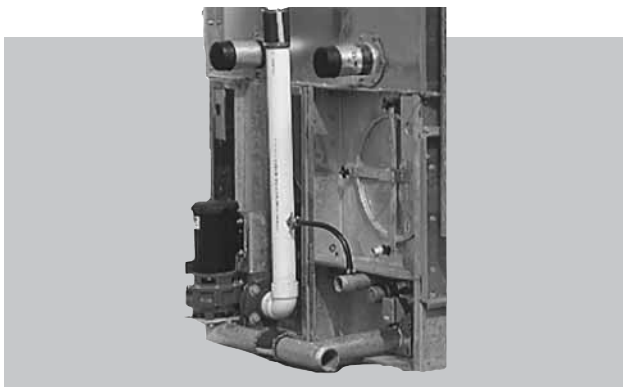
The EFC-C noncorroding PVC spray pipes provide complete and even water coverage from low pressure, closely spaced, nonclogging ABS spray nozzles. This efficient spray arrangement creates an overlapping spray pattern that gives excellent coverage throughout the coil, reducing scale formation under all operating conditions.

The EFC-P noncorroding PVC spray pipes provide complete and even water coverage from low pressure, large orifice, clog-resistant nozzles. This efficient spray system provides complete and continuous water coverage to maximize lifetime fluid cooler capacity, reducing scale formation under all operating conditions.



PUMP AND SPRAY PIPING

The spray water circulating pump is a close-coupled centrifugal unit with a ductile iron housing, closed impeller, mechanical seal, and is driven by a TEFC motor with a 1.15 service factor. The pump is mounted vertically under an all-weather hood to permit self draining and is completely piped, using schedule 40 PVC pipe, to the spray system inlet connection. The piping includes a bleed line with adjustable valve located between the pump discharge and overflow connection to meter the necessary water bleed-off.



MOISTURE ELIMINATORS

The EFC multiple break design eliminator provides very efficient removal of water droplets and mist from the air stream. These small, highly efficient eliminators can easily be removed for coil and spray assembly inspection.

The eliminators are constructed of noncorroding PVC for maximum protection against even the most corrosive atmospheres.

Optional, heavier duty moisture eliminators are available to increase eliminator life and withstand frequent handling without damage. Heavy-duty, bolted, PVC eliminators provide a lightweight, but durable alternative. The eliminator blade thickness is increased by a factor of 40. Eliminators are also available in steel, mounted in a heavy-gauge steel framework, *Hot Dip Galvanized After Fabrication*.

WATER PAN SECTION

The entire pan assembly is constructed of welded, heavy-gauge steel. The large circular-access opening on the pump end of the pan provides easy access for internal inspection and periodic maintenance. The brass float valve and the *Hot Dip Galvanized After Fabrication* strainer are conveniently located near the access opening for easy adjustment and cleaning.

FAN MOTOR

TEFC, ball-bearing motors with a 1.15 service factor are standard on all EFC fluid coolers. Fan motors are mounted on heavy duty frames and easily accessible for belt adjustment.

COIL CASING

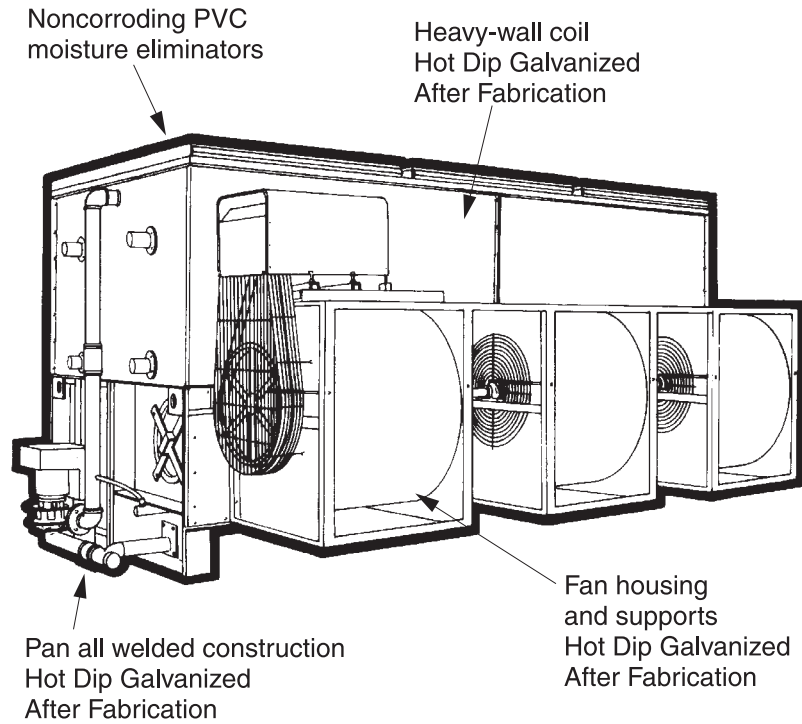
EFC coil casings are constructed of heavy-gauge galvanized steel. All casing panels are flanged. Internal structural members are used to provide added integrity. As an option, the entire casing is available *Hot Dip Galvanized After Fabrication* to provide the highest level of corrosion protection.

FACTORY TESTING

All EFC units are fabricated, assembled, and tested at the factory to ensure consistent high quality construction and performance before shipment. This ensures trouble-free installation and lasting service.

HIGH QUALITY FLUID COOLER COMPONENTS

- HEAVY-WALL STEEL COILS ARE *Hot Dip Galvanized After Fabrication*
- FAN HOUSING IS CONSTRUCTED OF HEAVY-GAUGE STEEL AND IS *Hot Dip Galvanized After Fabrication*
- PITCHED COIL FOR COMPLETE DRAINAGE
- STAGGERED TUBE COIL FOR MAXIMUM HEAT TRANSFER
- LARGE, SLOW SPEED FANS
- EASY BELT ADJUSTMENT
- SOLID BRASS FLOAT VALVE WITH PLASTIC FLOAT
- OVERSIZED STRAINER
- FULL COVERAGE, LARGE-ORIFICE, CLOG-REDUCING NOZZLE FOR CONTINUOUS SPRAY COVERAGE
- CONVENIENT EXTENDED LUBRICATION POINTS FOR SIMPLIFIED SERVICE



EFC-C SERIES CENTRIFUGAL FLUID COOLERS

The EFC-C series of evaporative fluid coolers utilize large diameter, forward curved centrifugal fans. Centrifugal fans are inherently quiet compared to axial fans and can operate against greater static pressures. Equipped with optional capacity control dampers, EFC-C evaporative fluid coolers are ideally suited for applications requiring close control of leaving fluid temperature.

During periods of low ambient wet bulb temperature or light loads, operating energy can be reduced by furnishing EFC-C evaporative fluid coolers with capacity control dampers, two-speed fan motors or optional pony-motor fan system. The pony-motor fan system utilizes two, single-speed fan motors and drive assemblies on either end of the fan shaft. One motor is sized for maximum performance and the other motor is sized for approximately 1/3 of the design horsepower and 2/3 of design fan speed. The motors operate independently and provide control similar to that achieved with a two-speed/two-winding fan motor, with the additional benefit of standby capacity.

FAN SECTION

All EFC-C fluid coolers use heavy duty, forward-curved centrifugal fans selected to operate at low rpm for long life, quiet operation. Fans are mounted on a steel shaft supported by oversized, self-aligning, heavy-duty ball bearings with extended lubrication points for easy service.

Fan wheels are constructed of heavy-gauge steel and are *Hot Dip Galvanized After Fabrication*. The fan housing is constructed of heavy-gauge steel. All fans and belt guards meet OSHA requirements.



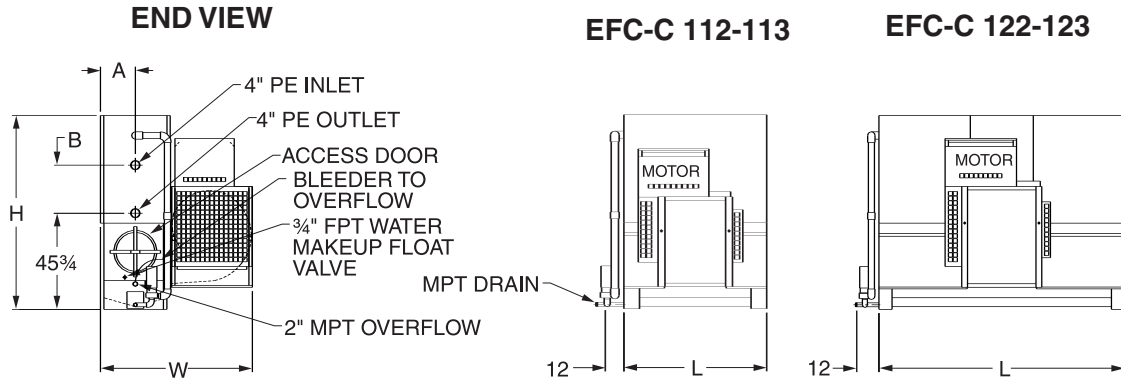
V-belt drives are designed for a minimum of 150% of the fan motor nameplate horsepower. Rugged motor bases are provided with conveniently located belt adjustment.

Motor covers provide complete protection against all weather conditions.

WATER PAN SECTION

The pan is constructed with heavy-gauge steel. All component parts are welded together to form a solid one-piece pan assembly.

EFC-C SERIES ENGINEERING DATA



EFC-C Model	CFM	Fan Motor HP ⁽¹⁾	Spray Water GPM ⁽²⁾	Pump Motor HP ⁽²⁾	Remote Sump			Dimensions (Inches)				Tube Coil Weights			HTR kW
					Water In	Sump Drain	Gal. ⁽³⁾ Req'd	Height H	Length L	Width W	Ctrs B	Unit ⁽⁴⁾ Shipp	Unit ⁽⁵⁾ Oprng	Hvst Sect.	
112-0	6,800	3	40	0.5	2.5-MPT	3-FPT	55	87.750	57	66.25	18.375	1,680	2,260	1,190	3.0
112-1	6,700	3	40	0.5	2.5-MPT	3-FPT	55	92.250	57	66.25	22.875	1,890	2,510	1,400	3.0
112-2	6,600	3	40	0.5	2.5-MPT	3-FPT	55	99.625	57	66.25	30.250	2,020	2,680	1,530	3.0
112-3	6,500	3	40	0.5	2.5-MPT	3-FPT	55	106.875	57	66.25	37.500	2,220	2,980	1,730	3.0
112-4	6,400	3	40	0.5	2.5-MPT	3-FPT	55	113.625	57	66.25	44.250	2,400	3,200	1,910	3.0
113-1	9,500	5	60	0.75	2.5-MPT	3-FPT	75	92.250	57	77.75	22.875	2,470	3,330	1,980	3.0
113-2	9,400	5	60	0.75	2.5-MPT	3-FPT	75	99.625	57	77.75	30.250	2,670	3,590	2,180	3.0
113-3	9,300	5	60	0.75	2.5-MPT	3-FPT	75	106.875	57	77.75	37.500	2,980	4,020	2,490	3.0
113-4	9,200	5	60	0.75	2.5-MPT	3-FPT	75	113.625	57	77.75	44.250	3,230	4,330	2,740	3.0
122-1	14,700	7.5	90	1	2.5-MPT	4-FPT	125	92.250	117	72.5	22.875	3,230	4,610	2,560	4.5
122-2	14,700	7.5	90	1	2.5-MPT	4-FPT	125	99.625	117	72.5	30.250	3,510	4,940	2,840	4.5
122-3	14,600	7.5	90	1	2.5-MPT	4-FPT	125	106.875	117	72.5	37.500	3,960	5,570	3,290	4.5
122-4	14,400	7.5	90	1	2.5-MPT	4-FPT	125	113.625	117	72.5	44.250	4,290	5,980	3,620	4.5
123-1	20,500	15	120	1.5	2.5-MPT	4-FPT	175	92.250	117	84	22.875	3,940	5,800	3,270	6.0
123-2	20,500	15	120	1.5	2.5-MPT	4-FPT	175	99.625	117	84	30.250	4,360	6,350	3,690	6.0
123-3	20,500	15	120	1.5	2.5-MPT	4-FPT	175	106.875	117	84	37.500	5,090	7,300	4,420	6.0
123-4	20,500	15	120	1.5	2.5-MPT	4-FPT	175	113.625	117	84	44.250	5,600	8,020	4,930	6.0

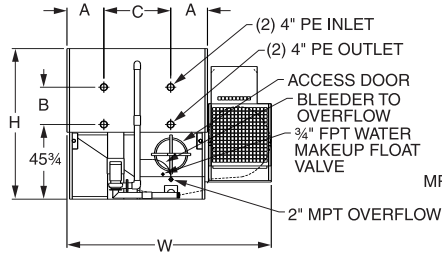
1. Fan motor HP is for free air delivery with 0" external static pressure.
2. Remote units are supplied less water-circulating pump(s), float valve(s), and related piping.
3. Values account for water in unit and piping—remote sump must also be sized for volume in field-erected spray distribution supply and drain pipes.
4. Shipping weights include water-circulating pumps.

5. Operating weights include water-circulating pump, water in the coils, and normal water operating level in the sump.

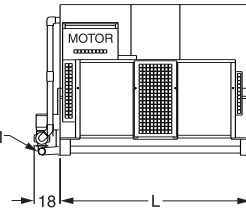
All data in this catalog is subject to change without notice. The standard right hand arrangement as shown has air inlet side on the right when facing coil connection end. Left hand arrangement can be furnished upon request.

Do not use for construction—product drawings available on request.

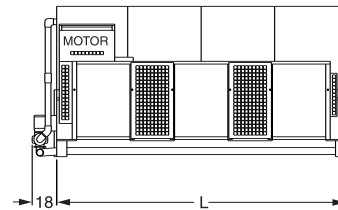
END VIEW



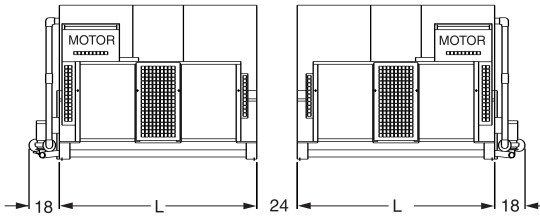
EFC-C 222-223



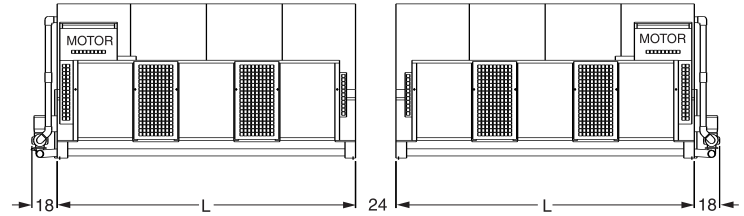
EFC-C 232-233



EFC-C 422-423



EFC-C 432-433



EFC-C Model	Fan Motor CFM	Spray Water HP ⁽¹⁾	Pump Motor GPM ⁽²⁾	Remote Sump Water In	Remote Sump Sump Drain	Remote Sump Gal. ⁽³⁾ Req'd	Dimensions (Inches)				Tube Coil Weights			HTR kW	
							Height H	Length L	Width W	Ctrs B	Unit ⁽⁴⁾ Shipp	Unit ⁽⁵⁾ Oprtng	Hvst Sect.		
222-1	29,400	15	180	1	3-MPT	4-FPT	135	92.250	117	102.5	22.875	5,710	7,620	4,430	4.5
222-2	29,400	15	180	1	3-MPT	4-FPT	135	99.625	117	102.5	30.250	6,320	8,410	5,040	4.5
222-3	29,400	15	180	1	3-MPT	4-FPT	135	106.875	117	102.5	37.500	7,260	9,660	5,980	4.5
222-4	29,400	15	180	1	3-MPT	4-FPT	135	113.625	117	102.5	44.250	7,810	10,270	6,530	4.5
223-1	40,700	20	240	1.5	3-MPT	5-FPT	190	92.250	117	125.5	22.875	6,890	9,530	5,610	6.0
223-2	40,500	20	240	1.5	3-MPT	5-FPT	190	99.625	117	125.5	30.250	7,740	10,640	6,460	6.0
223-3	40,200	20	240	1.5	3-MPT	5-FPT	190	106.875	117	125.5	37.500	8,950	12,280	7,670	6.0
223-4	40,050	20	240	1.5	3-MPT	5-FPT	190	113.625	117	125.5	44.250	10,000	13,770	8,720	6.0
232-2	44,400	20	270	2	3-MPT	4-FPT	215	99.625	177	102.5	30.250	9,550	12,490	7,380	7.5
232-3	44,000	20	270	2	3-MPT	4-FPT	215	106.875	177	102.5	37.500	10,820	14,050	8,650	7.5
232-4	43,400	20	270	2	3-MPT	4-FPT	215	113.625	177	102.5	44.250	11,960	15,470	9,790	7.5
233-1	61,500	30	370	3	3-MPT	6-FPT	295	92.250	177	125.5	22.875	10,140	14,170	7,970	9.0
233-2	61,100	30	370	3	3-MPT	6-FPT	295	99.625	177	125.5	30.250	11,430	15,860	9,260	9.0
233-3	60,900	30	370	3	3-MPT	6-FPT	295	106.875	177	125.5	37.500	13,170	18,260	11,000	9.0
233-4	60,500	30	370	3	3-MPT	6-FPT	295	113.625	177	125.5	44.250	14,740	20,100	12,570	9.0
422-1	58,800	(2)15	360	(2)1	(2)3-MPT	(2)4-FPT	270	92.250	117	102.5	22.875	11,420	15,230	(2)4,430	(2)4.5
422-2	58,800	(2)15	360	(2)1	(2)3-MPT	(2)4-FPT	270	99.625	117	102.5	30.250	12,640	16,830	(2)5,040	(2)4.5
422-3	58,800	(2)15	360	(2)1	(2)3-MPT	(2)4-FPT	270	106.875	117	102.5	37.500	14,520	19,320	(2)5,980	(2)4.5
422-4	58,800	(2)15	360	(2)1	(2)3-MPT	(2)4-FPT	270	113.625	117	102.5	44.250	15,610	20,530	(2)6,530	(2)4.5
423-1	81,400	(2)20	480	(2)1.5	(2)3-MPT	(2)5-FPT	380	99.625	117	125.5	22.875	13,790	19,070	(2)5,620	(2)6.0
423-2	81,000	(2)20	480	(2)1.5	(2)3-MPT	(2)5-FPT	380	99.625	117	125.5	30.250	15,490	21,290	(2)6,470	(2)6.0
423-3	80,000	(2)20	480	(2)1.5	(2)3-MPT	(2)5-FPT	380	106.875	117	125.5	37.500	17,910	24,570	(2)7,680	(2)6.0
423-4	80,100	(2)20	480	(2)1.5	(2)3-MPT	(2)5-FPT	380	113.625	117	125.5	44.250	19,990	27,530	(2)8,720	(2)6.0
432-2	44,400	(2)20	540	(2)2	(2)3-MPT	(2)4-FPT	430	99.625	177	102.5	30.250	19,100	24,980	(2)7,380	(2)7.5
432-3	44,000	(2)20	540	(2)2	(2)3-MPT	(2)4-FPT	430	106.875	177	102.5	37.500	21,660	28,110	(2)8,660	(2)7.5
432-4	43,400	(2)20	540	(2)2	(2)3-MPT	(2)4-FPT	430	113.625	177	102.5	44.250	23,920	30,940	(2)9,790	(2)7.5
433-1	123,000	(2)30	740	(2)3	(2)3-MPT	(2)6-FPT	590	92.250	177	125.5	22.875	20,290	28,350	(2)7,970	(2)9.0
433-2	122,200	(2)30	740	(2)3	(2)3-MPT	(2)6-FPT	590	99.625	177	125.5	30.250	22,850	31,700	(2)9,250	(2)9.0
433-3	121,800	(2)30	740	(2)3	(2)3-MPT	(2)6-FPT	590	106.875	177	125.5	37.500	26,340	36,520	(2)11,000	(2)9.0
433-4	121,000	(2)30	740	(2)3	(2)3-MPT	(2)6-FPT	590	113.625	177	125.5	44.250	29,490	41,000	(2)12,570	(2)9.0

Do not use for construction—product drawings available on request.
NOTE: See footnotes on page 6.

EFC-C OPTIONAL EQUIPMENT

DISCHARGE HOOD WITH POSITIVE CLOSURE DAMPERS

To reduce chimney effect heat losses from the cooler when idle, a discharge hood with positive closure dampers can be furnished. For installations where low cooler height is required, a low silhouette discharge hood with positive closure dampers is available. The low-silhouette damper assembly is designed for low air pressure drop and does not require an oversized fan motor.

A tapered discharge hood can be furnished, with positive-closure dampers, for installations where the height and velocity of the fluid cooler air discharge must be increased.

The dampers are operated by a two-position actuator and linkage. Actuator and linkage are factory installed. All wiring and actuator controls must be furnished by others. A 120 volt power supply is required. Damper actuator should be interlocked with the temperature control system so the dampers are open when the fans are running and closed when the fans are off.

Tapered discharge hood with dampers increases the static pressure on the fan and require the fan motor to be increased to the next larger size. **NOTE: Option adds 3 - 4 ft to unit height.**

AIR INLET DUCT ADAPTER

Air inlet duct adapter is required when the intake air is ducted to the unit fan section. The air inlet duct adapter is available on all EFC-C Fluid Coolers. When air inlet duct adapters are utilized, all bearing lube lines are extended to facilitate maintenance from outside of the duct.

ELECTRIC PAN WATER LEVEL CONTROL

For installations where very close control of the pan water is required, an electric water level system can be provided that consists of a weather-protected electric float switch mounted on the pan section and weather-protected solenoid valve mounted on the water makeup connection. The float switch and solenoid valve are factory wired to a NEMA 4 junction box.

PAN HEATER(S)

To prevent freeze-up of water in the pan when the unit is idle, electric immersion heater(s) can be furnished and installed in the pan.

The electric immersion heater is a stainless steel sheath type that is controlled by a thermostat that senses the pan water temperature and a low water cutout switch that prevents operation of the heater if the water level in the pan is insufficient. The heater will maintain the pan water at 40°F when the ambient is -10°F with a 45 mph wind, and the unit is not operating.

COIL-CASING INSULATION

To reduce heat loss from the cooler, insulation can be furnished and installed on the casing of the cooler.

The insulation consists of a one inch layer of Armaflex that is glued to the casing and is covered by a protective paint coating. For maximum reduction of heat loss from the idle cooler, the insulation should be used in conjunction with positive-closure discharge dampers. All Factory discharge hoods may be furnished with insulation to minimize losses.

VIBRATION ISOLATORS

Where building codes require vibration isolation, spring-type vibration isolators can be furnished to properly isolate the equipment from the mounting structure.

HOT DIP GALVANIZED AFTER FABRICATION

For the most effective method of corrosion protection all casing material for the pan section, fan section, and coil section can be provided using *Hot Dip Galvanized After Fabrication* components.

CAPACITY CONTROL

To maintain system leaving water temperatures during low ambient temperatures or in systems with widely fluctuating loads, several types of capacity control systems are offered:

MODULATING DAMPERS

On the EFC centrifugal fluid coolers, modulating dampers can be mounted in the discharge throat of each fan. These dampers consist of galvanized steel blades mounted on a common steel shaft and are controlled by a modulating damper actuator that is mounted on the fan casing with the appropriate interconnecting linkage. A temperature-sensing controller is furnished for mounting in the leaving fluid line to the unit.

The damper actuator is designed to close the dampers if the unit is turned off or power is lost, and also contains an end switch that can be used to turn off the fan motor when the dampers close.

TWO-SPEED FAN MOTORS

On all EFC fluid coolers, two-speed fan motors are available and one step of capacity reduction by reducing the fan speed. These motors are available with either single or dual windings.

PONY MOTOR DRIVE PACKAGE

A complete line of Pony Motor Drive Packages is available for use on all model EFC-C Evaporative Fluid Coolers. The Pony Motor fan system utilizes two single-speed fan motors and drive assemblies on either end of the fan shaft. The Pony Motor is sized for approximately 1/3 of the design HP. The motors operate independently and provide control similar to that achieved with a two-speed/two-winding fan motor with the additional benefit of standby capacity.

SOUND ATTENUATION

EFC centrifugal fluid coolers will meet most sound level criteria without acoustical treatment. For extremely noise-sensitive installations, EFC-C units can be provided with factory-assembled sound attenuators for field mounting.

Contact your local Johnson Controls sales representative or the factory for complete details. **NOTE: Option adds 6 - 8 ft to unit height.**

COIL CONNECTIONS

Our evaporative fluid coolers can be supplied with MPT, Victaulic groove, flanged, or copper sweat coil connections when required.

Contact your local Johnson Controls sales representative or the factory for complete details.

CONTROL PANEL

To minimize design engineering and field wiring, single-point electrical connections are offered with all the necessary components in a control panel. Panels include: main disconnect(s), individual fusing of all major components, motor starters with 3-phase overload protection, 120 volt single-phase control voltage transformer, Hand-Off-Auto switch for both manual and automatic startups, terminal strip with custom wiring for stage controllers, and a NEMA-4 enclosure.

Contact your local sales representative or the factory for your specific design applications.

EFC-C SERIES RIGGING AND FOUNDATION LAYOUT

ASSEMBLY INSTRUCTIONS:

Step 1

Take mastic from parts box and place mastic on coil section as shown.

Step 2

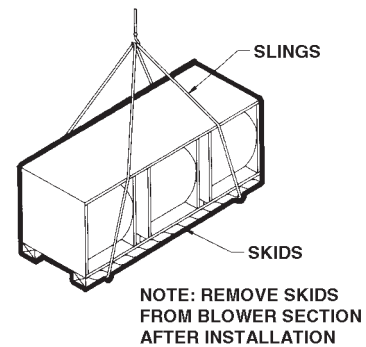
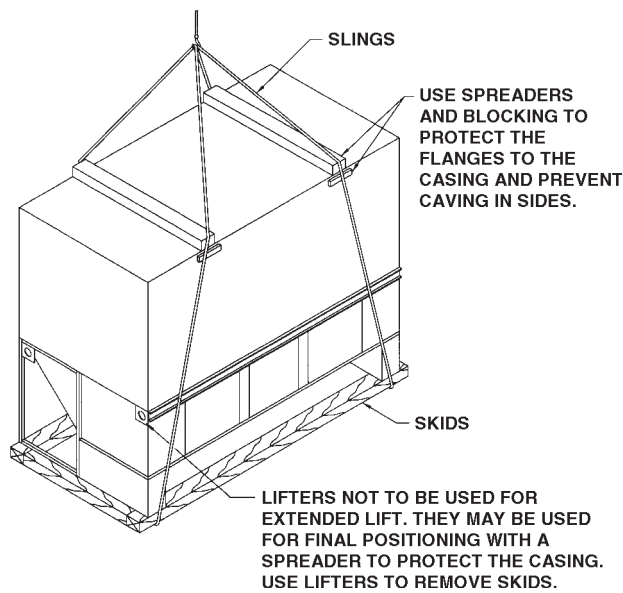
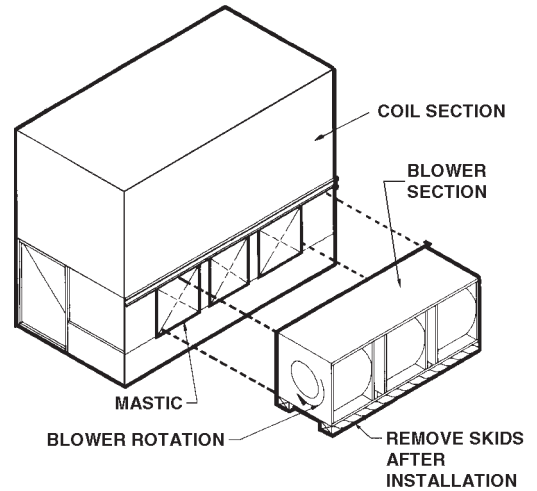
Lower blower section to unit body so that the support on the blower section rests on the flanged edge of the top mounting panel on the unit body. Move the blower section to the coil section until all mounting flanges are touching.

Step 3

On each blower, install bolts with a flat washer under both the bolt and nut.

Step 4

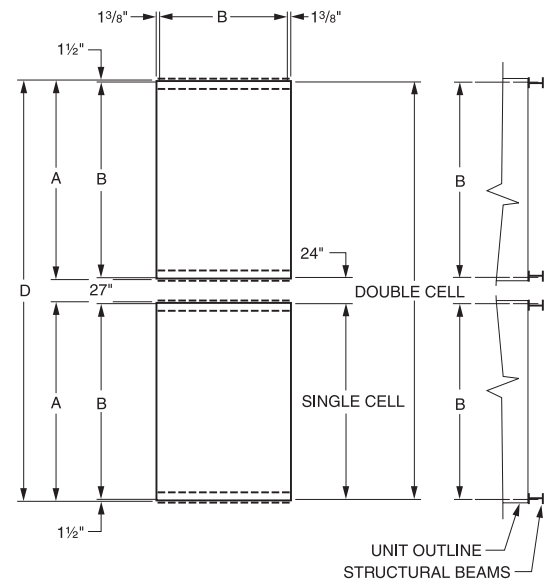
TIGHTEN ALL BOLTS CONNECTING BLOWER SECTION TO UNIT BODY BEFORE REMOVING RIGGING.



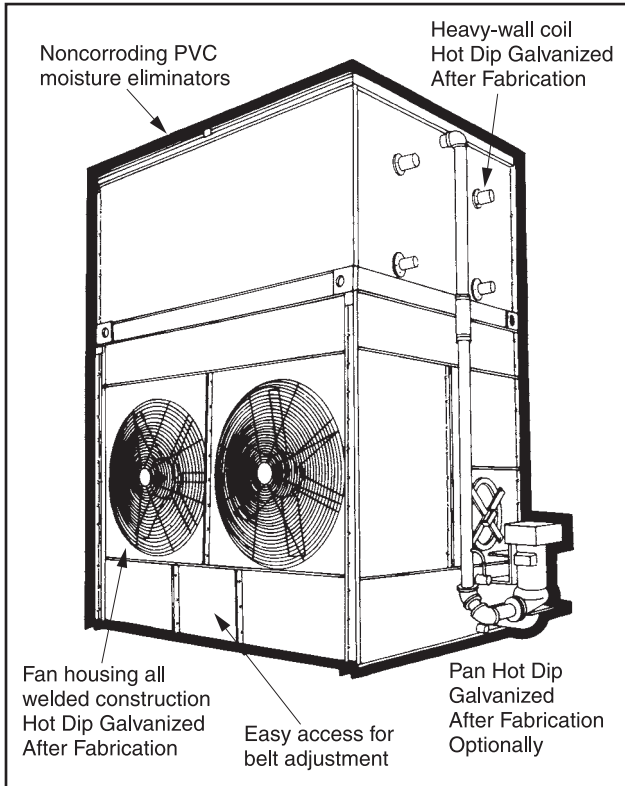
EFC-C - CENTRIFUGAL PLATFORM LAYOUT

Model #s	A	B	C	D
EFC-C 112-0 through EFC-C 112-4	57	54	27.25	—
EFC-C 113-1 through EFC-C 113-4	57	54	38.75	—
EFC-C 122-1 through EFC-C 122-4	117	114	27.25	—
EFC-C 123-1 through EFC-C 123-4	117	117	38.75	—
EFC-C 222-1 through EFC-C 222-4	117	114	57.25	—
EFC-C 223-1 through EFC-C 223-4	117	114	80.25	—
EFC-C 232-2 through EFC-C 232-4	177	174	57.25	—
EFC-C 233-1 through EFC-C 233-4	177	174	80.25	—
EFC-C 422-1 through EFC-C 422-4	117	114	57.25	258
EFC-C 423-1 through EFC-C 423-4	117	114	80.25	258
EFC-C 432-2 through EFC-C 432-4	177	174	57.25	378
EFC-C 433-1 through EFC-C 433-4	177	174	80.25	378

NOTE: Beams and/or piers should be sized in accordance with standard engineering practices. Beam deflection should not exceed 1/360 of span, not to exceed 1/2 inch.



EFC-P SERIES PROPELLER FAN FLUID COOLERS



The vane-axial series of evaporative fluid coolers utilize two-stage axial-flow fans mounted in a close fitting fan cylinder. Discharge guide vanes at the outlet of the first stage fan minimize pre-rotation of the air into the second stage fan and further maximize fan efficiency. Vane axial evaporative fluid coolers operate with low fan horsepower-providing the required cooling capacity with as low as 50% of the fan horsepower of comparable sized centrifugal fan units. The multistage fan design also has the additional benefit of operating at rotative and fan tip speeds slower than most conventional single stage axial fans, providing acceptable sound levels for most industrial applications.

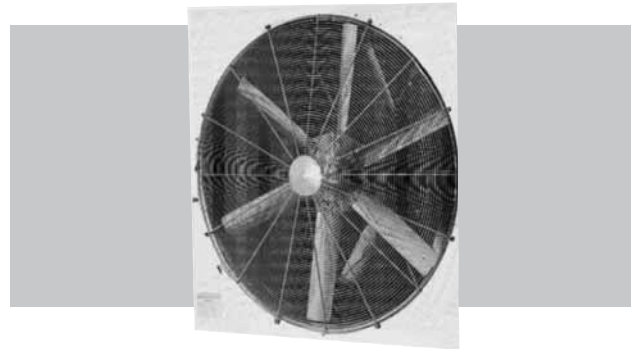
Vane-axial evaporative fluid coolers are ideal for unrestricted, open installations which do not require external static pressure capability, extremely low sound levels or leaving fluid temperature control more accurate than that provided by fan cycling. They satisfy the requirements of most fluid cooling applications with low energy consumption.

FAN SECTION

All vane-axial evaporative fluid coolers use two-stage, heavy-duty cast aluminum vane axial fans mounted in a fan orifice tube with air guides mounted between the first- and second-stage fans to straighten the air between the fans, improving fan performance. The fans are designed to run at low rpm to reduce wear and noise.

Fan shafts are supported by heavy duty, self-aligning ball bearings with locking collar. Bearings are conservatively sized for long life. Bearing lubrication is accomplished with lube lines extended to the outside casing. Fan housing, including orifice panel, tube, and vanes, are all welded together to form a superior assembly that is of heavy-gauge steel.

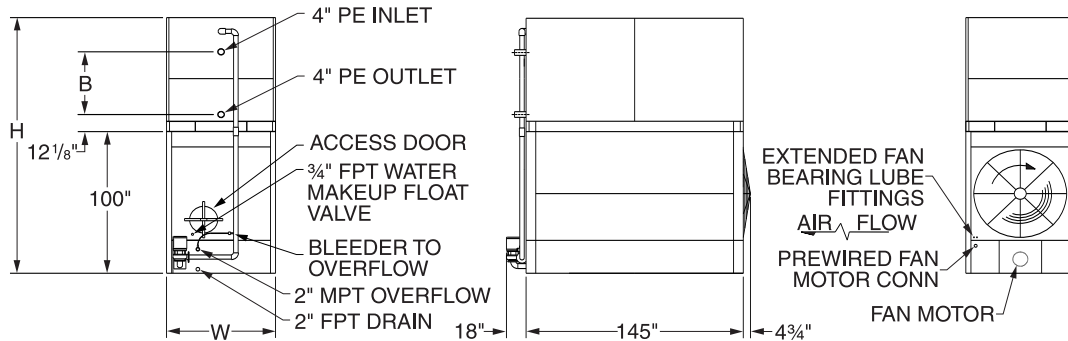
A convex-shaped, heavy-duty *Hot Dip Galvanized After Fabrication* fan guard protects the fans during operation. The guards can be easily removed for access to fans, shafts and bearings. V-belt drives are designed for a minimum 150% of the fan motor nameplate horsepower. Motors are mounted on a heavy-duty base designed for easy accessibility for belt adjustment. The solid orifice panels and lower casings protect the motor(s) from the weather. Fan motors are prewired to the outside of the casing.



EFC-P SERIES ENGINEERING DATA

END VIEW

S90 – S270



EFC-P

EFC-P Model	Fan Motor CFM	Spray Water HP ⁽¹⁾	GPM ⁽²⁾	Pump Motor HP ⁽²⁾	Remote Sump			Dimensions (Inches)				Tube Coil Weights			HTR kW
					Water In	Sump Drain	Gal. ⁽³⁾ Req'd	Height H	Length L	Width W	Ctrs B	Unit ⁽⁴⁾ Shipp	Unit ⁽⁵⁾ Oprtng	Hvst Sect.	
S90	17,620	1.5	200	1.5	3-MPT	6-PE	120	159.12	145	61.75	22.87	5,220	9,136	3,170	7.5
S100	21,680	3	200	1.5	3-MPT	6-PE	120	159.12	145	61.75	22.87	5,230	9,146	3,170	7.5
S110	25,460	5	200	1.5	3-MPT	6-PE	120	159.12	145	61.75	22.87	5,245	9,161	3,170	7.5
S115	21,180	3	200	1.5	3-MPT	6-PE	120	166.25	145	61.75	30.25	5,490	9,624	3,430	7.5
S120	28,400	7.5	200	1.5	3-MPT	6-PE	120	159.12	145	61.75	22.87	5,270	9,186	3,170	7.5
S125	20,780	3	200	1.5	3-MPT	6-PE	120	173.50	145	61.75	37.50	6,580	10,932	4,520	7.5
S130	25,030	5	200	1.5	3-MPT	6-PE	120	166.25	145	61.75	30.25	5,505	9,639	3,430	7.5
S135	23,650	3	240	2	3-MPT	6-PE	120	166.25	145	61.75	30.25	6,610	10,999	4,550	7.5
S140	28,880	7.5	200	1.5	3-MPT	6-PE	120	166.25	145	61.75	30.25	5,530	9,664	3,430	7.5
S145	24,560	5	200	1.5	3-MPT	6-PE	120	173.50	145	61.75	37.50	6,595	10,947	4,520	7.5
S150	27,950	5	240	2	3-MPT	6-PE	120	166.25	145	61.75	30.25	6,625	11,014	4,550	7.5
S155	23,690	5	200	1.5	3-MPT	6-PE	120	180.25	145	61.75	44.25	7,375	11,939	5,300	7.5
S160	28,350	7.5	200	1.5	3-MPT	6-PE	120	173.50	145	61.75	37.50	6,620	10,972	4,520	7.5
S165	32,250	7.5	240	2	3-MPT	6-PE	120	166.25	145	61.75	30.25	6,650	11,039	4,550	7.5
S170	27,330	7.5	200	1.5	3-MPT	6-PE	120	180.25	145	61.75	44.25	7,760	12,110	5,660	7.5
S175	34,380	10	240	2	3-MPT	6-PE	120	166.25	145	61.75	30.25	6,670	11,059	4,550	7.5
S180	33,350	5	300	3	4-MPT	8-PE	150	166.25	145	72.75	30.25	7,975	13,293	5,800	9.0
S185	31,700	7.5	240	2	3-MPT	6-PE	120	173.50	145	61.75	37.50	7,680	12,334	5,480	7.5
S190	30,120	7.5	240	2	3-MPT	6-PE	120	180.25	145	61.75	44.25	8,560	13,476	6,360	7.5
S195	37,510	7.5	300	3	4-MPT	8-PE	150	166.25	145	72.75	30.25	8,000	13,318	5,800	9.0
S200	34,870	10	240	2	3-MPT	6-PE	120	173.50	145	61.75	37.50	7,700	12,354	5,480	7.5
S205	33,130	10	240	2	3-MPT	6-PE	120	180.25	145	61.75	44.25	8,580	13,496	6,360	7.5
S210	41,670	10	300	3	4-MPT	8-PE	150	166.25	145	72.75	30.25	8,020	13,338	5,800	9.0
S220	36,170	7.5	300	3	4-MPT	8-PE	150	173.50	145	72.75	37.50	8,850	14,493	6,650	9.0
S230	40,180	10	300	3	4-MPT	8-PE	150	173.50	145	72.75	37.50	8,870	14,513	6,650	9.0
S240	42,900	15	300	3	4-MPT	8-PE	150	173.50	145	72.75	37.50	8,880	14,523	6,650	9.0
S250	39,480	10	300	3	4-MPT	8-PE	150	180.25	145	72.75	44.25	9,930	15,900	7,710	9.0
S270	43,480	15	300	3	4-MPT	8-PE	150	180.25	145	72.75	44.25	9,940	15,910	7,890	9.0

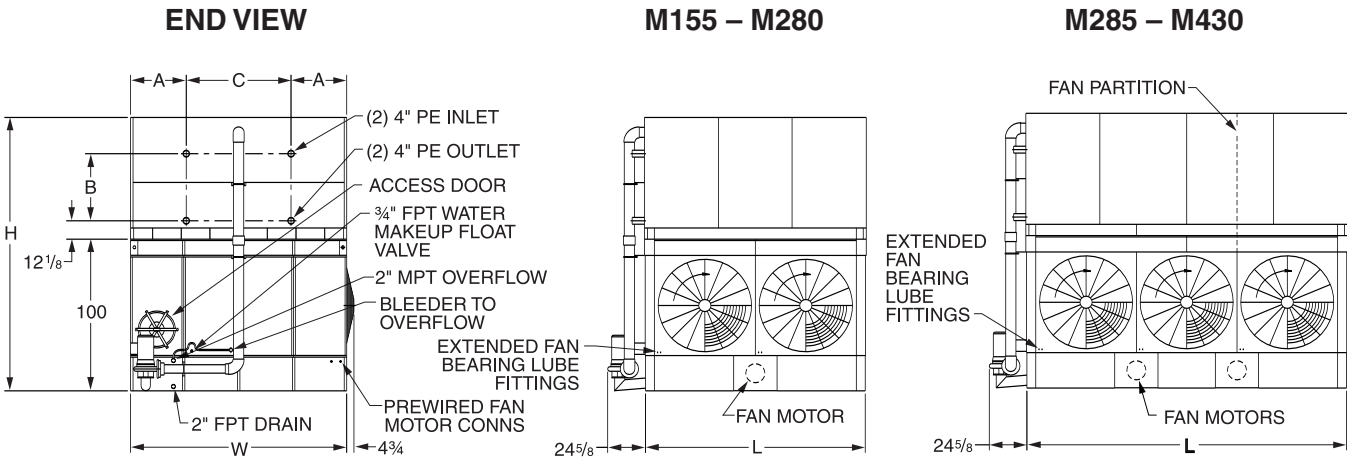
1. Fan motor HP is for free air delivery with 0" external static pressure.
2. Remote units are supplied less water-circulating pump(s), float valve(s), and related piping.
3. Values account for water in unit and piping—remote sump must also be sized for volume in field-erected spray distribution supply and drain pipes.

4. Shipping weights include water-circulating pumps.
5. Operating weights include water-circulating pump, water in the coils, and normal water operating level in the sump.

All data in this catalog is subject to change without notice.

Do not use for construction—product drawings available on request.

EFC-P



EFC-P Model	Fan Motor CFM	Fan Motor HP ⁽¹⁾	Spray Water GPM ⁽²⁾	Pump Motor HP ⁽²⁾	Remote Sump			Dimensions (Inches)				Tube Coil Weights			HTR kW
					Water In	Sump Drain	Gal. ⁽³⁾ Req'd	Height H	Length L	Width W	Ctrs B	Unit ⁽⁴⁾ Shipp	Unit ⁽⁵⁾ Oprtng	Hvst Sect.	
M155	32,060	3	325	3	4-MPT	8-PE	190	159.12	121.875	96.25	22.87	7,900	12,874	5,100	9.0
M170	37,380	5	325	3	4-MPT	8-PE	190	159.12	121.875	96.25	22.87	8,000	12,974	5,100	9.0
M185	31,460	3	325	3	4-MPT	8-PE	190	166.25	121.875	96.25	30.25	8,930	14,270	6,130	9.0
M190	42,780	7.5	325	3	4-MPT	8-PE	190	159.12	121.875	96.25	22.87	8,050	13,024	5,100	9.0
M195	47,080	10	325	3	4-MPT	8-PE	190	159.12	121.875	96.25	22.87	8,150	13,124	5,100	9.0
M200	30,540	3	325	3	4-MPT	8-PE	190	173.50	121.875	96.25	37.50	10,210	15,916	7,410	9.0
M205	36,690	5	325	3	4-MPT	8-PE	190	166.25	121.875	96.25	30.25	9,030	14,370	6,130	9.0
M210	29,580	3	325	3	4-MPT	8-PE	190	180.25	121.875	96.25	44.25	11,400	17,472	8,600	9.0
M220	41,920	7.5	325	3	4-MPT	8-PE	190	166.25	121.875	96.25	30.25	9,080	14,420	6,130	9.0
M225	35,620	5	325	3	4-MPT	8-PE	190	173.50	121.875	96.25	37.50	10,310	16,016	7,410	9.0
M235	34,500	5	325	3	4-MPT	8-PE	190	180.25	121.875	96.25	44.25	11,500	17,572	8,600	9.0
M240	47,220	10	325	3	4-MPT	8-PE	190	166.25	121.875	96.25	30.25	9,180	14,520	6,130	9.0
M245	40,700	7.5	325	3	4-MPT	8-PE	190	173.50	121.875	96.25	37.50	10,360	16,066	7,410	9.0
M260	39,410	7.5	325	3	4-MPT	8-PE	190	180.25	121.875	96.25	44.25	11,550	17,622	8,600	9.0
M270	45,850	10	325	3	4-MPT	8-PE	190	173.50	121.875	96.25	37.50	10,460	16,166	7,410	9.0
M280	44,400	10	325	3	4-MPT	8-PE	190	180.25	121.875	96.25	44.25	11,650	17,722	8,600	9.0
M285	48,200	3 & 1.5	450	5	4-MPT	8-PE	280	166.25	177	96.25	30.25	13,080	20,918	8,780	12.0
M305	46,800	3 & 1.5	450	5	4-MPT	8-PE	280	173.50	177	96.25	37.50	15,030	23,400	10,730	12.0
M310	56,210	5 & 3	450	5	4-MPT	8-PE	280	166.25	177	96.25	30.25	13,180	21,018	8,780	12.0
M320	45,320	3 & 1.5	450	5	4-MPT	8-PE	280	180.25	177	96.25	44.25	16,830	25,731	12,530	12.0
M335	54,580	5 & 3	450	5	4-MPT	8-PE	280	173.50	177	96.25	37.50	15,130	23,500	10,730	12.0
M340	64,530	7.5 & 5	450	5	4-MPT	8-PE	280	166.25	177	96.25	30.25	13,230	21,068	8,780	12.0
M355	52,850	5 & 3	450	5	4-MPT	8-PE	280	180.25	177	96.25	44.25	16,930	25,831	12,530	12.0
M360	69,640	10 & 5	450	5	4-MPT	8-PE	280	166.25	177	96.25	30.25	13,330	21,168	8,780	12.0
M370	62,360	7.5 & 5	450	5	4-MPT	8-PE	280	173.50	177	96.25	37.50	15,180	23,550	10,730	12.0
M395	60,390	7.5 & 5	450	5	4-MPT	8-PE	280	180.25	177	96.25	44.25	16,980	25,881	12,530	12.0
M405	70,240	10 & 5	450	5	4-MPT	8-PE	280	173.50	177	96.25	37.50	15,280	23,650	10,730	12.0
M430	68,020	10 & 5	450	5	4-MPT	8-PE	280	180.25	177	96.25	44.25	17,080	25,981	12,530	12.0
M810-2*	140,480	(2)10&(2)5	900	(2)5	(2)4-MPT	(2)8-PE	560	173.50	378	96.25	37.50	30,540	47,279	(2)10,720	(2)12.0
M860-2*	136,040	(2)10&(2)5	900	(2)5	(2)4-MPT	(2)8-PE	560	180.25	378	96.25	44.25	34,170	51,972	(2)12,535	(2)12.0

1. Fan motor HP is for free air delivery with 0" external static pressure.
2. Remote units are supplied less water-circulating pump(s), float valve(s), and related piping.
3. Values account for water in unit and piping—remote sump must also be sized for volume in field-erected spray distribution supply and drain pipes.

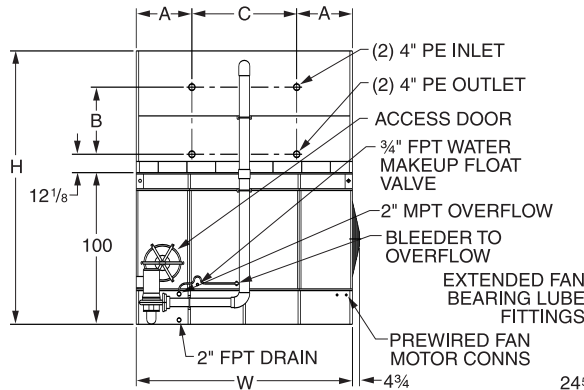
4. Shipping weights include water-circulating pumps.
5. Operating weights include water-circulating pump, water in the coils, and normal water operating level in the sump.

All data in this catalog is subject to change without notice. The standard right hand arrangement as shown has air inlet side on the right when facing coil connection end. Left hand arrangement can be furnished upon request.

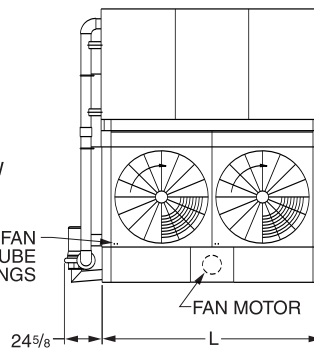
Do not use for construction—product drawings available on request.

* Dual-cell units are not shown in cut sheet drawings above. Single-cell base model numbers are one half of the dual-cell model number.

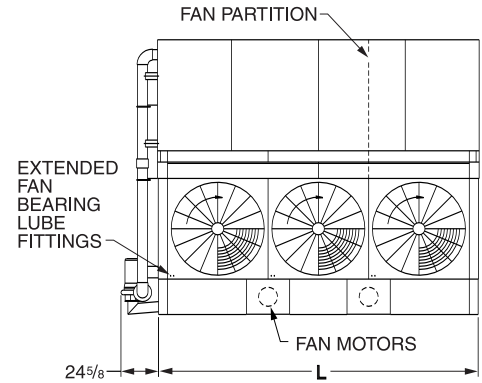
END VIEW



ML235 – ML345



ML350 – ML520



EFC-P

EFC-P Model	Fan Motor CFM	Fan Motor HP ⁽¹⁾	Spray Water GPM ⁽²⁾	Pump Motor HP ⁽²⁾	Remote Sump			Dimensions (Inches)				Tube Coil Weights			HTR kW
					Water In	Sump Drain	Gal. ⁽³⁾ Req'd	Height H	Length L	Width W	Ctrs B	Unit ⁽⁴⁾ Shipp	Unit ⁽⁵⁾ Oprtng	Hvst Sect.	
ML235	41,950	5	400	3	4-MPT	8-PE	230	166.25	145	96.25	30.25	10,330	16,757	7,230	12.0
ML260	40,490	5	400	3	4-MPT	8-PE	230	173.50	145	96.25	37.50	11,910	18,772	8,810	12.0
ML265	48,670	7.5	400	3	4-MPT	8-PE	230	166.25	145	96.25	30.25	10,430	16,857	7,230	12.0
ML270	39,270	5	400	3	4-MPT	8-PE	230	180.25	145	96.25	44.25	13,390	20,687	10,290	12.0
ML280	53,050	10	400	3	4-MPT	8-PE	230	166.25	145	96.25	30.25	10,480	16,907	7,230	12.0
ML290	46,970	7.5	400	3	4-MPT	8-PE	230	173.50	145	96.25	37.50	12,010	18,872	8,810	12.0
ML295	57,430	15	400	3	4-MPT	8-PE	230	166.25	145	96.25	30.25	10,580	17,007	7,230	12.0
ML300	45,550	7.5	400	3	4-MPT	8-PE	230	180.25	145	96.25	44.25	13,490	20,787	10,290	12.0
ML305	51,200	10	400	3	4-MPT	8-PE	230	173.50	145	96.25	37.50	12,060	18,922	8,810	12.0
ML320	49,750	10	400	3	4-MPT	8-PE	230	180.25	145	96.25	44.25	13,540	20,837	10,290	12.0
ML330	57,580	15	400	3	4-MPT	8-PE	230	173.50	145	96.25	37.50	12,160	19,022	8,810	12.0
ML345	55,850	15	400	3	4-MPT	8-PE	230	180.25	145	96.25	44.25	13,640	20,937	10,290	12.0
ML350	61,670	5 & 3	575	5	4-MPT	8-PE	340	166.25	211	96.25	30.25	15,390	24,841	10,490	15.0
ML380	59,620	5 & 3	575	5	4-MPT	8-PE	340	173.50	211	96.25	37.50	17,690	27,775	12,790	15.0
ML385	71,540	7.5 & 5	575	5	4-MPT	8-PE	340	166.25	211	96.25	30.25	15,490	24,941	10,490	15.0
ML395	57,820	5 & 3	575	5	4-MPT	8-PE	340	180.25	211	96.25	44.25	19,840	30,558	14,940	15.0
ML410	77,980	10 & 5	575	5	4-MPT	8-PE	340	166.25	211	96.25	30.25	15,540	24,991	10,490	15.0
ML425	69,160	7.5 & 5	575	5	4-MPT	8-PE	340	173.50	211	96.25	37.50	17,790	27,875	12,790	15.0
ML430	84,420	15 & 7.5	575	5	4-MPT	8-PE	340	166.25	211	96.25	30.25	15,640	25,091	10,490	15.0
ML445	67,080	7.5 & 5	575	5	4-MPT	8-PE	340	180.25	211	96.25	44.25	19,940	30,658	14,940	15.0
ML450	75,400	10 & 5	575	5	4-MPT	8-PE	340	173.50	211	96.25	37.50	17,840	27,925	12,790	15.0
ML475	73,110	10 & 5	575	5	4-MPT	8-PE	340	180.25	211	96.25	44.25	19,990	30,708	14,940	15.0
ML490	84,790	15 & 7.5	575	5	4-MPT	8-PE	340	173.50	211	96.25	37.50	17,940	28,025	12,790	15.0
ML520	82,230	15 & 7.5	575	5	4-MPT	8-PE	340	180.25	211	96.25	44.25	20,090	30,808	14,940	15.0
ML820-2*	155,960	(2)10&(2)5	1150	(2)5	(2)4-MPT	(2)8-PE	680	166.25	446	96.25	30.25	31,090	49,992	(2)10,495	(2)15.0
ML850-2*	138,320	(2)7.5&(2)5	1150	(2)5	(2)4-MPT	(2)8-PE	680	173.50	446	96.25	37.50	35,580	55,749	(2)12,790	(2)15.0
ML860-2*	168,840	(2)15&(2)7.5	1150	(2)5	(2)4-MPT	(2)8-PE	680	166.25	446	96.25	30.25	31,290	50,192	(2)10,495	(2)15.0
ML890-2*	134,160	(2)7.5&(2)5	1150	(2)5	(2)4-MPT	(2)8-PE	680	180.25	446	96.25	44.25	39,860	61,296	(2)14,930	(2)15.0
ML900-2*	150,800	(2)10&(2)5	1150	(2)5	(2)4-MPT	(2)8-PE	680	173.50	446	96.25	37.50	35,680	55,849	(2)12,790	(2)15.0
ML950-2*	146,220	(2)10&(2)5	1150	(2)5	(2)4-MPT	(2)8-PE	680	180.25	446	96.25	44.25	39,960	61,396	(2)14,930	(2)15.0
ML980-2*	169,580	(2)15&(2)7.5	1150	(2)5	(2)4-MPT	(2)8-PE	680	173.50	446	96.25	37.50	35,880	56,049	(2)12,790	(2)15.0
ML1040-2*	164,460	(2)15&(2)7.5	1150	(2)5	(2)4-MPT	(2)8-PE	680	180.25	446	96.25	44.25	40,160	61,596	(2)14,930	(2)15.0

1. Fan motor HP is for free air delivery with 0" external static pressure.
2. Remote units are supplied less water-circulating pump(s), float valve(s), and related piping.
3. Values are amount for water in unit and piping—remote sump must also be sized for volume in field-erected spray distribution supply and drain pipes.

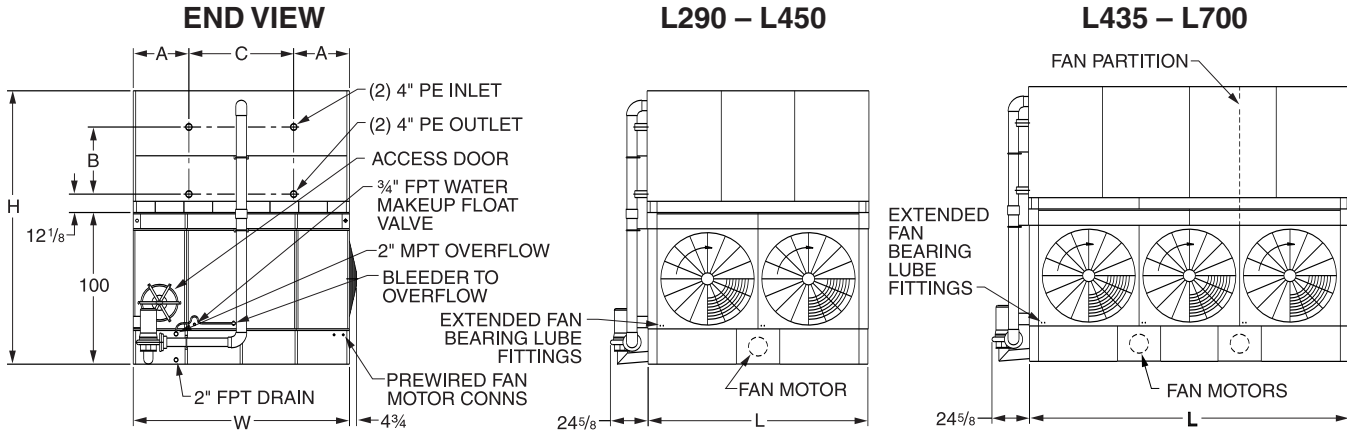
4. Shipping weights include water-circulating pumps.
5. Operating weights include water-circulating pump, water in the coils, and normal water operating level in the sump.

All data in this catalog is subject to change without notice. The standard right hand arrangement as shown has air inlet side on the right when facing coil connection end. Left hand arrangement can be furnished upon request.

Do not use for construction—product drawings available on request.

* Dual-cell units are not shown in cut sheet drawings above. Single-cell base model numbers are one half of the dual-cell model number.

EFC-P



EFC-P Model	Fan Motor CFM	Fan Motor HP ⁽¹⁾	Spray Water GPM ⁽²⁾	Pump Motor HP ⁽²⁾	Remote Sump			Dimensions (Inches)				Tube Coil Weights			HTR kW
					Water In	Sump Drain	Gal. ⁽³⁾ Req'd	Height H	Length L	Width W	Ctrs B	Unit ⁽⁴⁾ Shipp	Unit ⁽⁵⁾ Oprtng	Hvst Sect.	
L290	52,200	7.5	400	3	4-MPT	8-PE	325	166.25	145	116.25	30.25	12,715	20,842	8,840	12.0
L300	57,500	10	400	3	4-MPT	8-PE	325	166.25	145	116.25	30.25	12,740	20,867	8,840	12.0
L315	50,600	7.5	400	3	4-MPT	8-PE	325	173.50	145	116.25	37.50	14,655	23,313	10,780	12.0
L330	49,000	7.5	400	3	4-MPT	8-PE	325	180.25	145	116.25	44.25	16,475	25,664	12,600	12.0
L335	65,800	15	400	3	4-MPT	8-PE	325	166.25	145	116.25	30.25	12,790	20,917	8,840	12.0
L345	55,700	10	400	3	4-MPT	8-PE	325	173.50	145	116.25	37.50	14,680	23,338	10,780	12.0
L350	70,000	20	400	3	4-MPT	8-PE	325	166.25	145	116.25	30.25	12,840	20,967	8,840	12.0
L355	54,000	10	400	3	4-MPT	8-PE	325	180.25	145	116.25	44.25	16,500	25,689	12,600	12.0
L375	63,700	15	400	3	4-MPT	8-PE	325	173.50	145	116.25	37.50	14,730	23,388	10,780	12.0
L390	69,000	20	400	3	4-MPT	8-PE	325	173.50	145	116.25	37.50	14,780	23,438	10,780	12.0
L405	61,500	15	400	3	4-MPT	8-PE	325	180.25	145	116.25	44.25	16,550	25,739	12,600	12.0
L415	68,000	20	400	3	4-MPT	8-PE	325	180.25	145	116.25	44.25	16,600	25,789	12,600	12.0
L435	78,300	7.5 & 5	600	5	4-MPT	8-PE	500	166.25	211	116.25	30.25	18,440	30,445	12,790	18.0
L450	74,800	30	600	5	4-MPT	8-PE	500	180.25	145	116.25	42.00	16,700	23,077	12,600	12.0
L460	86,200	10 & 5	600	5	4-MPT	8-PE	500	166.25	211	116.25	30.25	18,490	30,495	12,790	18.0
L475	75,800	7.5 & 5	600	5	4-MPT	8-PE	500	173.50	211	116.25	37.50	21,280	34,059	15,630	18.0
L505	98,700	15 & 7.5	600	5	4-MPT	8-PE	500	166.25	211	116.25	30.25	18,540	30,545	12,790	18.0
L510	83,400	10 & 5	600	5	4-MPT	8-PE	500	173.50	211	116.25	37.50	21,330	34,109	15,630	18.0
L520	101,800	20 & 10	600	5	4-MPT	8-PE	500	166.25	211	116.25	30.25	18,590	30,595	12,790	18.0
L565	95,400	15 & 7.5	600	5	4-MPT	8-PE	500	173.50	211	116.25	37.50	21,380	34,159	15,630	18.0
L575	101,100	20 & 10	600	5	4-MPT	8-PE	500	173.50	211	116.25	37.50	21,430	34,209	15,630	18.0
L590	92,160	15 & 7.5	600	5	4-MPT	8-PE	500	180.25	211	116.25	44.25	24,000	37,552	18,300	18.0
L635	101,950	20 & 10	600	5	4-MPT	8-PE	500	180.25	211	116.25	44.25	24,100	37,652	18,300	18.0
L700	112,500	30 & 15	850	7.5	4-MPT	8-PE	500	180.25	211	116.25	42.00	24,200	33,697	18,300	18.0
L810-2*	123,000	(2)15	800	(2)3	(2)4-MPT	(2)8-PE	650	180.25	314	116.25	44.25	33,090	51,468	(2)12,595	(2)12.0
L830-2*	136,000	(2)20	800	(2)3	(2)4-MPT	(2)8-PE	650	180.25	314	116.25	44.25	33,190	51,568	(2)12,595	(2)12.0
L870-2*	156,600	(2)7.5&(2)5	1200	(2)5	(2)4-MPT	(2)8-PE	1000	166.25	446	116.25	30.25	36,880	60,891	(2)12,790	(2)18.0
L900-2*	149,600	(2)30	1,200	(2)5	(2)4-MPT	(2)8-PE	650	180.25	314	116.25	42.00	33,400	46,154	(2)12,600	(2)12.0
L920-2*	172,400	(2)10&(2)5	1200	(2)5	(2)4-MPT	(2)8-PE	1000	166.25	446	116.25	30.25	36,980	60,991	(2)12,790	(2)18.0
L950-2*	151,600	(2)7.5&(2)5	1200	(2)5	(2)4-MPT	(2)8-PE	1000	173.50	446	116.25	37.50	42,570	68,128	(2)15,635	(2)18.0
L1010-2*	197,400	(2)15&(2)7.5	1200	(2)5	(2)4-MPT	(2)8-PE	1000	166.25	446	116.25	30.25	37,080	61,091	(2)12,790	(2)18.0
L1020-2*	166,800	(2)10&(2)5	1200	(2)5	(2)4-MPT	(2)8-PE	1000	173.50	446	116.25	37.50	42,670	68,228	(2)15,635	(2)18.0
L1040-2*	203,600	(2)20&(2)10	1200	(2)5	(2)4-MPT	(2)8-PE	1000	166.25	446	116.25	30.25	37,180	61,191	(2)12,790	(2)18.0
L1130-2*	190,800	(2)15&(2)7.5	1200	(2)5	(2)4-MPT	(2)8-PE	1000	173.50	446	116.25	37.50	42,770	68,328	(2)15,635	(2)18.0
L1150-2*	202,200	(2)20&(2)10	1200	(2)5	(2)4-MPT	(2)8-PE	1000	173.50	446	116.25	37.50	42,870	68,428	(2)15,635	(2)18.0
L1180-2*	184,320	(2)15&(2)7.5	1200	(2)5	(2)4-MPT	(2)8-PE	1000	180.25	446	116.25	44.25	47,990	75,095	(2)18,295	(2)18.0
L1270-2*	203,900	(2)20&(2)10	1200	(2)5	(2)4-MPT	(2)8-PE	1000	180.25	446	116.25	44.25	48,190	75,295	(2)18,295	(2)18.0
L1400-2*	225,000	(2)30&(2)15	1,900	(2)7.5	(2)4-MPT	(2)8-PE	1000	180.25	446	116.25	42.00	48,400	67,394	(2)18,300	(2)18.0

1. Fan motor HP is for free air delivery with 0" external static pressure.
2. Remote units are supplied less water-circulating pump(s), float valve(s), and related piping.
3. Values are amount for water in unit and piping—remote sump must also be sized for volume in field-erected spray distribution supply and drain pipes.
4. Shipping weights include water-circulating pumps.

5. Operating weights include water-circulating pump, water in the coils, and normal water operating level in the sump.

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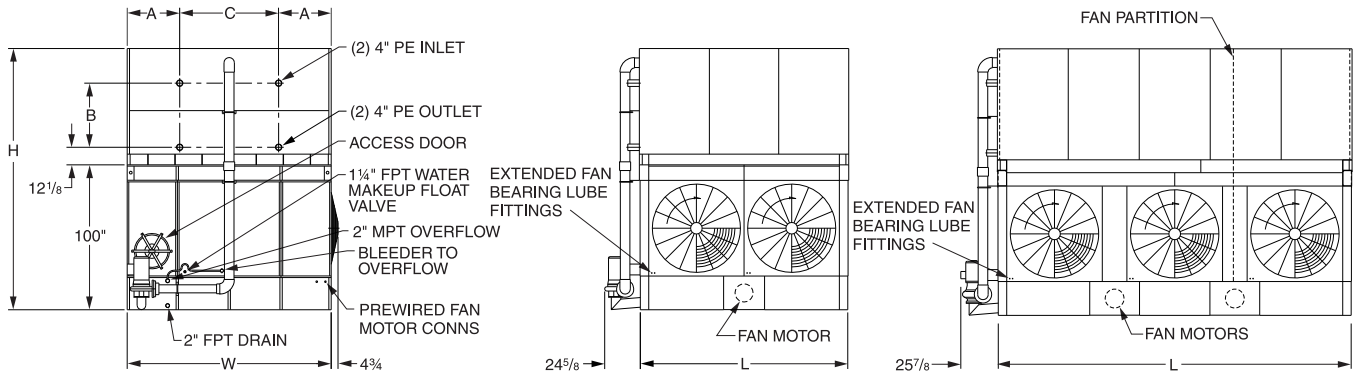
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END VIEW

XL355 – XL530

XL535 – XL970



EFC-P

EFC-P Model	CFM	Fan Motor HP ⁽¹⁾	Spray Water GPM ⁽²⁾	Pump Motor HP ⁽²⁾	Remote Sump			Dimensions (Inches)				Tube Coil Weights			HTR kW
					Water In	Sump Drain	Gal. ⁽³⁾ Req'd	Height H	Length L	Width W	Ctrs B	Unit ⁽⁴⁾ Shipp	Unit ⁽⁵⁾ Oprtng	Hvst Sect.	
XL355	63,600	10	600	5	6-FLG	10-PE	350	166.25	145	141.25	30.25	15,300	25,524	10,500	(2)7.5
XL390	73,100	15	600	5	6-FLG	10-PE	350	166.25	145	141.25	30.25	15,350	25,574	10,500	(2)7.5
XL395	63,100	10	600	5	6-FLG	10-PE	350	173.50	145	141.25	37.50	17,670	28,549	12,870	(2)7.5
XL415	79,700	20	600	5	6-FLG	10-PE	350	166.25	145	141.25	30.25	15,400	25,624	10,500	(2)7.5
XL425	62,500	10	600	5	6-FLG	10-PE	350	180.25	145	141.25	44.25	19,890	31,423	15,090	(2)7.5
XL435	72,200	15	600	5	6-FLG	10-PE	350	173.50	145	141.25	37.50	17,720	28,599	12,870	(2)7.5
XL440	86,300	25	600	5	6-FLG	10-PE	350	166.25	145	141.25	30.25	15,500	25,724	10,500	(2)7.5
XL470	78,900	20	600	5	6-FLG	10-PE	350	173.50	145	141.25	37.50	17,770	28,649	12,870	(2)7.5
XL475	71,300	15	600	5	6-FLG	10-PE	350	180.25	145	141.25	44.25	19,940	31,473	15,090	(2)7.5
XL495	85,500	25	600	5	6-FLG	10-PE	350	173.50	145	141.25	37.50	17,870	28,749	12,870	(2)7.5
XL505	78,200	20	600	5	6-FLG	10-PE	350	180.25	145	141.25	44.25	19,990	31,523	15,090	(2)7.5
XL530	84,700	25	600	5	6-FLG	10-PE	350	180.25	145	141.25	44.25	20,090	31,623	15,090	(2)7.5
XL535	96,200	10 & 5	900	7.5	6-FLG	10-PE	520	166.25	211	141.25	30.25	21,390	36,456	14,740	(2)12.0
XL590	111,000	15 & 7.5	900	7.5	6-FLG	10-PE	520	166.25	211	141.25	30.25	21,490	36,556	14,740	(2)12.0
XL600	95,850	10 & 5	900	7.5	6-FLG	10-PE	520	173.50	211	141.25	37.50	24,930	40,948	18,280	(2)12.0
XL630	123,000	20 & 10	900	7.5	6-FLG	10-PE	520	166.25	211	141.25	30.25	21,540	36,606	14,740	(2)12.0
XL640	95,800	10 & 5	900	7.5	6-FLG	10-PE	520	180.25	211	141.25	44.25	27,940	44,911	21,590	(2)12.0
XL660	132,000	25 & 15	900	7.5	6-FLG	10-PE	520	166.25	211	141.25	30.25	21,690	36,756	14,740	(2)12.0
XL665	110,600	15 & 7.5	900	7.5	6-FLG	10-PE	520	173.50	211	141.25	37.50	25,030	41,048	18,280	(2)12.0
XL710	121,450	20 & 10	900	7.5	6-FLG	10-PE	520	173.50	211	141.25	37.50	25,080	41,098	18,280	(2)12.0
XL715	110,500	15 & 7.5	900	7.5	6-FLG	10-PE	520	180.25	211	141.25	44.25	28,340	45,311	21,590	(2)12.0
XL745	130,400	25 & 15	900	7.5	6-FLG	10-PE	520	173.50	211	141.25	37.50	25,230	41,248	18,280	(2)12.0
XL765	121,100	20 & 10	900	7.5	6-FLG	10-PE	520	180.25	211	141.25	44.25	28,390	45,361	21,590	(2)12.0
XL785	132,100	20 & 10	1050	7.5	6-FLG	12-PE	680	184.00	245	141.25	48.25	29,260	47,789	21,360	(2)15.0
XL805	130,000	25 & 15	900	7.5	6-FLG	10-PE	520	180.25	211	141.25	44.25	28,540	45,511	21,590	(2)12.0
XL830	131,850	25 & 15	1050	7.5	6-FLG	12-PE	680	184.00	245	141.25	48.25	29,430	47,959	21,360	(2)15.0
XL845	142,400	20 & 10	1050	7.5	6-FLG	12-PE	680	191.75	245	141.25	56.00	32,910	52,533	25,010	(2)15.0
XL870	152,000	30 & 15	1050	7.5	6-FLG	12-PE	680	184.00	245	141.25	48.25	30,390	48,926	21,360	(2)15.0
XL895	142,200	25 & 15	1050	7.5	6-FLG	12-PE	680	191.75	245	141.25	56.00	33,080	52,703	25,010	(2)15.0
XL940	151,800	30 & 15	1050	7.5	6-FLG	12-PE	680	191.75	245	141.25	56.00	33,140	52,756	25,010	(2)15.0
XL970	159,390	30 & 15	2400	10	6-FLG	12-PE	683	191.75	245	141.25	56.00	33,340	47,218	25,010	(2)15.0

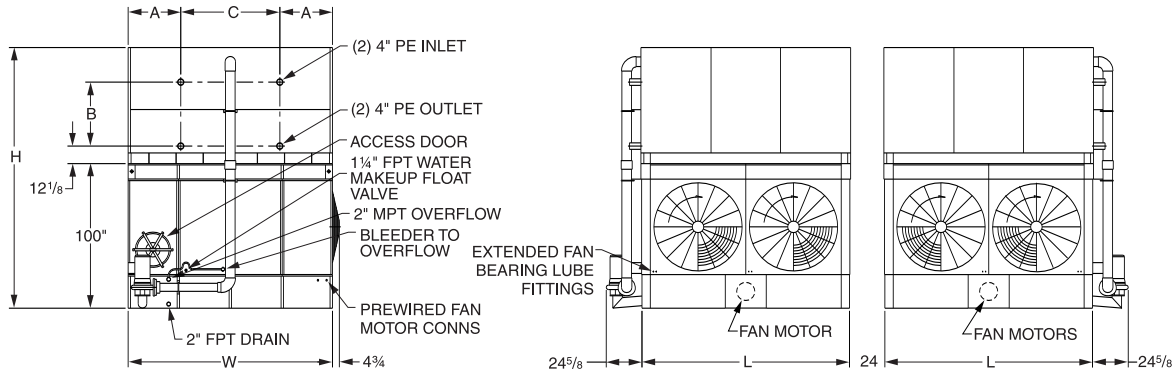
1. Fan motor HP is for free air delivery with 0" external static pressure.
2. Remote units are supplied less water-circulating pump(s), float valve(s), and related piping.
3. Values account for water in unit and piping—remote sump must also be sized for volume in field-erected spray distribution supply and drain pipes.

4. Shipping weights include water-circulating pumps.
5. Operating weights include water-circulating pump, water in the coils, and normal water operating level in the sump.

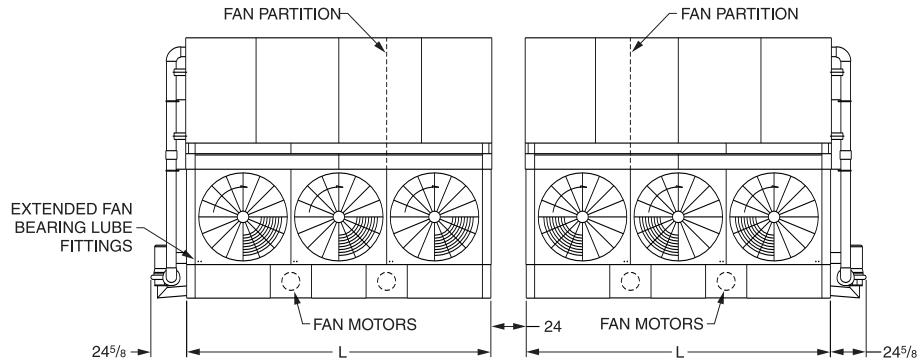
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Do not use for construction—product drawings available on request.

END VIEW



XL1070-2 – XL1940-2



EFC-P Model	Fan Motor CFM	Fan Motor HP ⁽¹⁾	Spray Water GPM ⁽²⁾	Pump Motor HP ⁽²⁾	Remote Sump			Dimensions (Inches)				Tube Coil Weights			HTR kW
					Water In	Sump Drain	Gal. ⁽³⁾ Req'd	Height H	Length L	Width W	Ctrs B	Unit ⁽⁴⁾ Shipg	Unit ⁽⁵⁾ Oprng	Hvst Sect.	
XL830-2	159,400	(2)20	1200	(2)5	(2)6-FLG	(2)10-PE	750	166.25	145	141.25	30.25	30,800	51,248	(2)10,500	(4)7.5
XL850-2	125,000	(2)10	1200	(2)5	(2)6-FLG	(2)10-PE	750	180.25	145	141.25	44.25	39,770	62,837	(2)15,085	(4)7.5
XL870-2	144,400	(2)15	1200	(2)5	(2)6-FLG	(2)10-PE	750	173.50	145	141.25	37.50	35,440	57,197	(2)12,870	(4)7.5
XL880-2	172,600	(2)25	1200	(2)5	(2)6-FLG	(2)10-PE	750	166.25	145	141.25	30.25	31,000	51,448	(2)10,500	(4)7.5
XL940-2	157,800	(2)20	1200	(2)5	(2)6-FLG	(2)10-PE	750	173.50	145	141.25	37.50	35,540	57,297	(2)12,870	(4)7.5
XL950-2	142,600	(2)15	1200	(2)5	(2)6-FLG	(2)10-PE	750	180.25	145	141.25	44.25	39,870	62,937	(2)15,085	(4)7.5
XL990-2	171,000	(2)25	1200	(2)5	(2)6-FLG	(2)10-PE	750	173.50	145	141.25	37.50	35,740	57,497	(2)12,870	(4)7.5
XL1010-2	156,400	(2)20	1200	(2)5	(2)6-FLG	(2)10-PE	750	180.25	145	141.25	44.25	39,970	63,037	(2)15,085	(4)7.5
XL1060-2	169,400	(2)25	1200	(2)5	(2)6-FLG	(2)10-PE	750	180.25	145	141.25	44.25	40,170	63,237	(2)15,085	(4)7.5
XL1070-2	192,400	(2)10&(2)5	1800	(2)7.5	(2)6-FLG	(2)10-PE	1040	166.25	211	141.25	30.25	42,780	72,911	(2)14,740	(4)12.0
XL1180-2	222,000	(2)15&(2)7.5	1800	(2)7.5	(2)6-FLG	(2)10-PE	1040	166.25	211	141.25	30.25	42,980	73,111	(2)14,740	(4)12.0
XL1200-2	191,700	(2)10&(2)5	1800	(2)7.5	(2)6-FLG	(2)10-PE	1040	173.50	211	141.25	37.50	49,860	81,896	(2)18,280	(4)12.0
XL1260-2	246,000	(2)20&(2)10	1800	(2)7.5	(2)6-FLG	(2)10-PE	1040	166.25	211	141.25	30.25	43,080	73,211	(2)14,740	(4)12.0
XL1280-2	191,600	(2)10&(2)5	1800	(2)7.5	(2)6-FLG	(2)10-PE	1040	180.25	211	141.25	44.25	55,900	89,841	(2)21,600	(4)12.0
XL1320-2	264,000	(2)25&(2)15	1800	(2)7.5	(2)6-FLG	(2)10-PE	1040	166.25	211	141.25	30.25	43,380	73,511	(2)14,740	(4)12.0
XL1330-2	221,200	(2)15&(2)7.5	1800	(2)7.5	(2)6-FLG	(2)10-PE	1040	173.50	211	141.25	37.50	50,060	82,096	(2)18,280	(4)12.0
XL1420-2	242,900	(2)20&(2)10	1800	(2)7.5	(2)6-FLG	(2)10-PE	1040	173.50	211	141.25	37.50	50,160	82,196	(2)18,280	(4)12.0
XL1430-2	221,000	(2)15&(2)7.5	1800	(2)7.5	(2)6-FLG	(2)10-PE	1040	180.25	211	141.25	44.25	56,700	90,641	(2)21,600	(4)12.0
XL1490-2	260,800	(2)25&(2)15	1800	(2)7.5	(2)6-FLG	(2)10-PE	1040	173.50	211	141.25	37.50	50,460	82,496	(2)18,280	(4)12.0
XL1530-2	242,200	(2)20&(2)10	1800	(2)7.5	(2)6-FLG	(2)10-PE	1040	180.25	211	141.25	44.25	56,800	90,741	(2)21,600	(4)12.0
XL1570-2	264,200	(2)20&(2)10	2100	(2)7.5	(2)6-FLG	(2)12-PE	1360	184.00	245	141.25	48.25	58,530	95,402	(2)21,365	(4)15.0
XL1610-2	260,000	(2)25&(2)15	1800	(2)7.5	(2)6-FLG	(2)10-PE	1040	180.25	211	141.25	44.25	57,100	91,041	(2)21,600	(4)12.0
XL1660-2	263,700	(2)25&(2)15	2100	(2)7.5	(2)6-FLG	(2)12-PE	1360	184.00	245	141.25	48.25	58,870	95,929	(2)21,365	(4)15.0
XL1690-2	284,800	(2)20&(2)10	2100	(2)7.5	(2)6-FLG	(2)12-PE	1360	191.75	245	141.25	56.00	65,820	105,081	(2)25,010	(4)15.0
XL1740-2	304,000	(2)30&(2)15	2100	(2)7.5	(2)6-FLG	(2)12-PE	1360	184.00	245	141.25	48.25	60,790	97,849	(2)21,365	(4)15.0
XL1790-2	284,400	(2)25&(2)15	2100	(2)7.5	(2)6-FLG	(2)12-PE	1360	191.75	245	141.25	56.00	66,160	105,421	(2)25,010	(4)15.0
XL1880-2	303,600	(2)30&(2)15	2100	(2)7.5	(2)6-FLG	(2)12-PE	1360	191.75	245	141.25	56.00	66,280	105,541	(2)25,010	(4)15.0
XL 1940-2	318,780	(2)30&(2)15	2400	(2)10	(2)6-FLG	(2)12-PE	1366	191.75	245	141.25	56.00	66,680	94,466	(2)25,010	(4)15.0

Do not use for construction—product drawings available on request. NOTE: See footnotes on page 15.

EFC-P OPTIONAL EQUIPMENT

DISCHARGE HOOD WITH POSITIVE CLOSURE DAMPERS

To reduce chimney effect heat losses from the cooler when idle, a discharge hood with positive closure dampers can be furnished. For installations where low cooler height is required, a low silhouette discharge hood with positive closure dampers is available. The low-silhouette damper assembly is designed for low air pressure drop and does not require an oversized fan motor.

A tapered discharge hood, with positive-closure dampers, can also be furnished for installations where the height and velocity of the fluid cooler air discharge must be increased.

The dampers are operated by a two-position actuator and linkage. Actuator and linkage are factory installed. All wiring and actuator controls must be furnished by others. A 120 volt power supply is required. Damper actuator should be interlocked with the temperature control system so the dampers are open when the fans are running and closed when the fans are off.

Tapered discharge hood with dampers increases the static pressure on the fan and require the fan motor to be increased to the next larger size. **NOTE: Option adds 4 - 6 ft to unit height.**

ELECTRIC PAN WATER LEVEL CONTROL

For installations where very close control of the pan water is required, an electric water level system can be provided that consists of a weather-protected electric float switch mounted on the pan section and weather-protected solenoid valve mounted on the water makeup connection. The float switch and solenoid valve are factory wired to a NEMA 4 junction box.

PAN HEATER(S)

To prevent freeze-up of water in the pan when the unit is idle, an electric immersion heater(s) can be furnished and installed in the pan.

The electric immersion heater is a stainless steel sheath type that is controlled by a thermostat that senses the pan water temperature and a low water cutout switch that prevents operation of the heater if the water level in the pan is insufficient. The heater will maintain the pan water at 40°F when the ambient is -10°F with a 45 mph wind, and the unit is not operating.

COIL-CASING INSULATION

To reduce heat loss from the cooler, insulation can be furnished and installed on the casing of the cooler.

The insulation consists of a one inch layer of Armaflex that is glued to the casing and is covered by a protective paint coating. For maximum reduction of heat loss from the idle cooler, the insulation should be used in conjunction with positive-closure discharge dampers. All Factory discharge hoods may be furnished with insulation to minimize losses.

VIBRATION ISOLATORS

Where building codes require vibration isolation, spring-type vibration isolators can be furnished to properly isolate the equipment from the mounting structure.

HOT DIP GALVANIZED AFTER FABRICATION

For the most effective method of corrosion protection, all casing material for the pan section, fan section, and coil section can be provided using *Hot Dip Galvanized After Fabrication* components.

CAPACITY CONTROL

To maintain system leaving water temperatures during low ambient temperatures or in systems with widely fluctuating loads, several types of capacity control systems are offered:

TWO-SPEED FAN MOTORS

On all EFC fluid coolers, two-speed fan motors are available and one step of capacity reduction by reducing the fan speed. These motors are available with either single or dual windings.

FAN PARTITIONS

On EFC-P vane axial fan fluid coolers with two or more fan motors, partitions can be installed between fans to allow cycling some motor/fan combinations, allowing sequential staging of the fans. These partitions prevent idle fans from turning backwards and water from being blown out the idle fans.

COIL CONNECTIONS

Our evaporative fluid coolers can be supplied with MPT, Victaulic groove, flanged, or copper sweat coil connections when required. Contact your local Johnson Controls sales representative or the Factory for complete details.

MULTICIRCUITED COIL

Cooling coils can be divided into multiple circuits to satisfy most cooling system requirements. This arrangement might be considered for a split heat pump system requiring a common fluid cooler.

LOW-NOISE FANS

In a noise sensitive area, low-noise-level fans can be provided on the EFC-P vane axial units.

CATWALKS AND HANDRAILS

Optionally available catwalks and handrails offer convenient access to water eliminators and spray trees.

As configured at the Factory and provided for field assembly, these items are ruggedly designed with OSHA requirements in mind. They mount to the fluid cooler structure without requiring any casing penetrations.

CONTROL PANEL

To minimize design engineering and field wiring, we offer single-point electrical connections with all the necessary components in a control panel. Panels include: main disconnect(s), individual fusing of all major components, motor starters with 3-phase overload protection, 120 volt single-phase control voltage transformer, Hand-Off-Auto switch for both manual and automatic startups, terminal strip with custom wiring for stage controllers, and a NEMA-4 enclosure. Contact your local Johnson Controls representative or the Factory for your specific design applications.

EFC-P SERIES RIGGING AND FOUNDATION LAYOUT

ASSEMBLY INSTRUCTIONS:

Step 1

Take mastic from parts box and place mastic on fan/pan section as shown. Remove paper strip before lowering coil section.

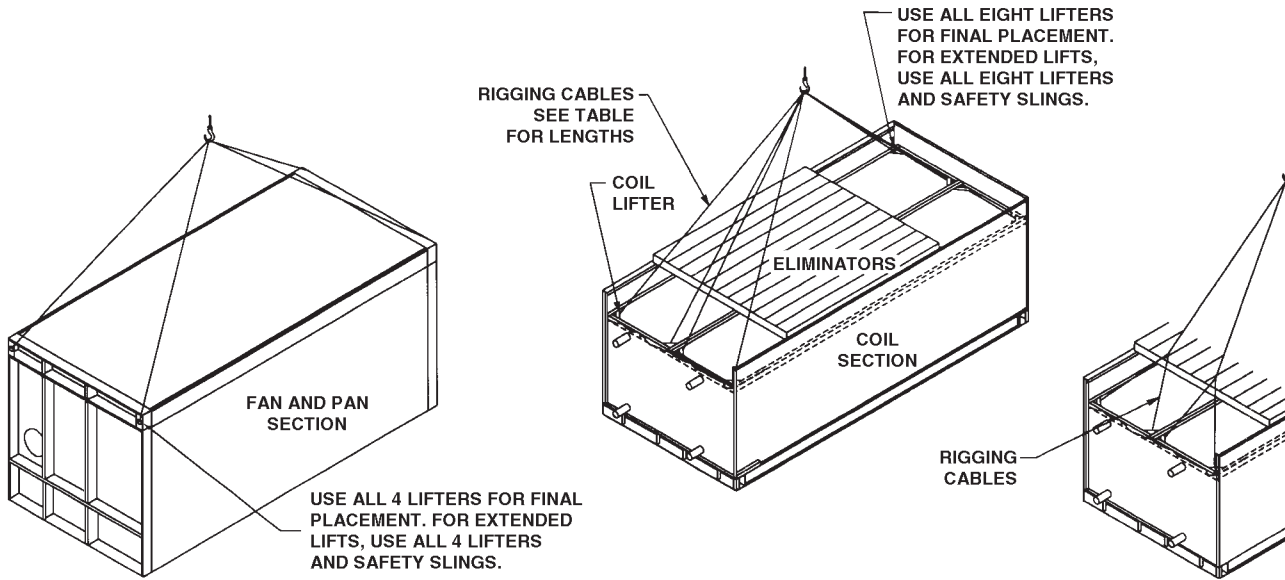
Step 2

Lower coil section to pan/fan section. Use drift pins in four alignment holes to guide coil section in final placement.

Step 3

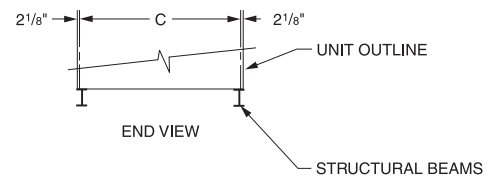
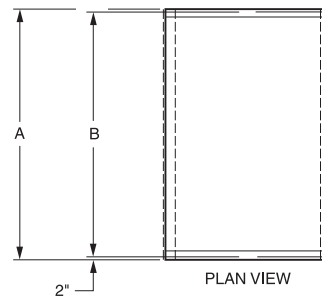
On all four sides, install fasteners in holes provided.

EFC-P



EFC-P - VANE AXIAL PLATFORM LAYOUT

Model #s	A	B	C
S 90 through S 175 S 185, S 190, S 200, S 205	145	141	61.75
S 180, S 195, and S 210 through S 270	145	141	68.5
M 155 through M 280	121.87	117.87	92
M 285 through M 430	177	173	92
ML 235 through ML 345	145	141	92
ML 350 through ML 520	211	207	92
L 290 through L 450	145	141	112
L 435 through L 700	211	207	112
XL 355 through XL 530	145	141	137
XL 535 through XL 805	211	207	137
XL 830 through XL 970	245	241	137



NOTE: Beams and/or piers should be sized in accordance with standard engineering practices. Beam deflection should not exceed 1/360 of span, not to exceed 1/2 inch.

IDFC SERIES INDUCED DRAFT FLUID COOLER

Johnson Controls continues to set the standard for evaporative fluid cooler quality with the most rugged, most reliable induced draft fluid coolers available, our IDFC fluid coolers.

Differentiating the Imeco IDFC series from lesser induced fluid coolers are the following important standard design features:

- Every IDFC fluid cooler coil assembly is **pressure tested** under water before and after galvanizing at **450 psig**, a 28% higher test level than competitive fluid coolers. This yields a **design operating pressure of 300 psig**.
- Every IDFC induced draft evaporative fluid cooler comes with an unparalleled **five year motor and drive warranty**.
- Industrially designed, flange-mounted, fan shaft roller bearings have a **minimum L10 bearing life of 133,500 hours**, 78% greater than the competition's.

If the concept of an induced draft fluid cooler appeals to you, don't settle for a lesser quality offering.

Choose the fluid cooler with the best corrosion protection, the most vigorous safety testing, the highest pressure rating, the best and longest warranty, and the fluid cooler with the components designed for longest, most problem free life. The choice is Imeco IDFC series, induced draft, evaporative fluid cooler.

IDFC SERIES STANDARD FEATURES

FLUID COOLER COIL

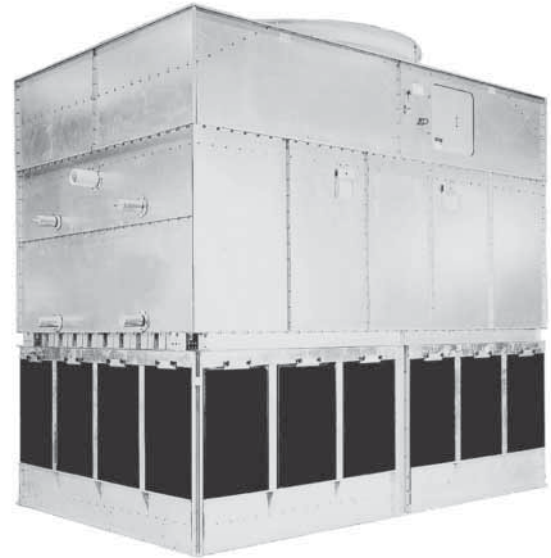
The IDFC series fluid cooler utilizes heavy-wall coils with eddy-current-tested steel tubing to ensure long life. Coil circuits are staggered in the direction of airflow to ensure maximum air turbulence and water coverage across the coil for optimum heat transfer performance.

All IDFC series fluid cooler **coils are submersion tested with 450 psi air pressure**. This results in a **design working pressure of 300 psi**. This unparalleled pressure testing and correspondingly high pressure rating provides additional protection for the problem-free operation of your evaporative fluid cooler.

IDFC series fluid cooler coils are hot dip galvanized after fabrication.

PUMP AND SPRAY PIPING

The spray water circulating pump is a close-coupled centrifugal unit with a ductile iron housing, closed impeller, mechanical seal, and is driven by a TEFC motor with a 1.15 service factor. The pump is mounted vertically under an all-weather hood to permit self draining and is completely piped, using schedule 40 PVC pipe, to the spray system inlet connection. The piping includes a bleed line with adjustable valve located between the pump discharge and overflow connection to meter the necessary water bleed-off.



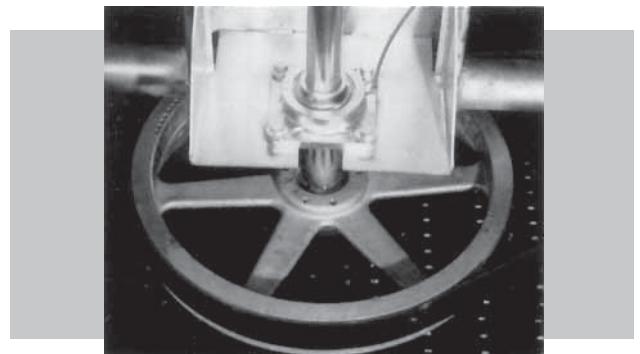
IDFC

FANS, GUARDS, BEARINGS, MOTORS, AND DRIVES
IDFC series fluid coolers feature 96" or 120" diameter axial fans with close-fitting cowls and venturi inlets. Fan design has been optimized to provide performance that is most efficiently matched to the fluid cooler airflow requirements.

The fan shaft bearings are double-row, flange-mounted, self-aligning, tapered roller bearings, with lubrication lines extended for ease of service. Its heavy-duty "roller", as opposed to "ball", design features a **minimum L10 life of 133,500 hours, 78% greater than the competition**.

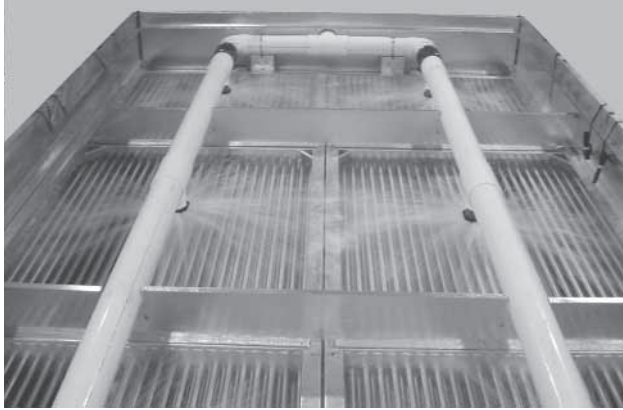
On our IDFC series fluid coolers, we use premium quality, totally enclosed motors designed with a 1.15 service factor. The combination of these motors, our reliable, time tested fan technology, and heavy-duty roller bearing design allows us to offer an **unprecedented five-year warranty on the IDFC series motor and drive (fan, fan shaft, sheaves, and fan shaft bearings)**.

Further, the IDFC fluid cooler heavy-duty fan guard is *Hot Dip Galvanized After Fabrication* for the ultimate in corrosion protection and durability.



SPRAY ASSEMBLY

The IDFC noncorroding PVC spray pipes provide complete and even water coverage from low pressure, large orifice, clog-resistant nozzles. This efficient spray system provides complete and continuous water coverage to maximize life-time fluid cooler capacity, reducing scale formation under all operating conditions.



MOISTURE ELIMINATORS

The IDFC multiple break design eliminator provides very efficient removal of water droplets and mist from the air stream. These small, highly efficient eliminators can easily be removed for coil and spray assembly inspection.

The eliminators are constructed of noncorroding PVC for maximum protection against even the most corrosive atmospheres.

Optional, heavier duty moisture eliminators are available to increase eliminator life and withstand frequent handling without damage. Heavy-duty, bolted, PVC eliminators provide a lightweight, but durable alternative. The eliminator blade thickness is increased by a factor of 40. Eliminators are also available in steel, mounted in a heavy-gauge steel framework, *Hot Dip Galvanized After Fabrication*.

COIL CASING

IDFC coil casings are constructed of heavy-gauge galvanized steel. All casing panels are flanged and positively closed with nut and bolt hardware. Internal structural members provide added integrity. A large, inward-opening, access door provides serviceability to fan drive equipment, moisture eliminators, and spray tree assembly. As an option, the entire casing is available *Hot Dip Galvanized After Fabrication* to provide the highest level of corrosion protection.

FACTORY TESTING

All IDFC units are fabricated, assembled, and tested at the factory to ensure consistent high quality construction and performance before shipment. This ensures trouble-free installation and lasting service.

HIGH QUALITY FLUID COOLER COMPONENTS

- HEAVY-WALL STEEL COILS ARE *Hot Dip Galvanized After Fabrication*
- PITCHED COIL FOR COMPLETE DRAINAGE
- STAGGERED TUBE COIL FOR MAXIMUM HEAT TRANSFER
- LARGE, SLOW SPEED FAN
- EASY BELT ADJUSTMENT
- SOLID BRASS FLOAT VALVE WITH PLASTIC FLOAT
- OVERSIZED STRAINER
- FULL COVERAGE, LARGE ORIFICE, CLOG-REDUCING NOZZLE FOR CONTINUOUS SPRAY COVERAGE
- CONVENIENT EXTENDED LUBRICATION POINTS FOR SIMPLIFIED SERVICE

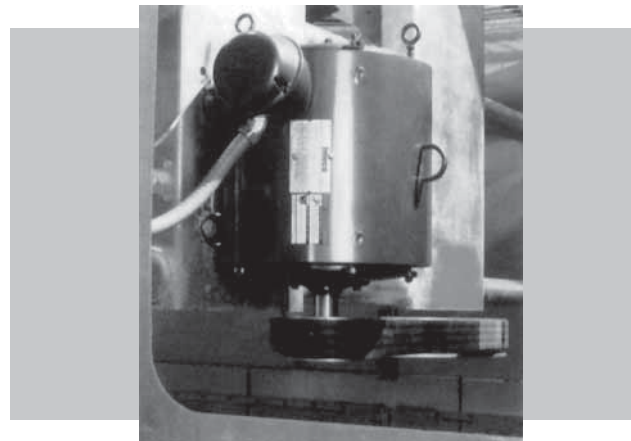
OTHER COMPONENTS, OUR DETAILED COMMITMENT TO QUALITY

From our stainless steel sump suction strainers to our rigid, corrosion-free PVC air inlet louvers and eliminators, to our industry best, clog-reducing nozzles, Imeco's commitment to quality is evident in every component we use.

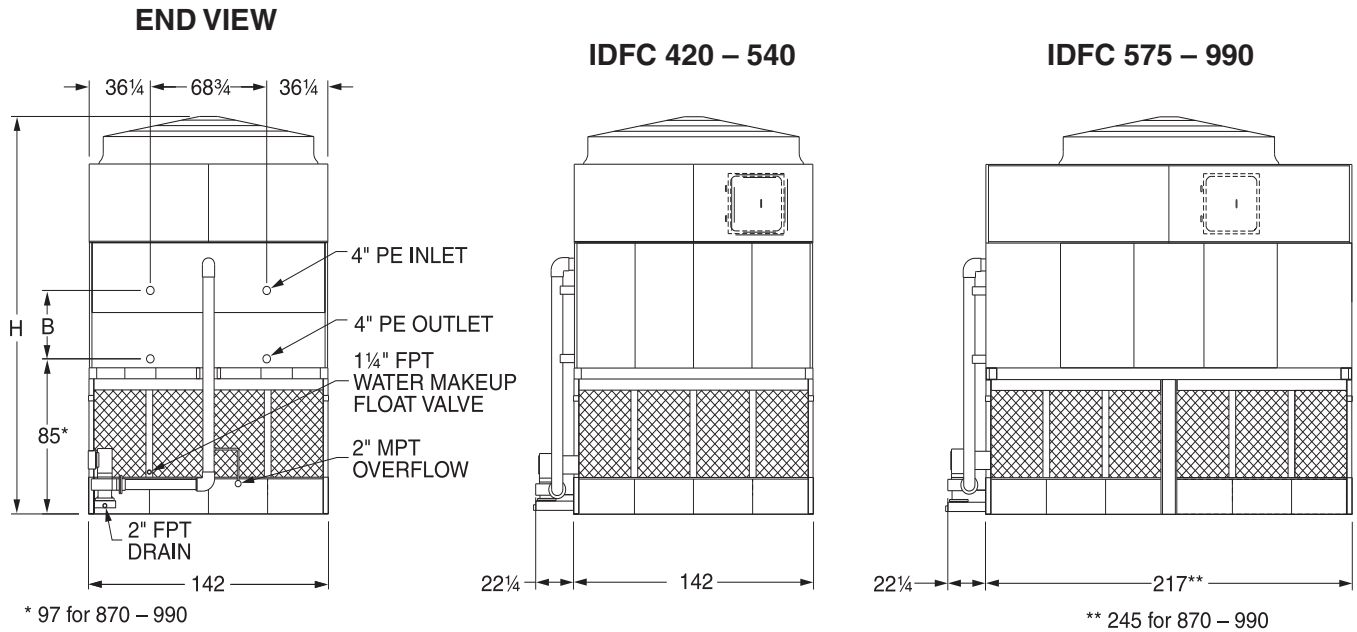
Further, we measure and test the quality and performance of your completely assembled evaporative fluid cooler in our factory. Unlike other manufacturers, we run test the fan, fan drive, and water distribution system of your IDFC series evaporative fluid cooler.

Your evaporative fluid cooler installation is expected to last. The fluid cooler produces a visible reflection on the quality of the installation and the condition of the facility for many years after it is put into operation. With this in mind, we've designed the IDFC series to offer you maximum reliability and durability.

Best built, most rigorously tested, designed to provide long term reliability and value... the Imeco IDFC Series Induced Draft fluid cooler your standard for evaporative fluid cooler quality.



IDFC SERIES ENGINEERING DATA



IDFC

IDFC Model	CFM	Fan Motor HP ⁽¹⁾	Spray Water GPM ⁽²⁾	Pump Motor HP ⁽²⁾	Remote Sump			Dimensions		Tube Coil Weights			HTR kW
					Water In	Sump Drain	Gal. ⁽³⁾ Req'd	Height H	Ctrs B	Unit ⁽⁴⁾ Ship'g	Unit ⁽⁵⁾ Operat'g	Heaviest Section	
420	81,300	15	715	5	6" PE	10" PE	600	212	30.25	16,099	22,511	11,957	(2) 6.0
435	84,900	20	715	5	6" PE	10" PE	600	212	30.25	16,199	22,611	12,057	(2) 6.0
450	88,600	25	715	5	6" PE	10" PE	600	212	30.25	16,299	22,711	12,157	(2) 6.0
490	84,600	20	715	5	6" PE	10" PE	600	219	37.50	18,196	24,829	14,054	(2) 6.0
505	87,300	25	715	5	6" PE	10" PE	600	219	37.50	18,296	24,929	14,154	(2) 6.0
520	82,100	25	715	5	6" PE	10" PE	600	225	44.25	20,262	27,117	16,192	(2) 6.0
540	87,300	30	715	5	6" PE	10" PE	600	225	44.25	20,362	27,217	19,292	(2) 6.0
575	105,300	15	1,050	7.5	6" PE	10" PE	900	212	30.25	24,173	33,800	17,953	(2) 9.0
615	115,800	20	1,050	7.5	6" PE	10" PE	900	212	30.25	24,273	33,900	18,053	(2) 9.0
645	124,800	25	1,050	7.5	6" PE	10" PE	900	212	30.25	24,375	34,000	18,153	(2) 9.0
670	132,600	30	1,050	7.5	6" PE	10" PE	900	212	30.25	24,473	34,100	18,253	(2) 9.0
700	117,000	20	1,050	7.5	6" PE	10" PE	900	219	37.50	27,322	37,281	21,102	(2) 9.0
735	125,800	25	1,050	7.5	6" PE	10" PE	900	219	37.50	27,422	37,381	21,202	(2) 9.0
765	133,800	30	1,050	7.5	6" PE	10" PE	900	219	37.50	27,522	37,481	21,302	(2) 9.0
800	127,400	30	1,050	7.5	6" PE	10" PE	900	225	44.25	30,423	40,716	24,313	(2) 9.0
835	133,800	40	1,050	7.5	6" PE	10" PE	900	225	44.25	30,523	40,816	24,413	(2) 9.0
870	153,000	40	1,050	7.5	6" PE	10" PE	900	229	48.25	32,222	44,065	24,183	(2) 12.0
895	141,700	30	1,050	7.5	6" PE	10" PE	900	237	56.00	35,123	47,300	27,833	(2) 12.0
940	153,000	40	1,050	7.5	6" PE	10" PE	900	237	56.00	35,243	47,420	27,953	(2) 12.0
955	164,140	50	1,050	7.5	6" PE	10" PE	900	237	56.00	35,343	47,520	28,013	(2) 12.0
990	164,140	50	1,100	10	6" PE	10" PE	900	237	56.00	35,343	47,520	28,013	(2) 12.0

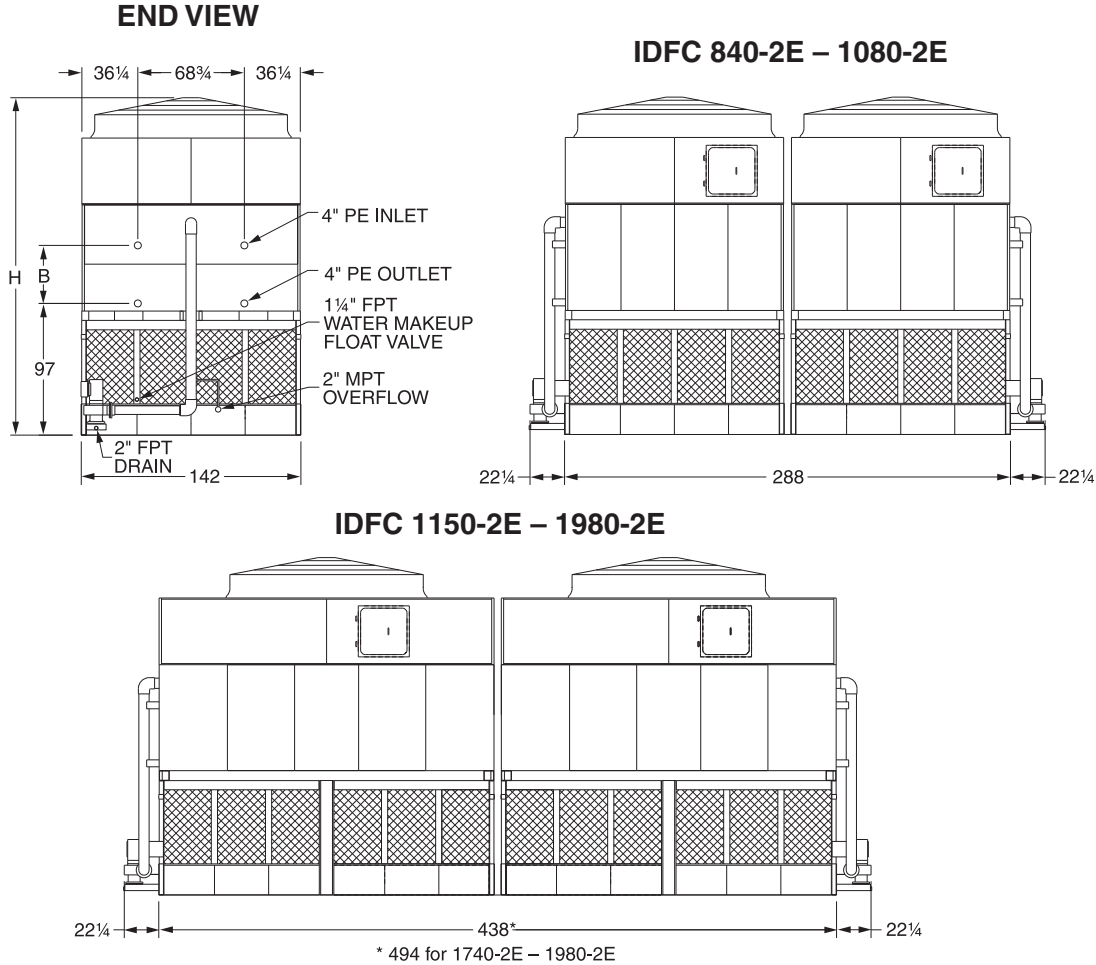
1. Fan motor HP is for free air delivery with 0" external static pressure.
2. Remote units are supplied less water-circulating pump(s), float valve(s), and related piping.
3. Values account for water in unit and piping—remote sump must also be sized for volume in field-erected spray distribution supply and drain pipes.

4. Shipping weights include water-circulating pumps.
5. Operating weights include water-circulating pump, water in the coils, and normal water operating level in the sump.

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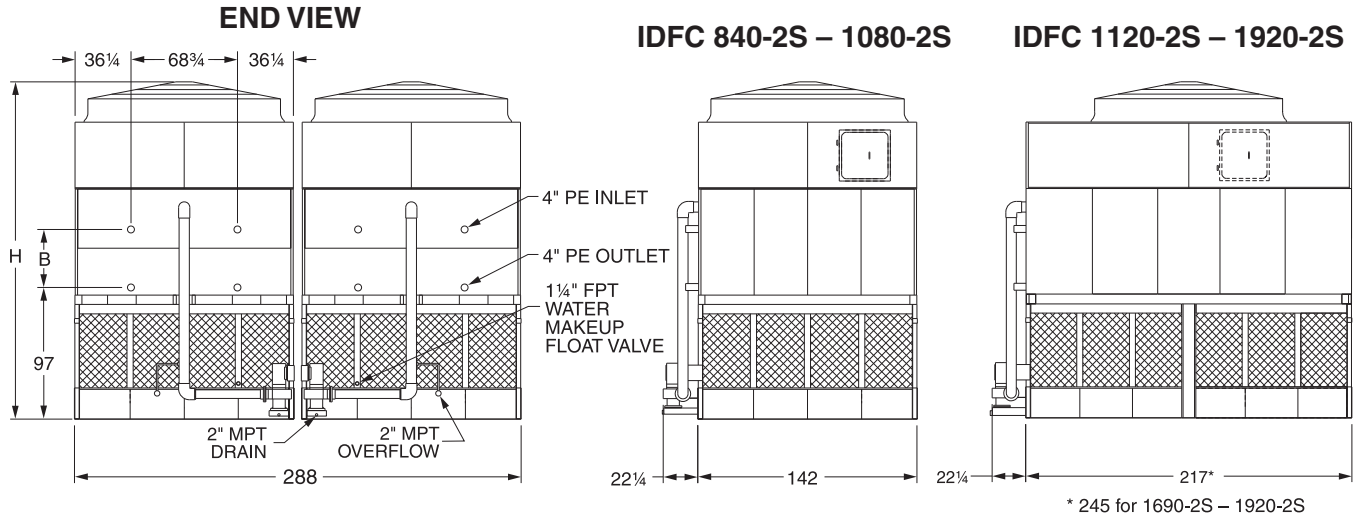
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IDFC



IDFC Model	CFM	Fan Motor HP ⁽¹⁾	Spray Water GPM ⁽²⁾	Pump Motor HP ⁽²⁾	Remote Sump			Dimensions		Tube Coil Weights			HTR kW
					Water In	Sump Drain	Gal. ⁽³⁾ Req'd	Height H	Ctrs B	Unit ⁽⁴⁾ Ship'g	Unit ⁽⁵⁾ Operat'g	Heaviest Section	
840-2E	162,600	(2)15	1,430	(2)5	(2)6" PE	(2)10" PE	1,200	224	30.25	32,198	45,022	(2)11,957	(2) 6.0
870-2E	169,800	(2)20	1,430	(2)5	(2)6" PE	(2)10" PE	1,200	224	30.25	32,398	45,222	(2)12,057	(2) 6.0
900-2E	177,200	(2)25	1,430	(2)5	(2)6" PE	(2)10" PE	1,200	224	30.25	32,598	45,422	(2)12,157	(2) 6.0
980-2E	169,200	(2)20	1,430	(2)5	(2)6" PE	(2)10" PE	1,200	231	37.50	36,392	49,658	(2)14,054	(2) 6.0
1010-2E	174,600	(2)25	1,430	(2)5	(2)6" PE	(2)10" PE	1,200	231	37.50	36,592	49,858	(2)14,154	(2) 6.0
1040-2E	164,200	(2)25	1,430	(2)5	(2)6" PE	(2)10" PE	1,200	237	44.25	40,524	54,234	(2)16,192	(2) 6.0
1080-2E	174,600	(2)30	1,430	(2)5	(2)6" PE	(2)10" PE	1,200	237	44.25	40,724	54,434	(2)19,292	(2) 6.0
1150-2E	210,600	(2)15	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	224	30.25	48,346	67,600	(2)17,953	(2) 9.0
1230-2E	231,600	(2)20	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	224	30.25	48,546	67,800	(2)18,053	(2) 9.0
1290-2E	249,600	(2)25	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	224	30.25	48,750	68,000	(2)18,153	(2) 9.0
1340-2E	265,200	(2)30	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	224	30.25	48,946	68,200	(2)18,253	(2) 9.0
1400-2E	234,000	(2)20	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	231	37.50	54,644	74,562	(2)21,102	(2) 9.0
1470-2E	251,600	(2)25	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	231	37.50	54,844	74,762	(2)21,202	(2) 9.0
1530-2E	267,600	(2)30	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	231	37.50	55,044	74,962	(2)21,302	(2) 9.0
1600-2E	254,800	(2)30	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	237	44.25	60,846	81,432	(2)24,313	(2) 9.0
1670-2E	267,600	(2)40	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	237	44.25	61,046	81,632	(2)24,413	(2) 9.0
1740-2E	306,000	(2)40	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	242	48.25	64,444	88,130	(2)24,183	(2) 12.0
1790-2E	283,400	(2)30	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	249	56.00	70,246	94,600	(2)27,833	(2) 12.0
1880-2E	306,000	(2)40	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	249	56.00	70,486	94,840	(2)27,953	(2) 12.0
1910-2E	328,280	(2)50	2,100	(2)7.5	(2)6" PE	(2)10" P	1,800	249	56.00	70,665	95,019	(2)28,013	(4) 12.0
1980-2E	328,280	(2)50	2,200	(2)10	(2)6" PE	(2)10" P	1,800	249	56.00	70,686	95,040	(2)28,013	(4) 12.0

- Fan motor HP is for free air delivery with 0" external static pressure.
 - Remote units are supplied less water-circulating pump(s), float valve(s), and related piping.
 - Values account for water in unit and piping—remote sump must also be sized for volume in field-erected spray distribution supply and drain pipes.
 - Shipping weights include water-circulating pumps.
 - Operating weights include water-circulating pump, water in the coils, and normal water operating level in the sump.
- All data in this catalog is subject to change without notice.
Do not use for construction—product drawings available on request.*



IDFC

IDFC Model	CFM	Fan Motor HP ⁽¹⁾	Spray Water GPM ⁽²⁾	Pump Motor HP ⁽²⁾	Remote Sump			Dimensions		Tube Coil Weights			HTR kW
					Water In	Sump Drain	Gal. ⁽³⁾ Req'd	Height H	Ctrs B	Unit ⁽⁴⁾ Ship'g	Unit ⁽⁵⁾ Operat'g	Heaviest Section	
840-2S	162,600	(2)15	1,430	(2)5	(2)6" PE	(2)10" PE	1,200	224	30.25	32,198	45,022	(2)11,957	(2) 6.0
870-2S	169,800	(2)20	1,430	(2)5	(2)6" PE	(2)10" PE	1,200	224	30.25	32,398	45,222	(2)12,057	(2) 6.0
900-2S	177,200	(2)25	1,430	(2)5	(2)6" PE	(2)10" PE	1,200	224	30.25	32,598	45,422	(2)12,157	(2) 6.0
980-2S	169,200	(2)20	1,430	(2)5	(2)6" PE	(2)10" PE	1,200	231	37.50	36,392	49,658	(2)14,054	(2) 6.0
1010-2S	174,600	(2)25	1,430	(2)5	(2)6" PE	(2)10" PE	1,200	231	37.50	36,592	49,858	(2)14,154	(2) 6.0
1040-2S	164,200	(2)25	1,430	(2)5	(2)6" PE	(2)10" PE	1,200	237	44.25	40,524	54,234	(2)16,192	(2) 6.0
1080-2S	174,600	(2)30	1,430	(2)5	(2)6" PE	(2)10" PE	1,200	237	44.25	40,724	54,434	(2)19,292	(2) 6.0
1120-2S	200,070	(2)15	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	224	30.25	48,346	67,600	(2)17,953	(2) 9.0
1200-2S	220,020	(2)20	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	224	30.25	48,546	67,800	(2)18,053	(2) 9.0
1260-2S	237,120	(2)25	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	224	30.25	48,750	68,000	(2)18,153	(2) 9.0
1300-2S	251,940	(2)30	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	224	30.25	48,946	68,200	(2)18,253	(2) 9.0
1360-2S	222,300	(2)20	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	231	37.50	54,644	74,562	(2)21,102	(2) 9.0
1430-2S	239,020	(2)25	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	231	37.50	54,844	74,762	(2)21,202	(2) 9.0
1490-2S	254,220	(2)30	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	231	37.50	55,044	74,962	(2)21,302	(2) 9.0
1560-2S	242,060	(2)30	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	237	44.25	60,846	81,432	(2)24,313	(2) 9.0
1620-2S	254,220	(2)40	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	237	44.25	61,046	81,632	(2)24,413	(2) 9.0
1690-2S	281,520	(2)40	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	242	48.25	64,444	88,130	(2)24,183	(2) 12.0
1740-2S	260,730	(2)30	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	249	56.00	70,246	94,600	(2)27,833	(2) 12.0
1810-2S	281,520	(2)40	2,100	(2)7.5	(2)6" PE	(2)10" PE	1,800	249	56.00	70,486	94,840	(2)27,953	(2) 12.0
1840-2S	302,020	(2)50	2,100	(2)7.5	(2)6" PE	(2)10" P	1,800	249	56.00	70,665	95,019	(2)28,013	(4) 12.0
1920-2S	302,020	(2)50	2,200	(2)10	(2)6" PE	(2)10" P	1,800	249	56.00	70,686	95,040	(2)28,013	(4) 12.0

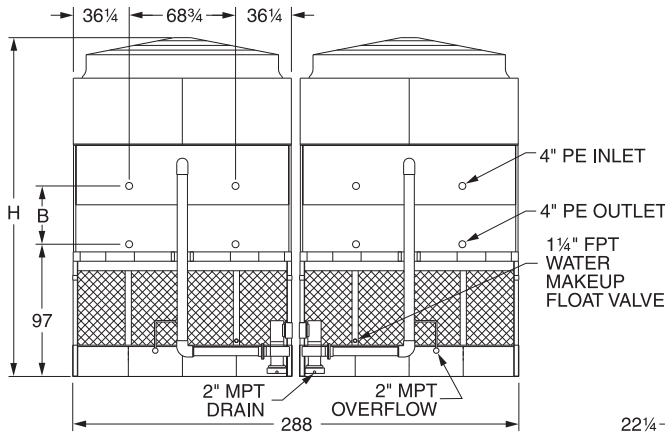
1. Fan motor HP is for free air delivery with 0" external static pressure.
2. Remote units are supplied less water-circulating pump(s), float valve(s), and related piping.
3. Values account for water in unit and piping—remote sump must also be sized for volume in field-erected spray distribution supply and drain pipes.

4. Shipping weights include water-circulating pumps.
5. Operating weights include water-circulating pump, water in the coils, and normal water operating level in the sump.

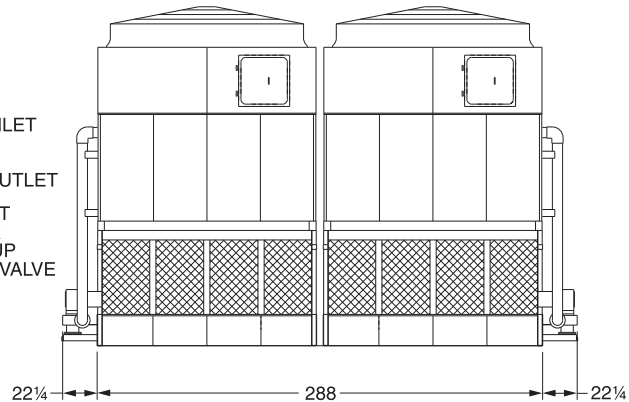
All data in this catalog is subject to change without notice.

Do not use for construction—product drawings available on request.

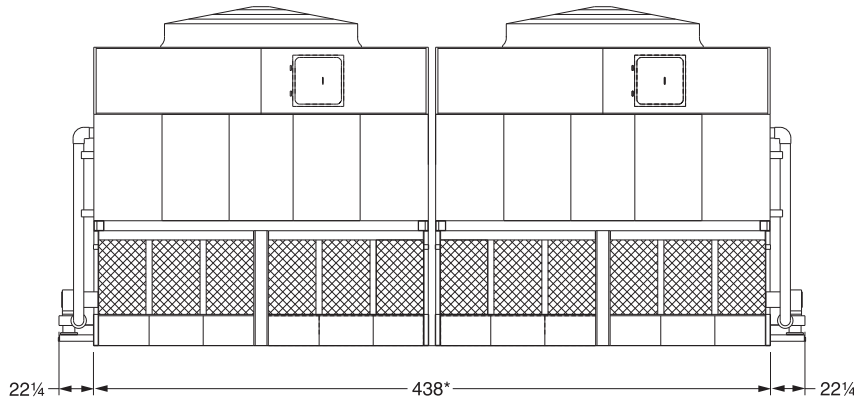
END VIEW



IDFC 1620-4Q – 2080-4Q



IDFC 2190-4Q – 3740-4Q



* 494 for 3270-4Q – 3740-4Q

IDFC Model	CFM	Fan Motor HP ⁽¹⁾	Spray Water GPM ⁽²⁾	Pump Motor HP ⁽²⁾	Remote Sump			Dimensions		Tube Coil Weights			HTR kW
					Water In	Sump Drain	Gal. ⁽³⁾ Req'd	Height H	Ctrs B	Unit ⁽⁴⁾ Ship'g	Unit ⁽⁵⁾ Operat'g	Heaviest Section	
1620-4Q	305,690	(4)15	2,860	(4)5	(4)6" PE	(4)10" PE	2,400	224	30.25	64,396	90,044	(4)11,957	(4) 6.0
1670-4Q	319,230	(4)20	2,860	(4)5	(4)6" PE	(4)10" PE	2,400	224	30.25	64,796	90,444	(4)12,057	(4) 6.0
1730-4Q	333,140	(4)25	2,860	(4)5	(4)6" PE	(4)10" PE	2,400	224	30.25	65,196	90,844	(4)12,157	(4) 6.0
1880-4Q	318,100	(4)20	2,860	(4)5	(4)6" PE	(4)10" PE	2,400	231	37.50	72,784	99,316	(4)14,054	(4) 6.0
1940-4Q	328,250	(4)25	2,860	(4)5	(4)6" PE	(4)10" PE	2,400	231	37.50	73,184	99,716	(4)14,154	(4) 6.0
2000-4Q	308,700	(4)25	2,860	(4)5	(4)6" PE	(4)10" PE	2,400	237	44.25	81,048	108,468	(4)16,192	(4) 6.0
2080-4Q	328,250	(4)30	2,860	(4)5	(4)6" PE	(4)10" PE	2,400	237	44.25	81,448	108,868	(4)19,292	(4) 6.0
2190-4Q	395,930	(4)15	4,200	(4)7.5	(4)6" PE	(4)10" PE	3,600	224	30.25	96,692	135,200	(4)17,953	(4) 9.0
2340-4Q	435,410	(4)20	4,200	(4)7.5	(4)6" PE	(4)10" PE	3,600	224	30.25	97,092	135,600	(4)18,053	(4) 9.0
2450-4Q	469,250	(4)25	4,200	(4)7.5	(4)6" PE	(4)10" PE	3,600	224	30.25	97,500	136,000	(4)18,153	(4) 9.0
2550-4Q	498,580	(4)30	4,200	(4)7.5	(4)6" PE	(4)10" PE	3,600	224	30.25	97,892	136,400	(4)18,253	(4) 9.0
2660-4Q	439,920	(4)20	4,200	(4)7.5	(4)6" PE	(4)10" PE	3,600	231	37.50	109,288	149,124	(4)21,102	(4) 9.0
2790-4Q	473,010	(4)25	4,200	(4)7.5	(4)6" PE	(4)10" PE	3,600	231	37.50	109,688	149,524	(4)21,202	(4) 9.0
2910-4Q	503,090	(4)30	4,200	(4)7.5	(4)6" PE	(4)10" PE	3,600	231	37.50	110,088	149,924	(4)21,302	(4) 9.0
3040-4Q	479,030	(4)30	4,200	(4)7.5	(4)6" PE	(4)10" PE	3,600	237	44.25	121,692	162,864	(4)24,313	(4) 9.0
3170-4Q	503,090	(4)40	4,200	(4)7.5	(4)6" PE	(4)10" PE	3,600	237	44.25	122,092	163,264	(4)24,413	(4) 9.0
3270-4Q	575,280	(4)40	4,200	(4)7.5	(4)6" PE	(4)10" PE	3,600	242	48.25	128,888	176,260	(4)24,183	(4) 12.0
3370-4Q	532,800	(4)30	4,200	(4)7.5	(4)6" PE	(4)10" PE	3,600	249	56.00	140,492	189,200	(4)27,833	(4) 12.0
3540-4Q	575,280	(4)40	4,200	(4)7.5	(4)6" PE	(4)10" PE	3,600	249	56.00	140,972	189,680	(4)27,953	(4) 12.0
3610-4Q	620,500	(4)50	4,200	(4)7.5	(4)6" PE	(4)10" PE	3,600	249	56.00	141,330	190,038	(4)28,013	(8) 12.0
3740-4Q	620,500	(4)50	4,400	(4)10	(4)6" PE	(4)10" PE	3,600	249	56.00	141,372	190,080	(4)28,013	(8) 12.0

1. Fan motor HP is for free air delivery with 0" external static pressure.
2. Remote units are supplied less water-circulating pump(s), float valve(s), and related piping.
3. Values account for water in unit and piping—remote sump must also be sized for volume in field-erected spray distribution supply and drain pipes.

4. Shipping weights include water-circulating pumps.
5. Operating weights include water-circulating pump, water in the coils, and normal water operating level in the sump.

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IDFC OPTIONAL EQUIPMENT

HOT DIP GALVANIZED AFTER FABRICATION

Johnson Controls stands alone in offering the premium corrosion protection of *Hot Dip Galvanized After Fabrication*. As an option, all casing components and fan sections can be galvanized after fabrication. This provides maximum corrosion protection for all components.

FAN LEVEL HANDRAIL

A handrail, designed to surround the top of the unit, can be provided as a safety measure when it is necessary to access the fan or the motor from atop the IDFC series fluid cooler.

JIB BOOM ASSIST FOR OVERHEAD MOTOR ACCESS

The induced draft design of the IDFC requires that the motor be located at the top of the unit. Given the motor size and weight, a jib boom assist is offered to swing the motor from its mounted position up and out over the fluid cooler installations. A single jib boom can be provided, attached, and removed to service all of the fluid coolers.

CAPACITY CONTROL ALTERNATIVES (TWO-SPEED MOTORS AND VARIABLE FREQUENCY DRIVES)

For energy savings and capacity control, we offer alternatives to the conventional single-stage cycling of the IDFC motors.

Through the application of an optional two-speed motor, we can provide 100% full rated capacity (fan on - high speed), 60% capacity (fan on - low speed), or 10% capacity (fan off) in a controlled sequence of operation, based on load conditions.

Alternatively, through the application of our optional variable frequency drives and optional heavy-duty VFD motors, fluid cooler fan operation can be controlled through an infinite number of steps of motor capacity.

MULTICIRCUITED COILS

Fluid cooler coils can be divided into multiple circuits to satisfy most system requirements.

ELECTRIC WATER LEVEL CONTROL

Where close control of the integral basin water level is required, we can provide an electric water level control system consisting of a weather-protected electric float switch and a weather-protected solenoid valve factory wired to a NEMA 4 junction box.

PAN WATER HEATERS

Stainless steel, sheath-type electric immersion heaters can be provided to supply sufficient heat to the integral basin to prevent freeze-up of basin water. Thermostatically controlled, the heater includes a low-water-level cutout switch that prevents heater operation with insufficient water in the basin.

SOLID-STATE VIBRATION CUTOFF SWITCH

One NEMA 4 solid-state vibration cutoff switch for each fan motor of unit. Switch is designed to operate on 120-1-60 voltage. Each switch is furnished with one trip for alarm or shutdown. Vibration cutoff switch(es) is shipped loose with unit(s) and requires field installation on unit(s).

MECHANICAL VIBRATION CUTOFF SWITCH

One NEMA 4 weatherproof mechanical vibration cutoff switch for each fan motor of unit. Vibration cutoff switch is shipped loose with unit(s) and requires field installation on unit(s).

SERVICE PLATFORM

A platform may be cantilevered from the unit providing service access to the spray headers and mist eliminators.

VIBRATION ISOLATORS

Where building codes require vibration isolation, spring-type vibration isolators, with or without rails, can be furnished to properly isolate the equipment from the mounting structure.

COIL CONNECTIONS

Evaporative fluid coolers can be supplied with MPT, Victaulic groove, flanged, or copper sweat coil connections when required.

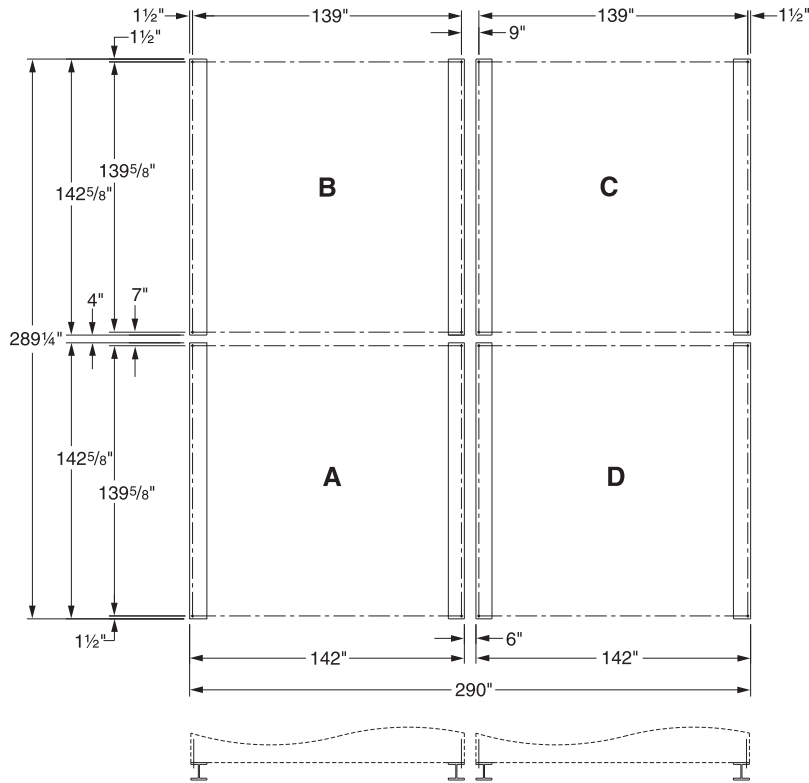
Contact your local sales representative or the factory for complete details.

CONTROL PANEL

To minimize design engineering and field wiring, single-point electrical connections are offered with all the necessary components in a control panel. Panels include: main disconnect(s), individual fusing of all major components, motor starters with 3-phase overload protection, 120 volt single-phase control voltage transformer, Hand-Off-Auto switch for both manual and automatic startups, terminal strip with custom wiring for stage controllers, and a NEMA-4 enclosure.

Contact your local sales representative or the factory for your specific design applications.

IDFC PLATFORM LAYOUT

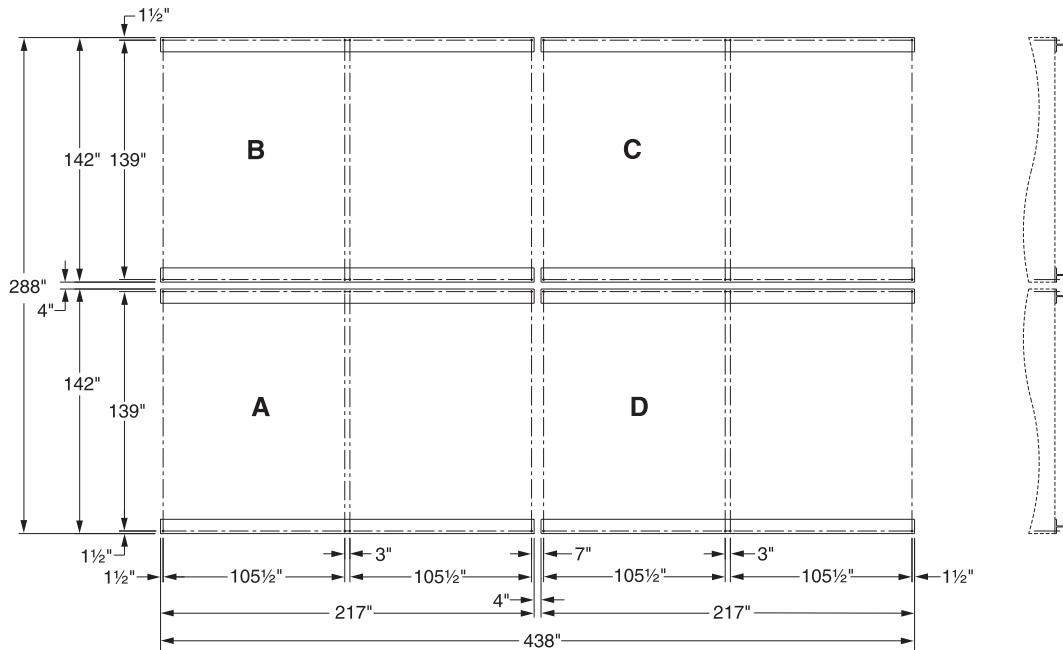


IDFC 420 – 540; 840-2E – 1080-2E; 840-2S – 1080-2S; 1620-4Q – 2080-4Q

MODEL	APPLICABLE CELLS	OVERALL	
		LENGTH	WIDTH
420 – 540	A	142-5/8"	142"
840-2S – 1080-2S	A D	142-5/8"	290"
840-2E – 1080-2E	A B	289-1/4"	142"
1620-4Q – 2080-4Q	A B C D	289-1/4"	290"

**Do not use for construction purposes - detailed drawings available on request.
Dimensions are in inches.**

IDFC PLATFORM LAYOUT



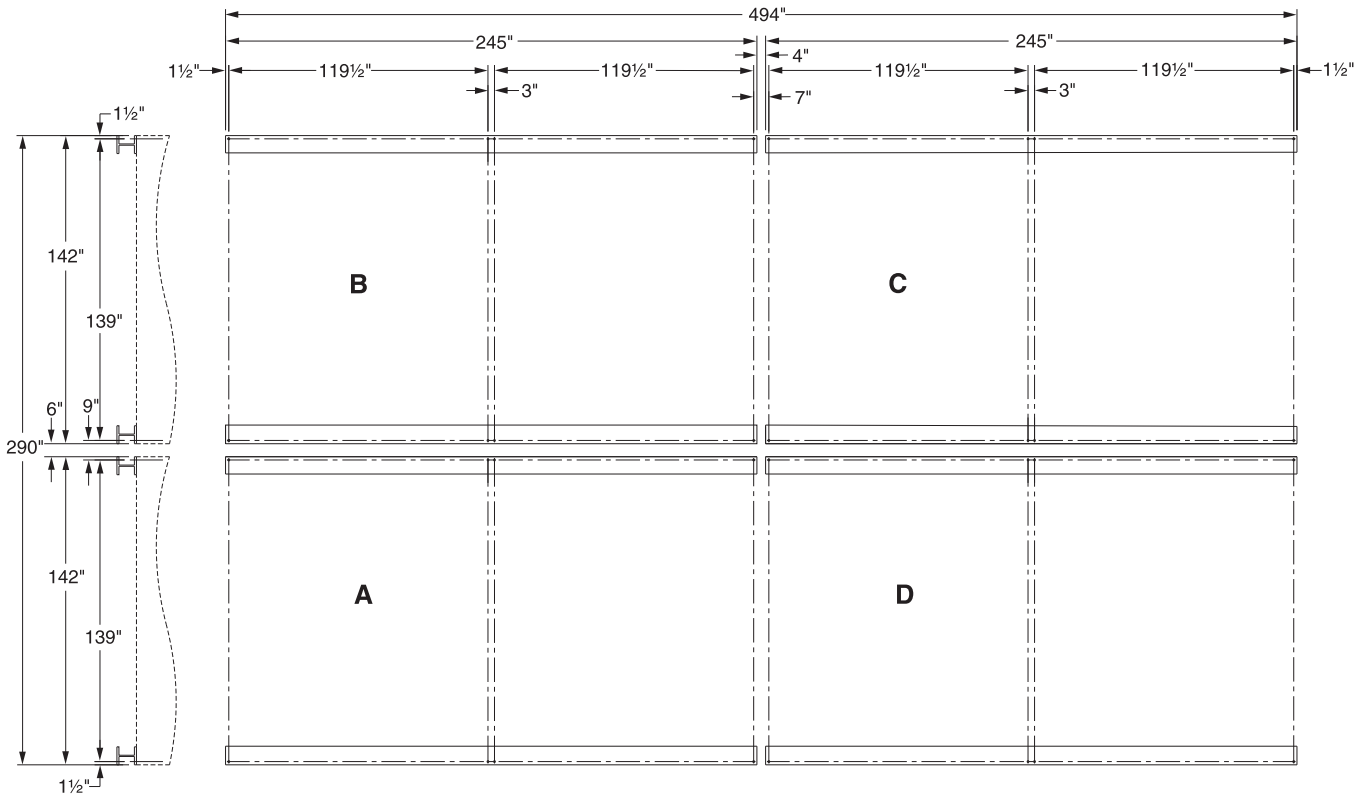
IDFC

IDFC 575 – 835; 1150-2E – 1670-2E; 1120-2S – 1620-2S; 2190-4Q – 3170-4Q

MODEL	APPLICABLE CELLS	OVERALL	
		LENGTH	WIDTH
575 – 835	A	217"	142"
1120-2S – 1620-2S	A B	217"	288"
1150-2E – 1670-2E	A D	438"	142"
2190-4Q – 3170-4Q	A B C D	438"	288"

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Dimensions are in inches.**

IDFC PLATFORM LAYOUT



IDFC 870 – 990; 1740-2E – 1980-2E; 1690-2S – 1920-2S; 3270-4Q – 3740-4Q

MODEL	APPLICABLE CELLS	OVERALL	
		LENGTH	WIDTH
870 – 990	A	245"	142"
1690-2S – 1920-2S	A B	245"	290"
1740-2E – 1980-2E	A D	494"	142"
3270-4Q – 3740-4Q	A B C D	494"	290"

**Do not use for construction purposes - detailed drawings available on request.
Dimensions are in inches.**