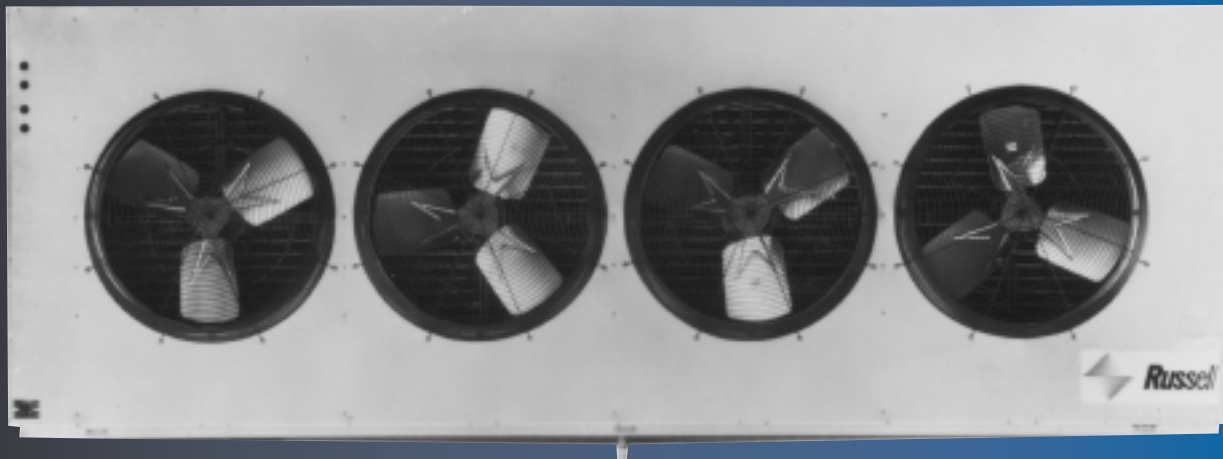


## Heavy Duty Unit Cooler

Publication No. 101.8  
February, 2009



Air Defrost - 16,400 to 273,000 BTUH  
Electric Defrost - 11,800 to 248,000 BTUH  
Hot Gas Defrost - 11,800 to 248,000 BTUH

Large Walk-Ins  
and Warehouses

Cooler & Freezer  
Applications

## Features

**APPLICATION** - Ultra-Temp unit coolers are ideally suited for a wide range of large coolers, freezers and blast freezers. The **U\*U** and **U\*L** models are designed for use below +25°F room temperature. The **U\*M** and **UAH** models are designed for coolers in the medium and high temperature ranges.

**SIZES** - There are 61 sizes available, ranging in capacity from 11,800 to 273,000 BTUH @ 10°TD, and ranging in air flow from 2,720 to 29,900 CFM.

**HOUSING** - Rust-free, heavy gauge textured Aluminum; lightweight and durable. Air and electric defrost models have hinged drain pans to allow for convenient servicing and maintenance (Hot Gas drain pans are not hinged).

**LIFTING LEGS** - 2 fan models and larger are shipped upright with removable lifting legs, allowing the unit to be installed quickly, and easily with a forklift. Slotted hangers are provided for fast installation.

**COIL** - Seamless copper tubes are mechanically expanded into heavy gauge corrugated Aluminum fins to assure maximum heat transfer. Die formed fin collars are provided for accurate fin spacing. Hangers are fastened directly to the tube sheets of the coil to provide high structural strength. All units are dehydrated, sealed and shipped with a nitrogen holding charge.

**REFRIGERANTS** - For use with direct expansion, R-22, R-404A, R-502 and R-507. Specify refrigerant when ordering. A separate compartment is provided for all refrigeration connections, allowing ample room for internal mounting of expansion valve(s). Ultra-Temps can also be used for chilled water or glycol solutions, contact factory for selection.

**FANS** - Powerful, heavy-duty Aluminum fans are individually balanced to provide vibration-free operation. Wire fan guards are epoxy coated for corrosion resistance. Optional air straighteners are available for increased air throw.

**MOTORS** - All standard motors are high efficiency PSC, ball bearing type, life lubricated and thermally protected. **U\*U** and **U\*L** models use 3/4 HP, 1075 RPM or 3/4 HP, 1625 RPM motors. **U\*M** and **UAH** models use 1/3 HP or 3/4 HP, 1075 RPM motors. Optional EC motors are now available for all Ultra-Temp models.

**ELECTRICAL** - Available in 115/1, 208/230/1, 208/230/3, 460/1 and 460/3 (see page 10). Ultra-Temps can also be operated on 220/1/50, 220/3/50, 380/1/50, and 380/3/50 power (contact factory for details). All components are factory wired to convenient screw-type terminal blocks. A large compartment is supplied for all electrical components and is easily accessible by removing the end panel.

**AIR DEFROST** - Available on **UAM** and **UAH** series only for use in coolers at +35°F and above. Complete Air Defrost systems are available from Russell.

**ELECTRIC DEFROST** - Available on all but the **UAH** models. Placement of the heaters within the refrigeration coil allow for a more efficient and rapid defrost cycle. This arrangement enables heat to be conducted from the center of the core out, for a more even defrost pattern. All heaters are factory wired to screw-type terminal blocks, allowing for a quick field change over from 1 to 3 phase or 230V to 460V and vice versa with the use of jumpers. An adjustable, remote bulb defrost termination and fan delay (DTFD) is mounted and wired. Drain pans are heated for fast, reliable drainage. Timer and contactors are available as options, see page 11. Complete Electric Defrost systems are available from Russell.

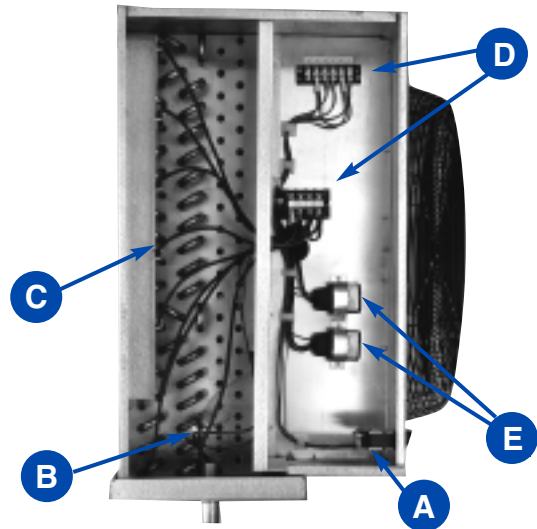
**HOT GAS RE-EVAP DEFROST** - Available on all but the **UAH** models. Includes an adjustable defrost termination and fan delay (DTFD), factory installed. A hot gas drain circuit is supplied, thus eliminating the need for electric heat and additional wiring. A Heat Exchanger/Re-Evaporator is supplied with every unit. Refer to the current Technical Bulletin HG for piping. Complete Hot Gas Re-Evap systems are available from Russell, contact factory.

**HOT GAS REVERSE CYCLE DEFROST** - Available on all but the **UAH** models. Includes an adjustable defrost termination and fan delay. (DTFD) factory installed. A hot gas drain pan circuit is supplied, thus eliminating the need for electric heat and additional wiring. Refer to the current Technical Bulletin HG For piping. This unit is also used for Alternating Evaporator Systems.

## ***Electric Defrost***

### Electrical Compartment

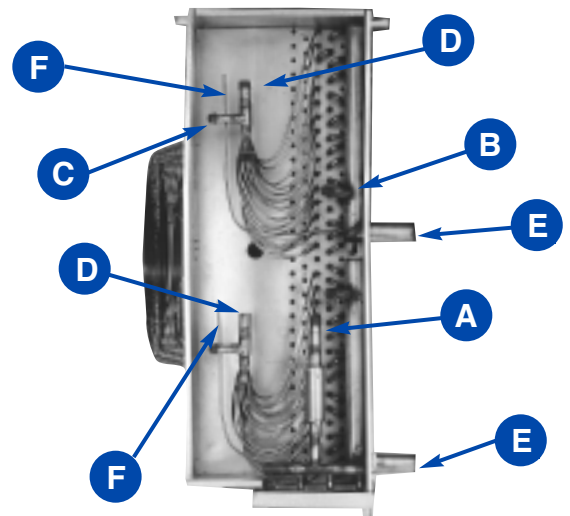
- A. Defrost control (DTFD)
- B. DTFD sensing bulb
- C. Fin heater (typical)
- D. Field wiring terminal strips
- E. Fan motor capacitors



## ***Refrigerant Connection*** ***Compartment***

### Refrigerant End Compartment (Larger two-circuit Hot Gas coil shown)

- A. Hot gas supply (from drain pan)
- B. Hot gas inlet to coil (two-pipe)
- C. Hot gas inlet to coil (three-pipe)  
Hot gas outlet from coil (two-pipe)
- D. Liquid inlet from TX valve
- E. Suction connection
- F. External equalizer line



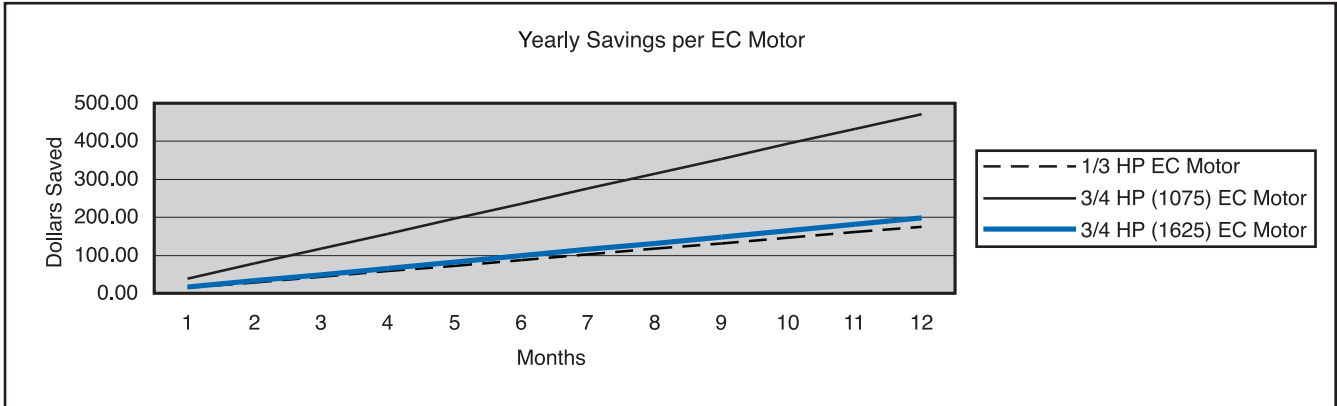
## ***Options***

- Copper fins.
- Coated fins (air and hot gas models only).
- Galvanized steel casing.
- High pressure propeller fans (up to 0.5" external pressure).
- Inherent 3 phase motors.
- Ultra low temperature motor grease for applications down to -60°F suction temperature.
- Insulated drain pans.
- Custom circuiting for chilled water or glycol applications.
- High air throw fan guards.

## Energy Saving per Motor

by Changing to more Efficient Unit Cooler Motors (based on Energy Cost of \$0.10 per kWh)

Motor HP and RPM	Standard PSC Motor Input Power Watts/Mtr	Optional EC Motor Input Power Watts/Mtr	Reduced Power Consumption Watts/Mtr	Run Time Hrs/Day	Motor Energy Savings kWh/Yr	Motor Energy Savings \$/Yr	Reduced Box Load MBTU/Yr	Cond. Unit Energy Savings kWh/Yr	Cond. Unit Energy Savings \$/Yr	Yearly Savings \$/Motor	Pay-back Yrs
1/3 1075	357	225	132	22	1060	106	3,617	695	70	176	0.9
3/4 1075	850	495	355	22	2851	285	9,726	1,870	187	472	0.4
3/4 1625	717	580	137	22	1100	110	3,754	722	72	182	1.0

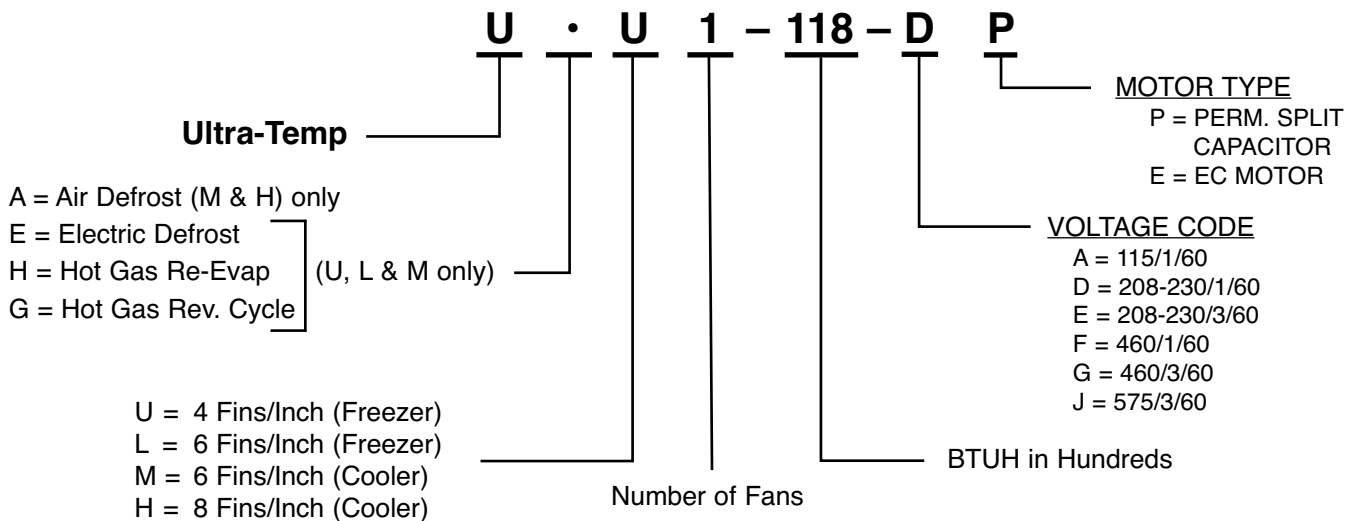


## Air Throw

Air throw is affected by installation variables. Optimum air throw is obtained by high ceiling with no interference from beams, product or return air restrictions.

MODEL	WIRE FAN GUARD	FAN GUARD / AIR STRAIGHTENER
U*U / U*L U*M / UAH	60 - 80 feet 50 - 70 feet	80 - 100 feet 70 - 90 feet

## Nomenclature



## Performance Data

F R E E Z E R	4 F P I	MODEL NUMBER	CFM	CAPACITY BTUH @ 10°TD (404A, R-22)			
				SUCTION TEMPERATURE			
				-30°F	-20°F	-10°F	+10°F
		U*U1-118	3750	11800	12400	12900	14000
		U*U2-236	7500	23600	24700	25700	27900
		U*U2-355	8200	35500	37100	38700	42100
		U*U3-474	12450	47400	49500	51600	56100
		U*U4-711	16400	71100	72800	74500	81000
		U*U4-851	21600	85100	89000	92800	100900
		U*U4-1080	21600	108000	112900	117700	128000
		U*U5-1350	26200	135000	141000	147000	160000
		U*U6-1620	32400	162000	176600	176600	192000

F R E E Z E R	6 F P I	U*L1-125	3750	10900	11700	12500	13500
		U*L1-152	3650	13200	14200	15200	16400
		U*L1-193	3550	16800	18100	19300	20800
		U*L2-240	7600	20900	22400	24000	25900
		U*L2-304	7300	26400	28400	30400	32800
		U*L2-361	8300	31400	33800	36100	39000
		U*L2-408	8100	35500	38200	40800	44100
		U*L3-445	12800	38700	41600	44500	48000
		U*L3-540	12450	47000	50500	54000	58300
		U*L3-613	12150	53300	57300	61300	66200
		U*L3-660	11800	57400	61700	66000	71200
		U*L4-722	16600	62700	67500	72200	78000
		U*L4-817	16200	71100	76400	81700	88200
		U*L4-950	21500	82500	88900	95000	102600
		U*L4-1100	21200	95700	102900	110000	118800
		U*L4-1260	20800	109600	117800	126000	136000
U*L4-1380	20400	120000	129000	138000	149000		
U*L5-1575	26000	137000	147300	157500	170000		
U*L5-1725	25500	150000	161300	172500	186300		
U*L6-1890	31200	164400	176700	189000	204000		
U*L6-2070	32100	180000	193500	207000	223500		

R E M O O L E R	6 F P I	MODEL NUMBER	CFM	CAPACITY BTUH@10°TD +20°F
		U*M1-164	2920	16400
		U*M1-209	2840	20900
		U*M2-270	7000	27000
		U*M2-329	6840	32900
		U*M2-390	6640	39000
		U*M2-441	6480	44100
		U*M3-583	9960	58300
		U*M3-662	9720	66200
		U*M4-780	13280	78000
		U*M4-882	12960	88200
		U*M4-1100	21700	110000
		U*M4-1320	21200	132000
		U*M4-1656	20400	165600
U*M5-2065	25500	206500		
U*M6-2480	30600	248000		

R E M O O L E R	8 F P I	MODEL NUMBER	CFM	CAPACITY BTUH@10°TD +25°F
		UAH1-182	2800	18200
		UAH1-232	2720	23200
		UAH2-300	6880	30000
		UAH2-365	6600	36500
		UAH2-433	6400	43300
		UAH2-490	6250	49000
		UAH3-530	9800	53000
		UAH3-648	9600	64800
		UAH3-736	9400	73600
		UAH4-866	12800	86600
		UAH4-980	12500	98000
		UAH4-1100	12200	110000
		UAH4-1452	20700	145200
UAH4-1821	19900	182100		
UAH5-2275	24900	227500		
UAH6-2730	29900	273000		

# Physical Data

	MODEL NUMBER	FAN DIA. (In.)	MOTOR DATA (1)			OPTIONAL HEAT EXCH. (UNMTD.)	RE-EVAP HEAT EXCH. (UNMTD.)	CONNECTIONS (In.) (2)				SHIP WT. (LBS)
			QTY	HP	RPM			LIQUID	SUCTION ODS	H.G. ODS	DRAIN MPT	
FREEZER 4 FPI	U*U1-118	20	1	3/4	1625	HX-150	HEA2A	1/2FL	1-1/8	7/8	3/4	190
	U*U2-236	20	2	3/4	1625	HX-250	HEA3A	7/8 ODS	1-3/8	7/8	3/4	370
	U*U2-355	24	2	3/4	1075	HX-350	HEA4A	7/8 ODS	1-5/8	7/8	3/4	440
	U*U3-474	24	3	3/4	1075	HX-350	HEA5A	7/8 ODS	1-5/8	7/8	3/4	570
	U*U4-711	24	4	3/4	1075	HX-500	HEA6A	7/8 ODS	2-1/8	1-1/8	1-1/4	665
	U*U4-851	24	4	3/4	1075	(2) HX-500	(2) HEA5A	(2) 7/8 ODS	(2) 2-1/8	1-1/8	1-1/4	875
	U*U4-1080	24	4	3/4	1075	(2) HX-500	(2) HEA5A	(2) 7/8 ODS	(2) 2-1/8	1-1/8	1-1/4	900
U*U5-1350	24	5	3/4	1075	(2) HX-500	N/A	(2) 7/8 ODS	(2) 2-1/8	1-1/8	1-1/4	1125	
U*U6-1620	24	6	3/4	1075	(2) HX-500	N/A	(2) 1-1/8 ODS	(2) 2-5/8	1-1/8	1-1/4	1350	
FREEZER 6 FPI	U*L1-125	20	1	3/4	1625	HX-150	HEA3A	1/2FL	1-1/8	7/8	3/4	180
	U*L1-152	20	1	3/4	1625	HX-150	HEA3A	1/2FL	1-1/8	7/8	3/4	200
	U*L1-193	20	1	3/4	1625	HX-150	HEA3A	5/8 ODS	1-1/8	7/8	3/4	220
	U*L2-240	20	2	3/4	1625	HX-250	HEA4A	7/8 ODS	1-3/8	7/8	3/4	370
	U*L2-304	20	2	3/4	1625	HX-250	HEA4A	7/8 ODS	1-3/8	7/8	3/4	400
	U*L2-361	24	2	3/4	1075	HX-350	HEA4A	7/8 ODS	1-5/8	7/8	3/4	425
	U*L2-408	24	2	3/4	1075	HX-350	HEA5A	7/8 ODS	1-5/8	7/8	3/4	446
	U*L3-445	24	3	3/4	1075	HX-500	HEA5A	7/8 ODS	2-1/8	7/8	3/4	525
	U*L3-540	24	3	3/4	1075	HX-500	HEA5A	7/8 ODS	2-1/8	7/8	3/4	585
	U*L3-613	24	3	3/4	1075	HX-500	HEA6A	7/8 ODS	2-1/8	7/8	3/4	620
	U*L3-660	24	3	3/4	1075	HX-500	HEA6A	7/8 ODS	2-1/8	7/8	3/4	645
	U*L4-722	24	4	3/4	1075	HX-500	HEA6A	1-3/8 ODS	2-1/8	1-1/8	1-1/4	675
	U*L4-817	24	4	3/4	1075	HX-500	(2) HEA5A	7/8 ODS	2-1/8	1-1/8	1-1/4	726
	U*L4-950	24	4	3/4	1075	HX-500	(2) HEA5A	(2) 7/8 ODS	(2) 2-1/8	1-1/8	1-1/4	850
	U*L4-1100	24	4	3/4	1075	(2) HX-500	(2) HEA5A	(2) 7/8 ODS	(2) 2-1/8	1-1/8	1-1/4	885
U*L4-1260	24	4	3/4	1075	(2) HX-500	(2) HEA6A	(2) 7/8 ODS	(2) 2-1/8	1-1/8	1-1/4	895	
U*L4-1380	24	4	3/4	1075	(2) HX-500	(2) HEA6A	(2) 7/8 ODS	(2) 2-1/8	1-1/8	1-1/4	910	
U*L5-1575	24	5	3/4	1075	(2) HX-500	N/A	(2) 1-1/8 ODS	(2) 2-1/8	1-1/8	1-1/4	1120	
U*L5-1725	24	5	3/4	1075	(2) HX-500	N/A	(2) 1-1/8 ODS	(2) 2-1/8	1-1/8	1-1/4	1140	
U*L6-1890	24	6	3/4	1075	(2) HX-500	N/A	(2) 1-3/8 ODS	(2) 2-5/8	1-1/8	1-1/4	1345	
U*L6-2070	24	6	3/4	1075	(2) HX-500	N/A	(2) 1-3/8 ODS	(2) 2-5/8	1-1/8	1-1/4	1365	
COOLERS 6 FPI	U*M1-164	20	1	1/3	1075	HX-150	HEA3A	1/2FL	7/8	7/8	3/4	200
	U*M1-209	20	1	1/3	1075	HX-150	HEA3A	5/8 ODS	7/8	7/8	3/4	220
	U*M2-270	20	2	1/3	1075	HX-250	HEA4A	5/8 ODS	1-1/8	7/8	3/4	360
	U*M2-329	20	2	1/3	1075	HX-250	HEA4A	5/8 ODS	1-1/8	7/8	3/4	400
	U*M2-390	24	2	1/3	1075	HX-250	HEA4A	5/8 ODS	1-1/8	7/8	3/4	425
	U*M2-441	24	2	1/3	1075	HX-250	HEA5A	5/8 ODS	1-1/8	7/8	3/4	446
	U*M3-583	24	3	1/3	1075	HX-350	HEA5A	5/8 ODS	1-3/8	7/8	3/4	585
	U*M3-662	24	3	1/3	1075	HX-350	HEA6A	7/8 ODS	1-3/8	7/8	3/4	620
	U*M4-780	24	4	1/3	1075	HX-350	HEA6A	7/8 ODS	1-3/8	1-1/8	1-1/4	675
	U*M4-882	24	4	1/3	1075	HX-500	(2) HEA5A	7/8 ODS	1-3/8	1-1/8	1-1/4	726
	U*M4-1100	24	4	3/4	1075	(2) HX-350	(2) HEA5A	7/8 ODS	1-5/8	1-1/8	1-1/4	830
	U*M4-1320	24	4	3/4	1075	(2) HX-350	(2) HEA5A	1-1/8 ODS	1-5/8	1-1/8	1-1/4	885
U*M4-1656	24	4	3/4	1075	(2) HX-500	(2) HEA6A	1-1/8 ODS	2-1/8	1-1/8	1-1/4	910	
U*M5-2065	24	5	3/4	1075	(2) HX-500	N/A	1-5/8 ODS	2-5/8	1-1/8	1-1/4	1140	
U*M6-2480	24	6	3/4	1075	(2) HX-500	N/A	1-5/8 ODS	2-5/8	1-1/8	1-1/4	1365	
COOLERS 8 FPI	UAH1-182	20	1	1/3	1075	HX-150	N/A	5/8 ODS	7/8	N/A	3/4	210
	UAH1-232	20	1	1/3	1075	HX-150	N/A	5/8 ODS	7/8	N/A	3/4	230
	UAH2-300	20	2	1/3	1075	HX-250	N/A	5/8 ODS	1-1/8	N/A	3/4	370
	UAH2-365	20	2	1/3	1075	HX-250	N/A	5/8 ODS	1-1/8	N/A	3/4	410
	UAH2-433	24	2	1/3	1075	HX-250	N/A	5/8 ODS	1-1/8	N/A	3/4	435
	UAH2-490	24	2	1/3	1075	HX-250	N/A	5/8 ODS	1-1/8	N/A	3/4	458
	UAH3-530	24	3	1/3	1075	HX-250	N/A	7/8 ODS	1-3/8	N/A	3/4	550
	UAH3-648	24	3	1/3	1075	HX-350	N/A	7/8 ODS	1-3/8	N/A	3/4	600
	UAH3-736	24	3	1/3	1075	HX-350	N/A	7/8 ODS	1-3/8	N/A	3/4	635
	UAH4-866	24	4	1/3	1075	HX-350	N/A	7/8 ODS	1-3/8	N/A	1-1/4	690
	UAH4-980	24	4	1/3	1075	HX-500	N/A	7/8 ODS	1-3/8	N/A	1-1/4	746
	UAH4-1100	24	4	1/3	1075	(2) HX-350	N/A	7/8 ODS	1-3/8	N/A	1-1/4	785
	UAH4-1452	24	4	3/4	1075	(2) HX-350	N/A	7/8 ODS	1-5/8	N/A	1-1/4	905
	UAH4-1821	24	4	3/4	1075	(2) HX-500	N/A	7/8 ODS	2-1/8	N/A	1-1/4	930
UAH5-2275	24	5	3/4	1075	(2) HX-500	N/A	1-5/8 ODS	2-5/8	N/A	1-1/4	1165	
UAH6-2730	24	6	3/4	1075	(2) HX-500	N/A	1-5/8 ODS	2-5/8	N/A	1-1/4	1395	

(1) All motors are single phase. All three fan models and larger are delta wired for three phase power. Inherent three phase motors are available, contact factory.

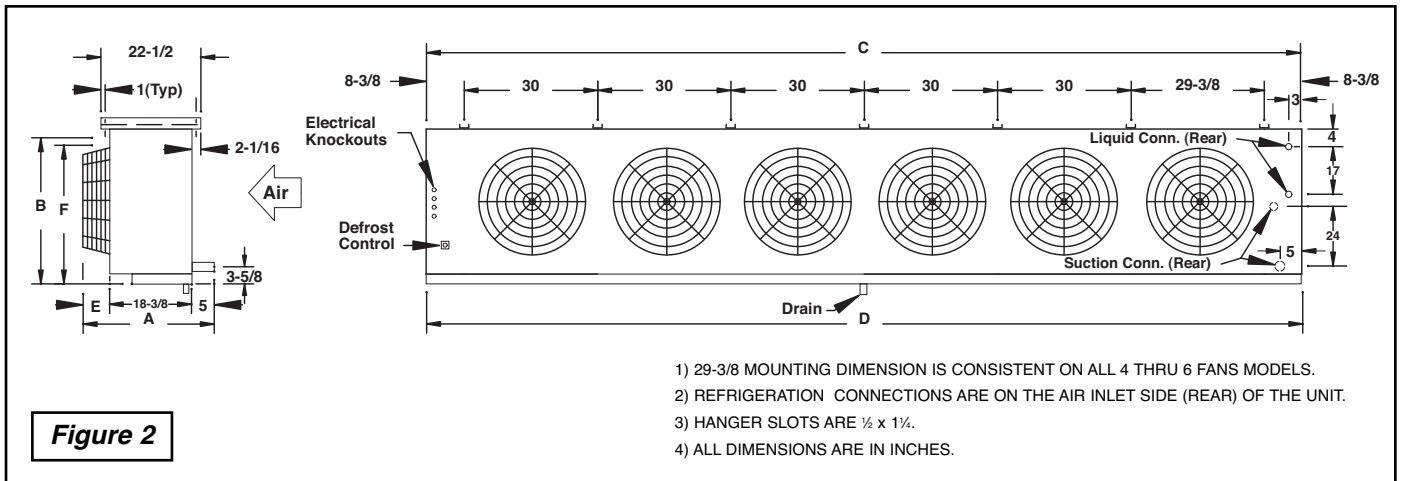
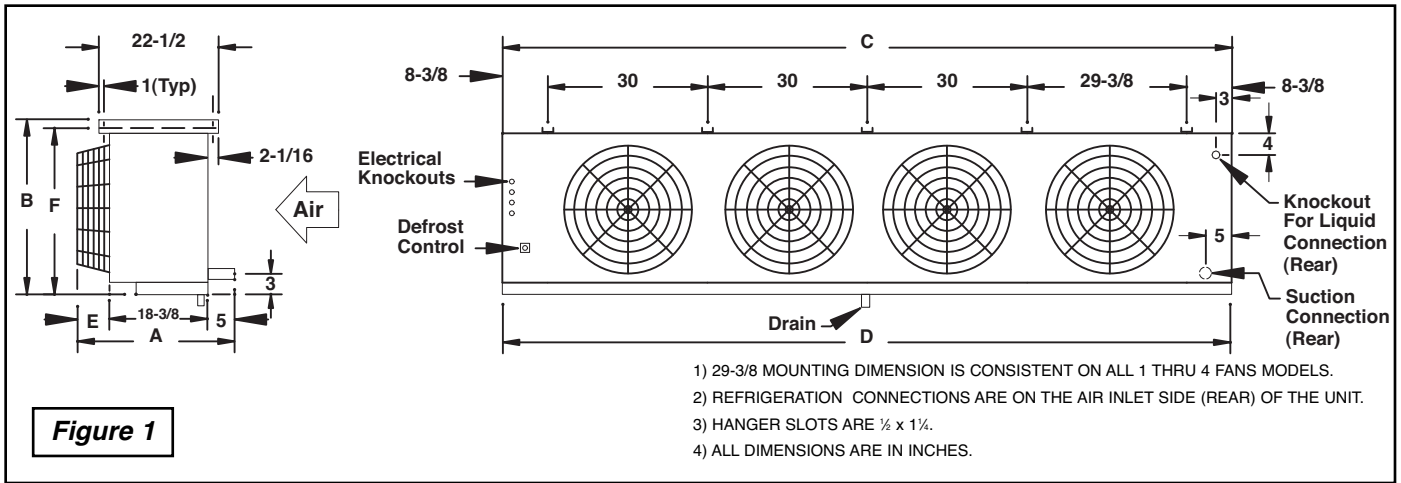
(2) All Ultra-Temps are custom circuited for optimum performance and operating efficiency. Should conditions vary from those listed to the right, \*connection sizes and quantity may be subject to change, contact factory to confirm.

\* Connection sizes are based on the following criteria:

- U\*U: -30° ST, 10°TD R-404A
- U\*L: -20° ST, 10°TD R-404A
- U\*M: +20° ST, 10°TD R-22
- UAH: +25° ST, 10°TD R-22

## Dimensions - Air & Electric Defrost Models

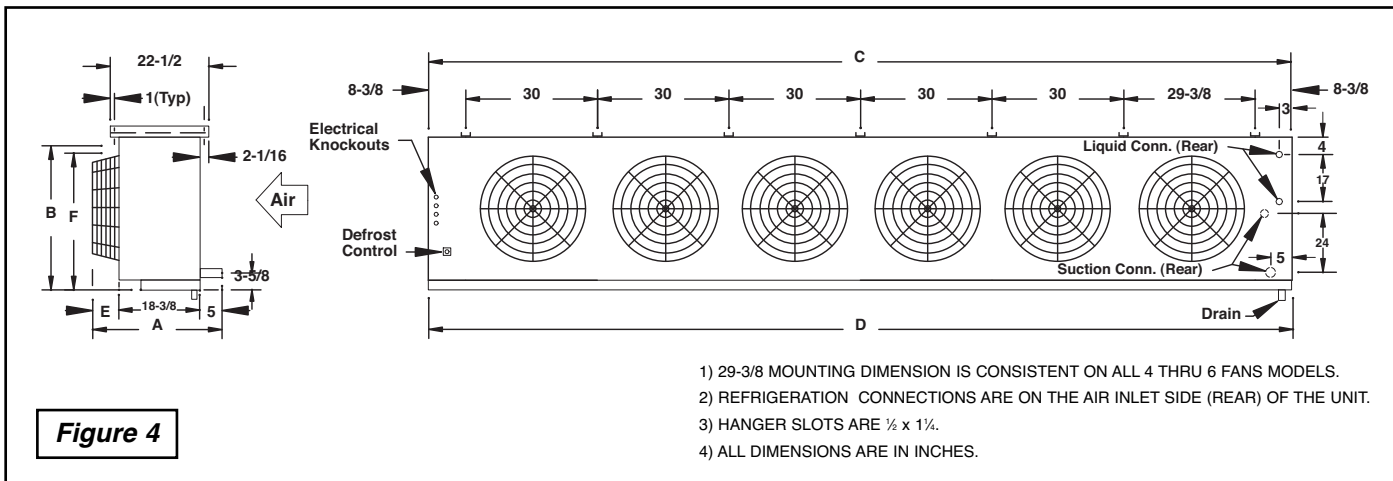
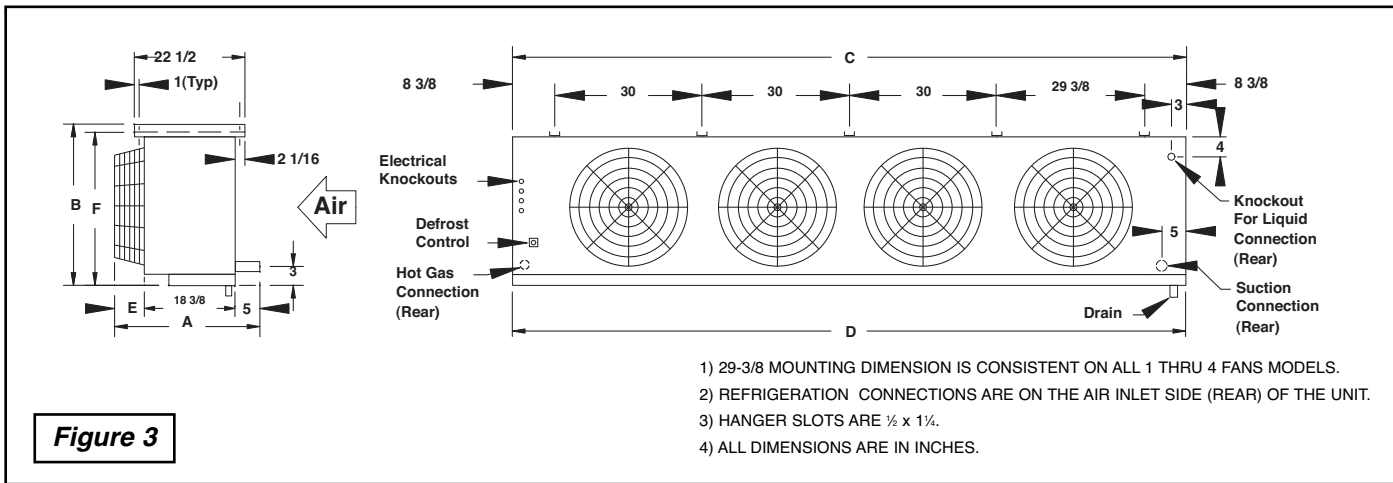
AIR & ELECTRIC DEFROST MODELS				QTY OF HANGERS	FIG.	DIMENSIONS (In.)				
						A	B	C	D	E
U*L1-125 U*L1-152 U*L1-193	U*U1-118	U*M1-164 U*M1-209	UAH1-182 UAH1-232	2	1	27-3/8	25-3/4	46-1/8	46-1/2	4
U*L2-240 U*L2-304	U*U2-236	U*M2-270 U*M2-329	UAH2-300 UAH2-365	3	1	27-3/8	26	76-1/8	76-1/2	4
U*L2-361 U*L2-408	U*U2-355	U*M2-390 U*M2-441	UAH2-433 UAH2-490	3	1	29-1/8	31-3/4	76-1/8	76-1/2	5-3/4
U*L3-445 U*L3-540 U*L3-613 U*L3-660	U*U3-474	U*M3-583 U*M3-662	UAH3-530 UAH3-648 UAH3-736	4	1	29-1/8	32	106-1/8	106-1/2	5-3/4
U*L4-722 U*L4-817	U*U4-711	U*M4-780 U*M4-882	UAH4-866 UAH4-980 UAH4-1100	5	1	29-1/8	32-1/4	136-1/8	136-1/2	5-3/4
U*L4-950 U*L4-1100 U*L4-1260 U*L4-1380	U*U4-851 U*U4-1080	U*M4-1100 U*M4-1320 U*M4-1656	UAH4-1452 UAH4-1821	5	2	29-1/8	50-1/4	136-1/8	136-1/2	5-3/4
U*L5-1575 U*L5-1725	U*U5-1350	U*M5-2065	UAH5-2275	6	2	29-1/8	50-1/2	166-1/8	166-1/2	5-3/4
U*L6-1890 U*L6-2070	U*U6-1620	U*M6-2480	UAH6-2730	7	2	29-1/8	50-3/4	196-1/8	196-1/2	5-3/4





## Dimensions - Hot Gas Defrost Models

HOT GAS DEFOST MODELS (Re-Evap & Reverse cycle)			QTY OF HANGERS	FIG.	DIMENSIONS (In.)					
					A	B	C	D	E	F
U*L1-125 U*L1-152 U*L1-193	U*U1-118	U*M1-164 U*M1-209	2	3	27-3/8	26-7/8	46-1/8	46-1/2	4	26-1/8
U*L2-240 U*L2-304	U*U2-236	U*M2-270 U*M2-329	3	3	27-3/8	27-3/8	76-1/8	76-1/2	4	26-1/8
U*L2-361 U*L2-408	U*U2-355	U*M2-390 U*M2-441	3	3	29-1/8	33-3/8	76-1/8	76-1/2	5-3/4	32-1/8
U*L3-445 U*L3-540 U*L3-613 U*L3-660	U*U3-474	U*M3-583 U*M3-662	4	3	29-1/8	33-7/8	106-1/8	106-1/2	5-3/4	32-1/8
U*L4-722 U*L4-817	U*U4-711	U*M4-780 U*M4-882	5	3	29-1/8	34-1/4	136-1/8	136-1/2	5-3/4	32-1/8
U*L4-950 U*L4-1100 U*L4-1260 U*L4-1380	U*U4-851 U*U4-1080	U*M4-1100 U*M4-1320 U*M4-1656	5	4	29-1/8	52-1/4	136-1/8	136-1/2	5-3/4	50-1/8
U*L5-1575 U*L5-1725	U*U5-1350	U*M5-2065	6	4	29-1/8	52-3/4	166-1/8	166-1/2	5-3/4	50-1/8
U*L6-1890 U*L6-2070	U*U6-1620	U*M6-2480	7	4	29-1/8	53-1/4	196-1/8	196-1/2	5-3/4	50-1/8





## Suction Line Heat Exchangers

MODEL NUMBER	CAPACITY - BTUH (R-22, R-404A)				DIMENSIONS (In)		CONNECTIONS (ODS) (In)		WT. (lbs)
	SUCTION TEMPERATURE (°F)				A	B	LIQUID	SUCTION	
	-40°F	-20°F	+10°F	+25°F					
HX - 25	2.6	3.4	6.0	6.8	11-1/2	1-3/4	1/4	1/2	2.0
HX - 50	4.5	6.0	11.9	13.6	12-3/4	2-3/8	3/8	5/8	2.0
HX - 75	7.0	9.4	17.8	21.3	13-5/8	2-5/8	3/8	7/8	2.0
HX - 100	9.6	12.8	24.7	28.1	14-1/8	2-7/8	3/8	1-1/8	3.0
HX - 150	14.0	18.7	36.6	42.5	14-1/8	3	1/2	1-1/8	3.0
HX - 250	23.0	30.6	59.5	69.7	14-1/4	3-5/8	5/8	1-3/8	4.0
HX - 350	34.4	45.9	90.1	102.0	16-1/4	3-5/8	5/8	1-5/8	6.0
HX - 500	47.2	62.9	120.7	141.1	17-1/4	4-5/8	7/8	2-1/8	7.0
LHX - 15	70.1	93.5	182.3	204.0	29-1/2	6-7/8	7/8	2-1/8	12.0
LHX - 20	92.4	123.3	238.0	272.0	29-1/2	6-7/8	1-1/8	2-1/8	15.0
LHX - 25	108.4	144.5	289.0	348.5	38	7-1/2	1-1/8	2-5/8	18.0
LHX - 30	140.3	187.0	348.5	399.5	38	8	1-3/8	2-5/8	20.0

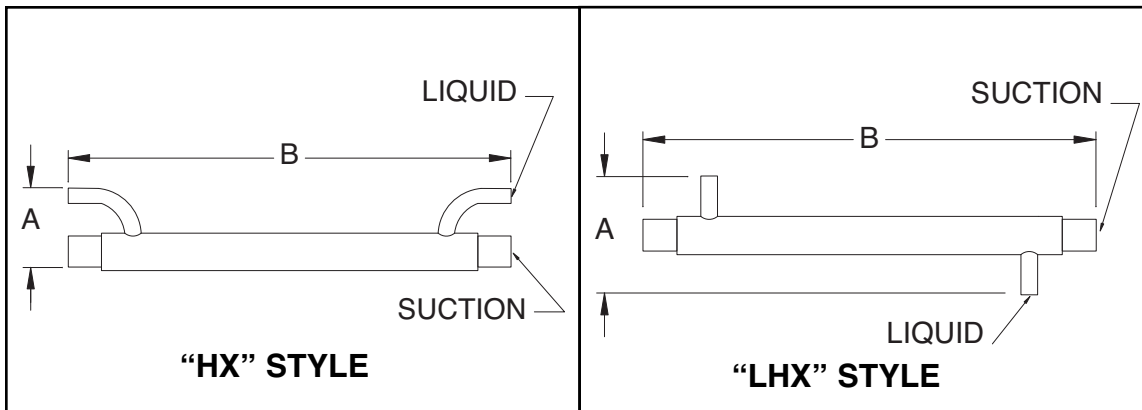


Figure 5

## Suction Line Heat Exchangers - Accumulator

MODEL NUMBER	CAPACITY BTUH	DIMENSIONS (In)		CONNECTIONS (In.)				WT. (lbs)
		A	B	LIQUID (ODS)		SUCTION (ODS)		
				INLET	OUTLET	INLET	OUTLET	
HEA-1A	6,000	9-3/4	5	3/8	3/8	7/8	7/8	10
HEA-2A	12,000	15-3/4	5	1/2	1/2	1-1/8	1-1/8	15
HEA-3A	24,000	27-3/4	5	1/2	1/2	1-3/8	1-3/8	20
HEA-4A	36,000	37-3/4	5	5/8	5/8	1-5/8	1-5/8	25
HEA-5A	55,000	45-3/8	6	5/8	5/8	2-1/8	2-1/8	40
HEA-6A	80,000	64-3/8	6	7/8	7/8	2-5/8	2-5/8	50

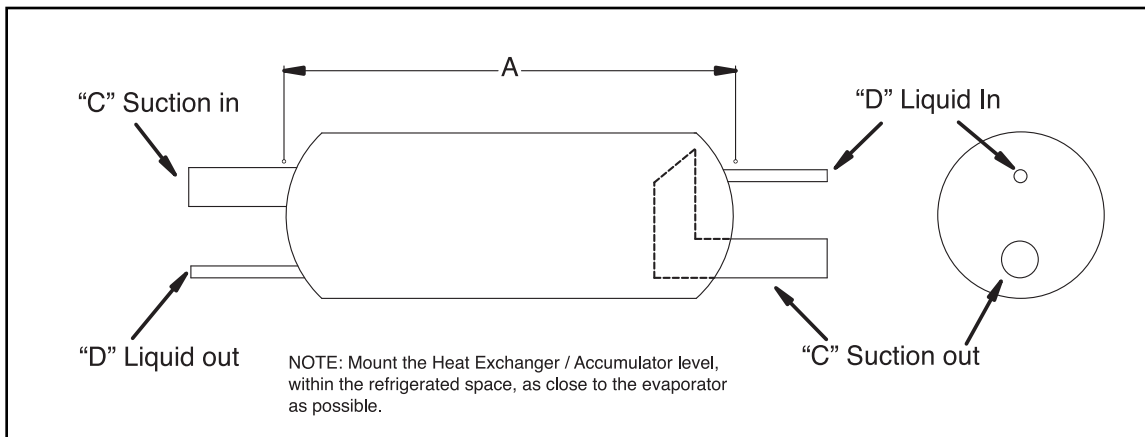


Figure 6

## Electrical Data

FREEZER	MODEL NUMBER	PERMANENTLY SPLIT CAPACITOR MOTORS (PSC)						ELECTRICALLY COMMUTATED MOTORS (ECM)						
		TOTAL MOTOR AMPS (3) - 60 Hz						TOTAL MOTOR WATTS	TOTAL MOTOR AMPS (3) - 60 Hz					
		115 V.		208-230 V.		460 V.			115 V.		208-230 V.		460 V.	
		1 PH	3 PH	1 PH	3 PH	1 PH	3 PH		1 PH	3 PH	1 PH	3 PH	1 PH	3 PH
U*U1-118	----	4.4	----	2.0	----	717	----	4.6	----	----	----	580		
U*U2-236	----	8.8	----	4.0	----	1434	----	9.2	----	----	----	1160		
U*U2-355	----	8.8	----	4.2	----	1700	----	10.4	----	----	----	990		
U*U3-474	----	13.2	7.6	----	3.6	2550	----	15.6	9.0	----	----	1485		
U*U4-711	----	17.6	11.6	----	5.6	3400	----	20.8	13.8	----	----	1980		
U*U4-851	----	17.6	11.6	----	5.6	3400	----	20.8	13.8	----	----	1980		
U*U4-1080	----	17.6	11.6	----	5.6	3400	----	20.8	13.8	----	----	1980		
U*U5-1350	----	22.0	15.2	----	7.3	4250	----	26.0	15.0	----	----	2475		
U*U6-1620	----	26.4	15.2	----	7.3	5100	----	31.2	18.0	----	----	2970		

FREEZER	U*L1-125	----	4.4	----	2.0	----	717	----	4.6	----	----	580
	U*L1-152	----	4.4	----	2.0	----	717	----	4.6	----	----	580
	U*L1-193	----	4.4	----	2.0	----	717	----	4.6	----	----	580
	U*L2-240	----	8.8	----	4.0	----	1434	----	9.2	----	----	1160
	U*L2-304	----	8.8	----	4.0	----	1434	----	9.2	----	----	1160
	U*L2-361	----	8.8	----	4.2	----	1700	----	10.4	----	----	990
	U*L2-408	----	8.8	----	4.2	----	1700	----	10.4	----	----	990
	U*L3-445	----	13.2	7.6	----	3.6	2550	----	15.6	9.0	----	1485
	U*L3-540	----	13.2	7.6	----	3.6	2550	----	15.6	9.0	----	1485
	U*L3-613	----	13.2	7.6	----	3.6	2550	----	15.6	9.0	----	1485
	U*L3-660	----	13.2	7.6	----	3.6	2550	----	15.6	9.0	----	1485
	U*L4-722	----	17.6	11.6	----	5.6	3400	----	20.8	13.8	----	1980
	U*L4-817	----	17.6	11.6	----	5.6	3400	----	20.8	13.8	----	1980
	U*L4-950	----	17.6	11.6	----	5.6	3400	----	20.8	13.8	----	1980
	U*L4-1100	----	17.6	11.6	----	5.6	3400	----	20.8	13.8	----	1980
	U*L4-1260	----	17.6	11.6	----	5.6	3400	----	20.8	13.8	----	1980
U*L4-1380	----	17.6	11.6	----	5.6	3400	----	20.8	13.8	----	1980	
U*L5-1575	----	22.0	15.2	----	7.3	4250	----	26.0	15.0	----	2475	
U*L5-1725	----	22.0	15.2	----	7.3	4250	----	26.0	15.0	----	2475	
U*L6-1890	----	25.2	15.2	----	7.3	5100	----	31.2	18.0	----	2970	
U*L6-2070	----	26.4	15.2	----	7.3	5100	----	31.2	18.0	----	2970	

COOLER	U*M1-164	7.1	3.1	----	1.3	----	357	3.0	2.1	----	----	225
	U*M1-209	7.1	3.1	----	1.3	----	357	3.0	2.1	----	----	225
	U*M2-270	14.2	6.2	----	2.6	----	714	6.0	4.2	----	----	450
	U*M2-329	14.2	6.2	----	2.6	----	714	6.0	4.2	----	----	450
	U*M2-390	14.2	6.2	----	2.6	----	714	6.0	4.2	----	----	450
	U*M2-441	14.2	6.2	----	2.6	----	714	6.0	4.2	----	----	450
	U*M3-583	21.3	9.3	5.4	3.9	2.3	1071	9.0	6.3	3.6	----	675
	U*M3-662	21.3	9.3	5.4	3.9	2.3	1071	9.0	6.3	3.6	----	675
	U*M4-780	28.4	12.4	8.2	5.2	3.4	1428	12.0	8.4	5.6	----	900
	U*M4-882	28.4	12.4	8.2	5.2	3.4	1428	12.0	8.4	5.6	----	900
	U*M4-1100	----	17.2	11.4	10.0	6.6	3400	----	20.8	13.8	----	1980
	U*M4-1320	----	17.2	11.4	10.0	6.6	3400	----	20.8	13.8	----	1980
	U*M4-1656	----	17.2	11.4	10.0	6.6	3400	----	20.8	13.8	----	1980
	U*M5-2065	----	21.5	14.9	12.5	8.7	4250	----	26.0	15.0	----	2475
U*M6-2480	----	25.8	14.9	15.0	8.7	5100	----	31.2	18.0	----	2970	

COOLER	UAH1-182	7.1	3.1	----	1.3	----	357	3.0	2.1	----	----	225
	UAH1-232	7.1	3.1	----	1.3	----	357	3.0	2.1	----	----	225
	UAH2-300	14.2	6.2	----	2.6	----	714	6.0	4.2	----	----	450
	UAH2-365	14.2	6.2	----	2.6	----	714	6.0	4.2	----	----	450
	UAH2-433	14.2	6.2	----	2.6	----	714	6.0	4.2	----	----	450
	UAH2-490	14.2	6.2	----	2.6	----	714	6.0	4.2	----	----	450
	UAH3-530	21.3	9.3	5.4	3.9	2.3	1071	18.0	6.3	3.6	----	675
	UAH3-648	21.3	9.3	5.4	3.9	2.3	1071	18.0	6.3	3.6	----	675
	UAH3-736	21.3	9.3	5.4	3.9	2.3	1071	18.0	6.3	3.6	----	675
	UAH4-866	28.4	12.4	8.2	5.2	3.4	1428	21.0	8.4	5.6	----	900
	UAH4-980	28.4	12.4	8.2	5.2	3.4	1428	21.0	8.4	5.6	----	900
	UAH4-1100	28.4	12.4	8.2	5.2	3.4	1428	21.0	8.4	5.6	----	900
	UAH4-1452	----	17.2	11.4	10.0	6.6	3400	----	20.8	13.8	----	1980
	UAH4-1821	----	17.2	11.4	10.0	6.6	3400	----	20.8	13.8	----	1980
	UAH5-2275	----	21.5	14.9	12.5	8.7	4250	----	26.0	15.0	----	2475
	UAH6-2730	----	25.8	14.9	15.0	8.7	5100	----	31.2	18.0	----	2970

(3) All models have single phase motors. Three fan models and larger are delta wired for three phase supply power.

## Electrical Data

F R E E Z E R	4 F P I	MODEL NUMBER	ELECTRIC DEFROST (4)						WATTS
			AMPERAGE RATINGS @ 60 Hz						
			208 V.		230 V.		460 V.		
			1 PH	3 PH	1 PH	3 PH	1 PH	3 PH	
		U*U1-118	19.9	13.2	22.0	14.6	11.0	9.5	5,512
		U*U2-236	35.5	23.5	39.3	26.0	19.6	17.0	9,832
		U*U2-355	35.5	23.5	39.3	26.0	19.6	17.0	9,832
		U*U3-474	-----	33.8	-----	37.4	28.5	24.5	14,152
		U*U4-711	-----	43.3	-----	47.8	-----	26.0	18,440
		U*U4-851	-----	61.0	-----	67.5	-----	33.8	27,660
		U*U4-1080	-----	61.0	-----	67.5	-----	33.8	27,660
		U*U5-1350	-----	75.2	-----	83.9	-----	41.6	34,575
		U*U6-1620	-----	89.3	-----	98.7	-----	49.3	41,490

F R E E Z E R	6 F P I	U*L1-125	19.9	13.2	22.0	14.6	11.0	9.5	5,512
		U*L1-152	19.9	13.2	22.0	14.6	11.0	9.5	5,512
		U*L1-193	19.9	13.2	22.0	14.6	11.0	9.5	5,512
		U*L2-240	35.5	23.5	39.3	26.0	19.6	17.0	9,832
		U*L2-304	35.5	23.5	39.3	26.0	19.6	17.0	9,832
		U*L2-361	35.5	23.5	39.3	26.0	19.6	17.0	9,832
		U*L2-408	35.5	23.5	39.3	26.0	19.6	17.0	9,832
		U*L3-445	-----	33.8	-----	37.4	28.2	24.5	14,152
		U*L3-540	-----	33.8	-----	37.4	28.2	24.5	14,152
		U*L3-613	-----	33.8	-----	37.4	28.2	24.5	14,152
		U*L3-660	-----	33.8	-----	37.4	28.2	24.5	14,152
		U*L4-722	-----	43.2	-----	47.8	-----	26.0	18,440
		U*L4-817	-----	43.2	-----	47.8	-----	26.0	18,440
		U*L4-950	-----	61.0	-----	67.5	-----	33.8	27,660
		U*L4-1100	-----	61.0	-----	67.5	-----	33.8	27,660
		U*L4-1260	-----	61.0	-----	67.5	-----	33.8	27,660
		U*L4-1380	-----	61.0	-----	67.5	-----	33.8	27,660
		U*L5-1575	-----	75.2	-----	83.9	-----	41.6	34,575
U*L5-1725	-----	75.2	-----	83.9	-----	41.6	34,575		
U*L6-1890	-----	89.3	-----	98.1	-----	49.3	41,490		
U*L6-2070	-----	89.3	-----	98.1	-----	49.3	41,490		

C O O L E R	6 F P I	U*M1-164	19.9	13.2	22.0	14.6	11.0	9.5	5,512
		U*M1-209	19.9	13.2	22.0	14.6	11.0	9.5	5,512
		U*M2-270	35.5	23.5	39.3	26.0	19.6	17.0	9,832
		U*M2-329	35.5	23.5	39.3	26.0	19.6	17.0	9,832
		U*M2-390	35.5	23.5	39.3	26.0	19.6	17.0	9,832
		U*M2-441	35.5	23.5	39.3	26.0	19.6	17.0	9,832
		U*M3-583	-----	33.8	-----	37.4	-----	24.5	14,152
		U*M3-662	-----	33.8	-----	37.4	-----	24.5	14,152
		U*M4-780	-----	43.3	-----	47.8	-----	24.3	18,440
		U*M4-882	-----	43.3	-----	47.8	-----	24.3	18,440
		U*M4-1100	-----	64.3	-----	71.3	-----	33.7	27,660
		U*M4-1320	-----	64.3	-----	71.3	-----	33.7	27,660
		U*M4-1656	-----	64.3	-----	71.3	-----	33.7	27,660
		U*M5-2065	-----	72.2	-----	79.8	-----	39.9	34,575
		U*M6-2480	-----	86.6	-----	95.7	-----	47.9	41,490

(4) All electric defrost models are standard three phase heaters unless otherwise specified.  
See table above to determine models applicable to single phase heater applications.

## Electrical Defrost Kits

FREEZER	MODEL NUMBER	1 EVAPORATOR		2 EVAPORATORS		3 EVAPORATORS	
		230/3	460/3	230/3	460/3	230/3	460/3
4	U*U1-118	ED-11	ED-12	ED-21	ED-22	ED-33	ED-32
	U*U2-236	ED-11	ED-12	ED-25	ED-24	ED-35	ED-36
	U*U2-355	ED-11	ED-12	ED-25	ED-24	ED-35	ED-36
	U*U3-474	ED-14	ED-12	ED-26	ED-24	ED-38	ED-36
	U*U4-711	ED-14	ED-12	ED-26	ED-26	ED-38	ED-36
	U*U4-851	ED-16	ED-14	ED-28	ED-26	(1)	ED-38
	U*U4-1080	ED-16	ED-14	ED-28	ED-26	(1)	ED-38
	U*U5-1350	ED-16	ED-14	(1)	ED-26	(1)	ED-38
U*U6-1620	(1)	ED-16	(1)	ED-28	(1)	ED-38	
6	U*L1-125	ED-11	ED-12	ED-21	ED-22	ED-33	ED-32
	U*L1-152	ED-11	ED-12	ED-21	ED-22	ED-33	ED-32
	U*L1-193	ED-11	ED-12	ED-21	ED-22	ED-33	ED-32
	U*L2-240	ED-11	ED-12	ED-25	ED-24	ED-35	ED-36
	U*L2-304	ED-11	ED-12	ED-25	ED-24	ED-35	ED-36
	U*L2-361	ED-11	ED-12	ED-25	ED-24	ED-35	ED-36
	U*L2-408	ED-11	ED-12	ED-25	ED-24	ED-35	ED-36
	U*L3-445	ED-14	ED-12	ED-26	ED-24	ED-38	ED-36
	U*L3-540	ED-14	ED-12	ED-26	ED-24	ED-38	ED-36
	U*L3-613	ED-14	ED-12	ED-26	ED-24	ED-38	ED-36
	U*L3-660	ED-14	ED-12	ED-26	ED-24	ED-38	ED-36
	U*L4-722	ED-14	ED-12	ED-26	ED-24	ED-38	ED-36
	U*L4-817	ED-14	ED-12	ED-26	ED-24	ED-38	ED-36
	U*L4-950	ED-16	ED-14	ED-28	ED-26	(1)	ED-38
	U*L4-1100	ED-16	ED-14	ED-28	ED-26	(1)	ED-38
	U*L4-1260	ED-16	ED-14	ED-28	ED-26	(1)	ED-38
U*L4-1380	ED-16	ED-14	ED-28	ED-26	(1)	ED-38	
U*L5-1575	ED-16	ED-14	(1)	ED-26	(1)	ED-38	
U*L5-1725	ED-16	ED-14	(1)	ED-26	(1)	ED-38	
U*L6-1890	(1)	ED-16	(1)	ED-28	(1)	ED-38	
U*L6-2070	(1)	ED-16	(1)	ED-28	(1)	ED-38	
COOLER	U*M1-164	ED-11	ED-12	ED-21	ED-22	ED-33	ED-32
	U*M1-209	ED-11	ED-12	ED-21	ED-22	ED-33	ED-32
	U*M2-270	ED-11	ED-12	ED-25	ED-24	ED-35	ED-36
	U*M2-329	ED-11	ED-12	ED-25	ED-24	ED-35	ED-36
	U*M2-390	ED-11	ED-12	ED-25	ED-24	ED-35	ED-36
	U*M2-441	ED-11	ED-12	ED-25	ED-24	ED-35	ED-36
	U*M3-583	ED-14	ED-12	ED-26	ED-24	ED-38	ED-36
	U*M3-662	ED-14	ED-12	ED-26	ED-24	ED-38	ED-36
	U*M4-780	ED-14	ED-12	ED-28	ED-24	ED-38	ED-36
	U*M4-882	ED-14	ED-12	ED-28	ED-24	ED-38	ED-36
	U*M4-1100	ED-16	ED-14	ED-28	ED-26	(1)	ED-38
	U*M4-1320	ED-16	ED-14	ED-28	ED-26	(1)	ED-38
U*M4-1656	ED-16	ED-14	ED-28	ED-26	(1)	ED-38	
U*M5-2065	ED-16	ED-14	(1)	ED-26	(1)	ED-38	
U*M6-2480	(1)	ED-16	(1)	ED-28	(1)	ED-38	

(1) Consult factory.

## Electrical Defrost Kit Components

MODEL NUMBER	TIMER	AUXILIARY SWITCH	BLOCK-OUT RELAY	CONTACTORS		SEQUENCY RELAY
				DEFROST HEATERS	FAN	
ED-10	1	----	1-30A	----	----	----
ED-11	1	1	----	1-30A	----	----
ED-12	1	1	----	1-30A	1-25A	----
ED-13	1	1	----	1-50A	----	----
ED-14	1	1	----	1-50A	1-25A	----
ED-15	1	1	----	2-50A	----	----
ED-16	1	1	----	2-50A	1-25A	----
ED-20	1	----	1-30A	----	----	2
ED-21	1	1	----	2-15A	----	2
ED-22	1	1	----	2-15A	1-25A	2
ED-23	1	1	----	2-25A	----	2
ED-24	1	1	----	2-25A	1-25A	2
ED-25	1	1	----	2-50A	----	2
ED-26	1	1	----	2-50A	1-25A	2
ED-27	1	1	----	2-75A	----	2
ED-28	1	1	----	2-75A	1-25A	2
ED-30	1	----	1-30A	----	----	3
ED-32	1	1	----	3-10A	1-25A	3
ED-33	1	1	----	3-15A	----	3
ED-34	1	1	----	3-15A	1-25A	3
ED-35	1	1	----	3-30A	----	3
ED-36	1	1	----	3-30A	1-25A	3
ED-37	1	1	----	3-50A	----	3
ED-38	1	1	----	3-50A	1-40A	3

### TIMER

Initiates the defrost cycle. Also used as over ride protection for defrost termination.

### AUXILIARY SWITCH

Mounted on the compressor contactor, it prevents the defrost contactor from operating whenever the compressor is energized.

### BLOCK-OUT RELAY

Serves the same function as auxiliary switch, except used when defrost contactor is not required (single phase only).

### FAN CONTACTOR

Used with 460 V. motors or when 230 V. motors are wired for 3 phase power.

### DEFROST CONTACTOR

Carries amperage load for heaters. Contactor selection is based on the maximum resistive load rating of the contactor.

### SEQUENCING RELAYS

Provides interconnection of multiple unit coolers on a single system so that each unit cooler is allowed to individually terminate defrost on temperature.