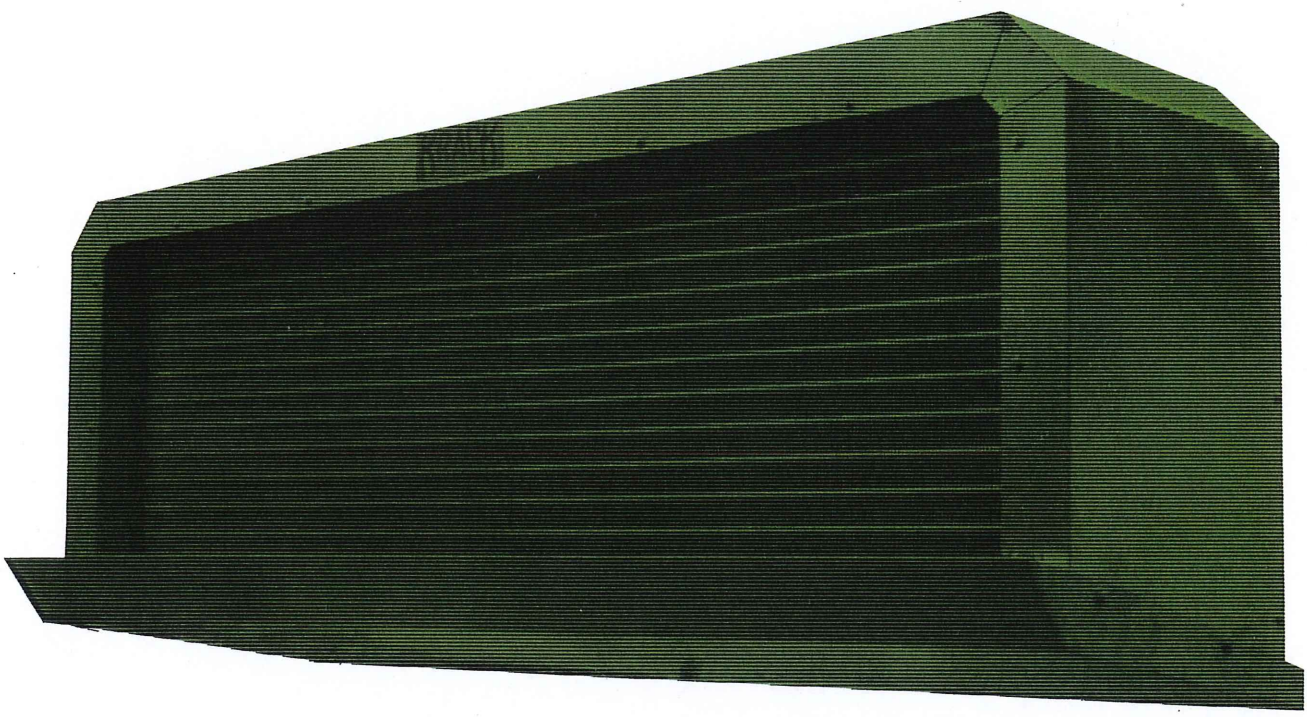
MA & WD Series
Bulletin: MA-WD-179
January 1, 1979
Supersedes: MA-574
WD-866 & IE

KRACK

MA & WD Series Blow Thru Unit Coolers



Air, Water or Hot Gas Defrost.
12-MA and 16-WD Models from 47,250 to 142,000 BTUH/10°TD
MA for rooms above 32°F. WD for Rooms above 20°F.
Ammonia, Halocarbon & Brine Refrigerants

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SPECIFICATIONS

MODEL	CAPACITY BTUH/1°TD (1) WET DX	WET REC	FROSTED DX	FROSTED REC	COIL DATA FINS INCH	SURFACE SQ. FT.	INT VOL CU FT	DXF LBS	AIR DATA CFM	FACE FPM	FAN MOTOR ELECTRICAL DATA (2) FANS NO-HP	TOTAL AMPACITY—60 HERTZ 208/1	230/1	230/3	460/3	SOUND LEVEL dB(A)	APPROX WT-LBS STEEL COIL	COPPER COIL
MA3-5200	5200	6250	4725	5620	3	1134	1.7	52	11100	625	3-⅓	10.0	9.0	5.1	2.7	67	1150	790
MA3-5400	5400	6480	4905	6080	4	1451	1.7	55	10725	603	3-⅓	10.0	9.0	5.1	2.7	67	1240	850
MA3-5840	5840	7010	5255	6310	6	2087	1.7	59	10000	563	3-½	13.0	11.7	6.0	3.0	68	1460	1000
MA4-6750	6750	8100	6130	7360	3	1507	2.2	67	14240	614	4-⅓	NA	12.0	6.8	3.6	67	1640	1080
MA4-7300	7300	8760	6630	7960	4	1927	2.2	71	13760	593	4-⅓	NA	12.0	6.8	3.6	67	1760	1140
MA4-7900	7900	9480	7100	8530	6	2771	2.2	76	12800	552	4-½	NA	NA	8.0	4.0	69	2080	1350
MA5-8400	8400	10080	7640	9160	3	1879	2.8	83	17800	616	5-⅓	NA	NA	8.5	4.5	68	2050	1340
MA5-9100	9100	10920	8275	9930	4	2403	2.8	88	17200	595	5-⅓	NA	NA	8.5	4.5	68	2200	1430
MA5-9850	9850	11820	8865	10640	6	3456	2.8	100	16000	553	5-½	NA	NA	10.0	5.0	70	2600	1690
MA6-10085	10085	12100	9170	11000	3	2255	3.5	100	21360	616	6-⅓	NA	NA	10.2	5.4	69	2460	1610
MA6-10925	10925	13100	9935	11920	4	2884	3.5	106	20640	595	6-⅓	NA	NA	10.2	5.4	69	2640	1720
MA6-11825	11825	14200	10640	12780	6	4147	3.5	120	19200	553	6-½	NA	NA	12.0	6.0	71	3120	2030
WD3-4725	5200	6250	4725	5680	3	1134	1.7	52	11100	625	3-⅓	10.0	9.0	5.1	2.7	67	1220	830
WD3-4905	5400	6480	4905	6080	4	1451	1.7	55	10725	603	3-⅓	10.0	9.0	5.1	2.7	67	1300	890
WD3-5295	5825	6985	5295	6350	3	1134	1.7	53	14070	808	3-½	13.0	11.7	6.0	3.0	68	1240	850
WD3-5360	5895	7085	5360	6440	4	1451	1.7	57	12500	718	3-½	13.0	11.7	6.0	3.0	68	1320	910
WD4-6130	6750	8100	6130	7360	3	1507	2.2	67	14240	614	4-⅓	NA	12.0	6.8	3.6	67	1730	1140
WD4-6630	7300	8760	6630	7960	4	1927	2.2	71	13760	593	4-⅓	NA	12.0	6.8	3.6	67	1850	1200
WD4-6850	7550	9100	6850	8230	3	1507	2.2	69	18000	776	4-½	NA	NA	8.0	4.0	69	1760	1170
WD4-7100	7810	9370	7100	8525	4	1927	2.2	73	16000	689	4-½	NA	NA	8.0	4.0	69	1880	1230
WD5-7640	8400	10080	7640	9160	3	1879	2.8	83	17800	616	5-⅓	NA	NA	8.5	4.5	68	2160	1410
WD5-8275	9100	10920	8275	9930	4	2403	2.8	88	17200	595	5-⅓	NA	NA	8.5	4.5	68	2310	1500
WD5-8575	9430	11320	8575	10300	3	1879	2.8	86	22500	778	5-½	NA	NA	10.0	5.0	70	2200	1450
WD5-8860	9745	11695	8860	10620	4	2403	2.8	90	20000	692	5-½	NA	NA	10.0	5.0	70	2350	1540
WD6-9170	10085	12100	9170	11000	3	2255	3.5	100	21360	616	6-⅓	NA	NA	10.2	5.4	69	2590	1690
WD6-9935	10925	13100	9935	11920	4	2884	3.5	106	20640	595	6-⅓	NA	NA	10.2	5.4	69	2770	1800
WD6-10295	11325	13590	10295	12360	3	2255	3.5	103	27000	778	6-½	NA	NA	12.0	6.0	71	2640	1740
WD6-10635	11700	14045	10635	12760	4	2884	3.5	109	24000	692	6-½	NA	NA	12.0	6.0	71	2820	1850

(1) ***Capacity*** is based on sensible heat removal with a wet, dry, or frosted coil with TD's less than 20 Deg.F. Wet coil heat transfer is more efficient than frosted resulting in higher ratings. Dry ratings are between wet and frosted, however, refrigeration coils seldom operate dry. Although rated for sensible heat, a unit cooler will absorb the room total load consisting of both sensible and latent if the TD is adequate for the rated CFM. Flooded ratings are the same as recirculated.

Fan motor heat is not included in the ratings and is usually included in the load estimate (Coolers-4,000 BTUH/HP).

TD is the temperature difference between return or room air and coil saturated suction temperature.

Brine systems. Consult the factory for ratings. Provide required capacity, type of brine and concentration, brine and room temperatures, and GPM. Calcium chloride requires steel coils. Glycols use copper tube/aluminum fin coils.

50 Hertz results in a fan motor RPM decrease of 17%. Derate unit capacity 12% to compensate.

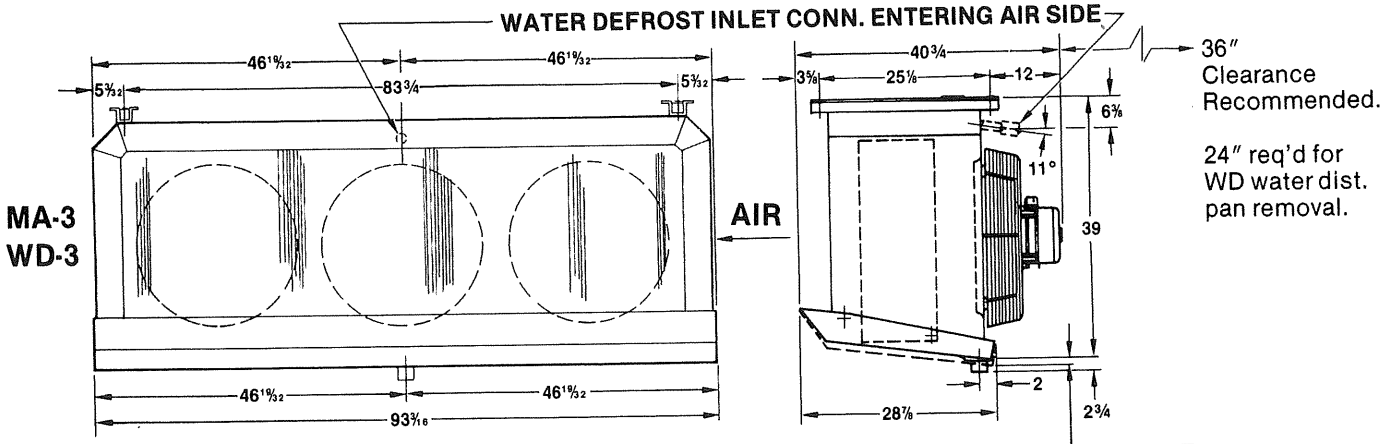
(2) ***NA*** indicates motor circuit exceeds 15 amps at 600 volts and 20 amps at 125 volts or less. Ampacity will increase as room temperature is lowered (8% at 32°F.).

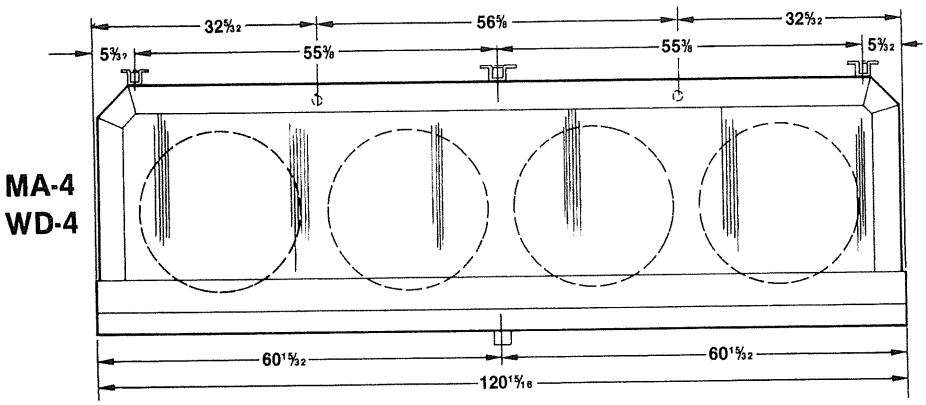
(3) ***Relative sound pressure*** is in decibels on the "A" scale, measured 6 feet in front of the unit. Actual sound level is dependent upon unit location, room size and height and surface "hardness" of walls, ceiling and product.

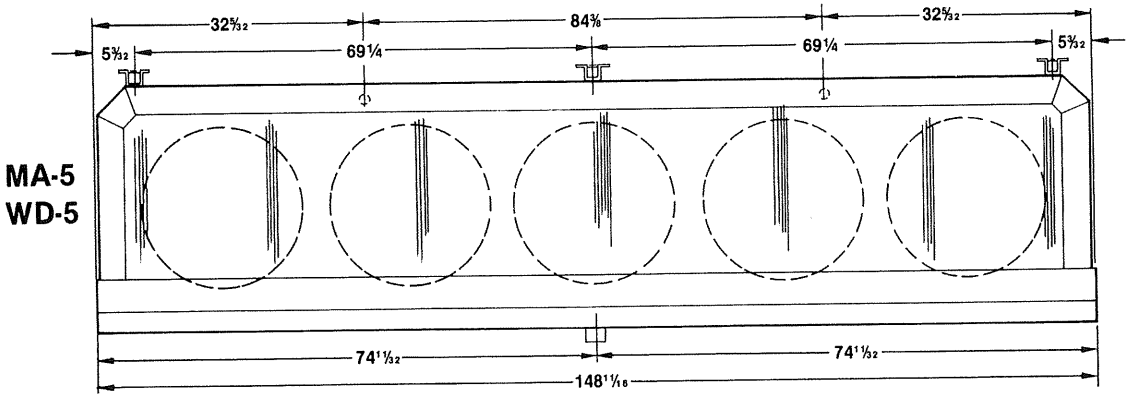
Ordering Instructions: When ordering, be certain that *all* of the following information is furnished:

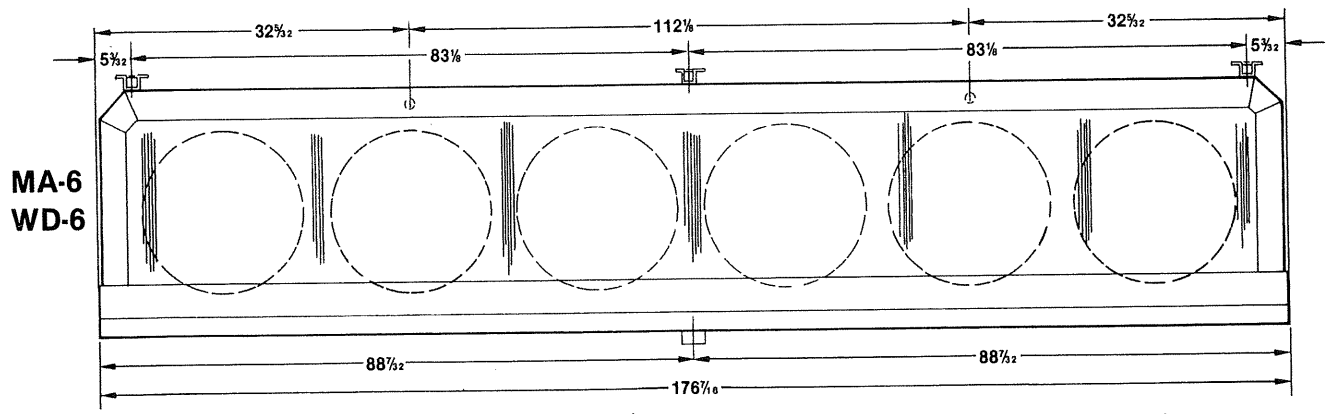
1. Quantity
2. Complete model number
3. Electrical characteristics
4. Suction temperature
5. Room temperature
6. Options/accessories

PHYSICAL DATA









This drawing is for general reference. Do not use for construction purposes.

CONNECTION SIZES

REFRIGERANT AND DRAIN PAN CONNECTIONS—INCHES

FEED	DXF		DXA		RTF		RTA		RBA		FLA		OPTIONAL HGC		DRAIN PAN	
MODEL	L ODS	S ODS	L F	S M	L ODS	S ODS	L M	S M	L M	S M	L M	S M	DXF SIDE PORT ODS	DXA HEADER MPT	FPT MA	FPT WD
MA-WD 3	7/8	1 5/8	1/2	1	1 1/8	2 1/8	3/4	1 1/2	3/4	1 1/2	1 1/2	2	7/8	3/4	1	2
MA-WD 4	1 1/8	1 5/8	1/2	1	1 1/8	2 1/8	3/4	1 1/2	3/4	1 1/2	2	2 1/2	1 1/8	1	1 1/4	2 1/2
MA-WD 5	1 1/8	2 1/8	1/2	1 1/4	1 3/8	2 5/8	3/4	2	3/4	2	2	2 1/2	1 3/8	1	1 1/4	2 1/2
MA-WD 6	1 3/8	2 1/8	1/2	1 1/4	1 3/8	2 5/8	1	2	1	2	2 1/2	2 1/2	1 3/8	1	1 1/4	2 1/2

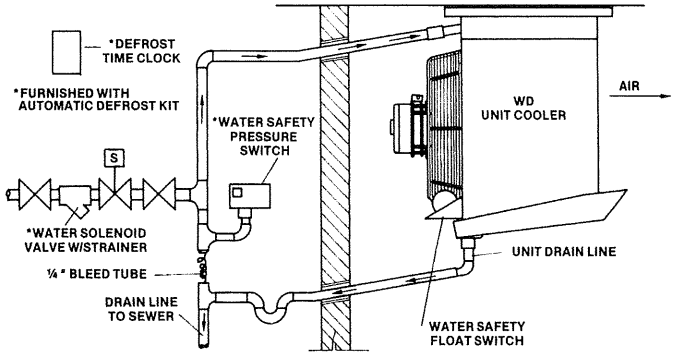
WATER DEFROST DATA

WD MODEL	DEFROST GPM	CONN FPT
WD3-4725- 5295	22	1@1
WD3-4905- 5360	24	
WD4-6130- 6850	26	2@1
WD4-6630- 7100	28	
WD5-7640- 8575	30	2@1
WD5-8275- 8860	32	
WD6-9170-10295	35	2@1
WD6-9935-10635	37	

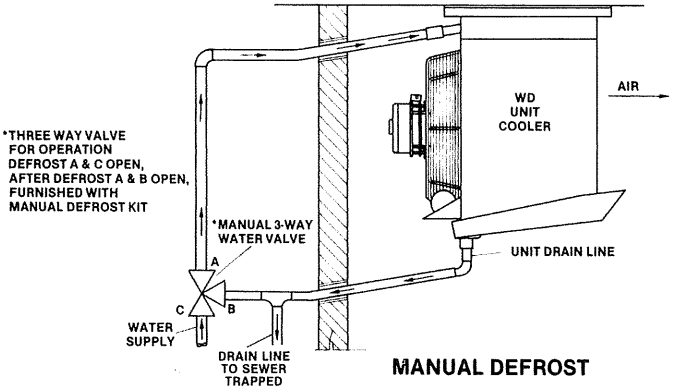
30% ETHYLENE GLYCOL DATA FOR 32°F ROOM

WDC-MODEL	GLYCOL TEMP °F ENT	LVG	GLYCOL GPM	PSI DROP	CAPACITY BTUH	CONN INCHES
WDC3- 5360	17	20.1	50	1.7	70,356	2@2 5/8
WDC4- 7100	17	21.0	50	2.3	89,279	2@2 5/8
WDC5- 8860	17	21.9	50	2.9	110,300	2@2 5/8
WDC6-10635	17	22.6	50	3.4	125,112	2@2 5/8

WATER DEFROST ARRANGEMENTS



AUTOMATIC DEFROST



MANUAL DEFROST

Model Key

MA4C— 7900—DXF—22—HGC—RH
WD6C—10295—B

BLOW THRU MODEL
MA—Air Defrost
WD—Water Defrost

NO FANS

COPPER TUBE-AL/FIN
Omit for steel coil

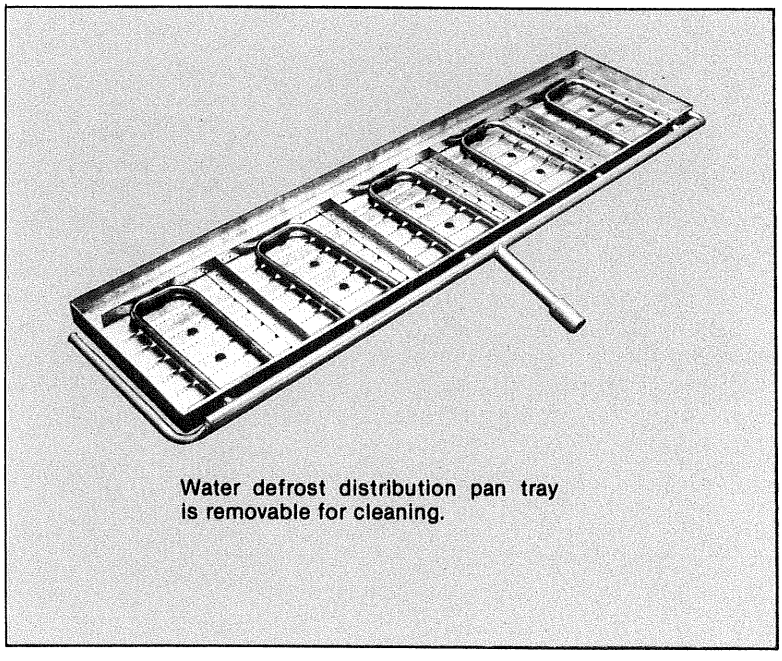
CAPACITY BTUH/°TD

REFRIGERANT FEED
DX—Direct Expansion
RT—Recirculated Top Feed
RB—Recirc.-Bottom Feed
FL—Flooded
B—Brine-CW—Chilled Water

REFRIGERANT
F—Halocarbons R12, 22 or 502
A—Ammonia

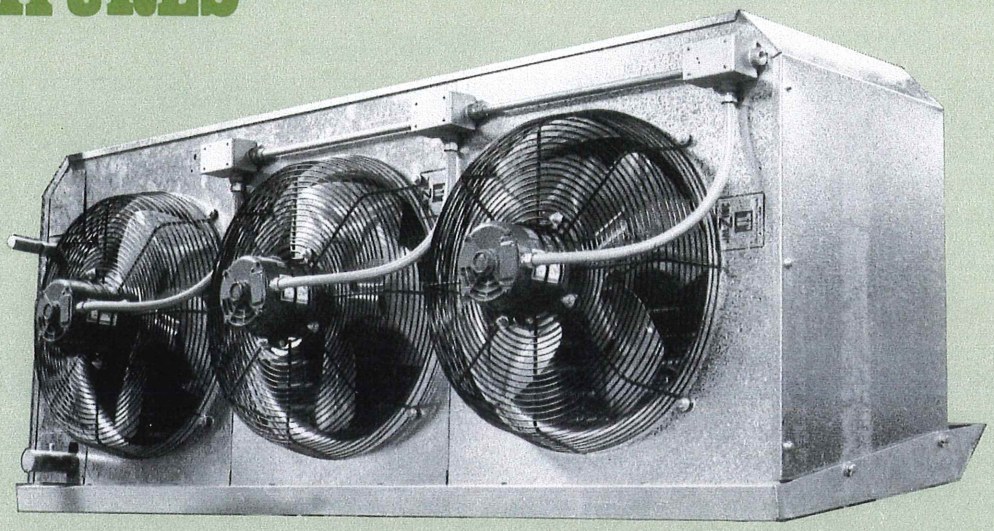
TYPE OF DEFROST-OPTIONAL
HGC—Hot gas coil only (Room above 32°F.)

COIL CONNECTION HAND-facing air discharge
RH—Right hand
LH—Not available



Water defrost distribution pan tray is removable for cleaning.

FEATURES



Coil

Maximum heat transfer is achieved by staggering 3/4 OD tubes in the direction of air flow. Coils are 6 rows deep with 3, 4, or 6 fins per inch. Fins are spaced by Turbo-spacers.

Coils for ammonia or calcium chloride brines are constructed of steel tubes and steel fins which are hot dip galvanized after fabrication. Steel coils for halocarbon DXF fed systems use copper distributors. Coils for DXA-HGC ammonia hot gas defrost systems are provided with a hot gas header which by-passes the steel distributor.

Coils for halocarbon or glycol brines are constructed of copper tubes with aluminum fins. DXF-HGC hot gas defrost models for halocarbon refrigerants are provided with a side ported distributor for hot gas entrance to the coil.

Housing

Corrosion resistant heavy gauge mill galvanized steel is used for all MA-WD housings. Adjustable vertical discharge louvres are optional on MA units.

Drain pan

MA-WD units feature full coverage aluminum pans with external lips to catch possible external condensation. Additionally, the units are designed to direct discharge air upward. Options include insulated drain pans with foamed-in-place polyurethane insulation and mill galvanized covers. Drain pans are shipped loose for field mounting.

Fans and motors

The MA-WD Series is engineered with fully guarded, large diameter fans with 22 inch blades. Fans are direct driven by slow speed 1140 RPM motors. Motors are TENV construction with built-in thermal overload protection for both single and three phase service. As an option, motors can be factory wired to junction boxes which are interwired so that the electrical service connection is opposite to refrigerant connections. All motors on one unit can be cycled with one contactor and external overload devices are not required. Air throw is 40 to 60 feet depending on ceiling height and freedom from interference.

ACCESSORIES & OPTIONS

- Thermostatic expansion valve.
- Liquid line solenoid valve with strainer.
- Suction liquid heat exchanger for halocarbon refrigerants.
- Fan motors factory wired to common JB.
- Factory mounted fan motor disconnect means.
- Foamed-in-place polyurethane insulated drain pans with galvanized bottom cover.
- Hot gas defrost of coil only for MA-HGC and WD-HGC models.
- Hot gas defrost control valve kits.
- Factory fitted surge drum assemblies for FLA ammonia models (shipped loose).
- Adjustable vertical air discharge louvres for MA models.
- Water defrost control kits—manual or automatic for WD models.

APPLICATION

Blow-Thru MA Models are designed for wet coil operation or for air or off-cycle defrost in rooms above 34 Deg.F. Optional, MA-HGC models are for hot gas defrost in rooms above 32 Deg.F as the drain pan is not heated.

Fans must operate to air defrost a frosted coil. The liquid feed solenoid valve is de-energized periodically by a time clock to create the air defrost condition. A suction line back pressure regulator, capable of a higher setting during defrost, is recommended for recirculated or flooded fed units. The higher pressure setting (corresponding to 50 Deg.F) will allow the refrigerant in the coil to warm up in lieu of consuming defrost time while boiling off.

Optional MA-HGC models use hot gas for rapid defrost. For RTF or RTA feeds, the hot gas is injected between the hand expansion valve and the coil. DXA feeds have a hot gas header which by-passes the distributor leads. DXF-HGC models are provided with a side-ported distributor for hot gas entrance. In all cases, a check valve is required in the hot gas feed line and a back pressure regulator is required in the suction line to raise the defrost pressure to corespond to 45-50 Deg.F.

MA units for combination cooling or heat reclaim should have bottom feed with recirculated ammonia application. With DXA feeds the hot gas for heating can enter the by-pass header.

Blow-Thru WD Models with water defrost are to be applied in rooms above 20 Deg.F. Water defrost is not recommended for freezers. Usually water defrost is applied when defrost requirements are minimal or a periodic water flushing is required to clean the coil.

WD models are circulated for DXF, DXA, RTF, RTA, and FLA feeds and for brines. As an option, WD models can be provided for a combination of hot gas and water defrost. The hot gas entrance to the coil is the same as described for MA models.

The basic water defrost cycle starts by stopping fans and refrigerant feed. Water is then supplied to the distributing defrost pan. Placement of the pans above the coil element provides maximum coverage of the fin surfaces and coil return bends. Pans are easily removed for cleaning.

After the defrost water has removed the frost, the water supply is stopped. A period of delay is required to allow the defrost water to leave the unit before resuming the refrigerant cycle.

Following the delay period, the refrigeration valves are opened, the fan motors are started and the cooling cycle is resumed with a completely defrosted coil.

Defrost controls are furnished as optional extras. A manual 3-way water control valve or an automatic water defrost kit is available. The automatic kit consists of a defrost time clock, water safety pressure switch, high level float switch mounted on the unit, and a water solenoid valve.

KRACK®

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