COLMAC COIL
Manufacturing Inc.

P/N 40,053

UNIT COOLERS
INSTALLATION MANUAL

UNIT COOLERS

Installation, Operation & Maintenance Instructions

COVERS MODELS:

4HP1-118 thru 8HP4-990
4LP1-35 thru 8LP6-410
GF-54 thru GF-280

UL®

SPECIFY COLMAC QUALITY

GENERAL

INSPECTION

Upon receipt of equipment, inspect for shortages and damage.

Any shortage or damage found should be noted on delivery receipt; this action notifies carrier that you intend to file a claim. If any shortage or damage is discovered after unpacking the unit, call the delivering carrier for a concealed damage or shortage inspection. The inspector will need related paperwork, delivery receipt, and any information indicating his liability for the damage.

Also check electrical characteristics on spec. plate of unit to be certain that unit is compatible with power supply.

INSTALLATION

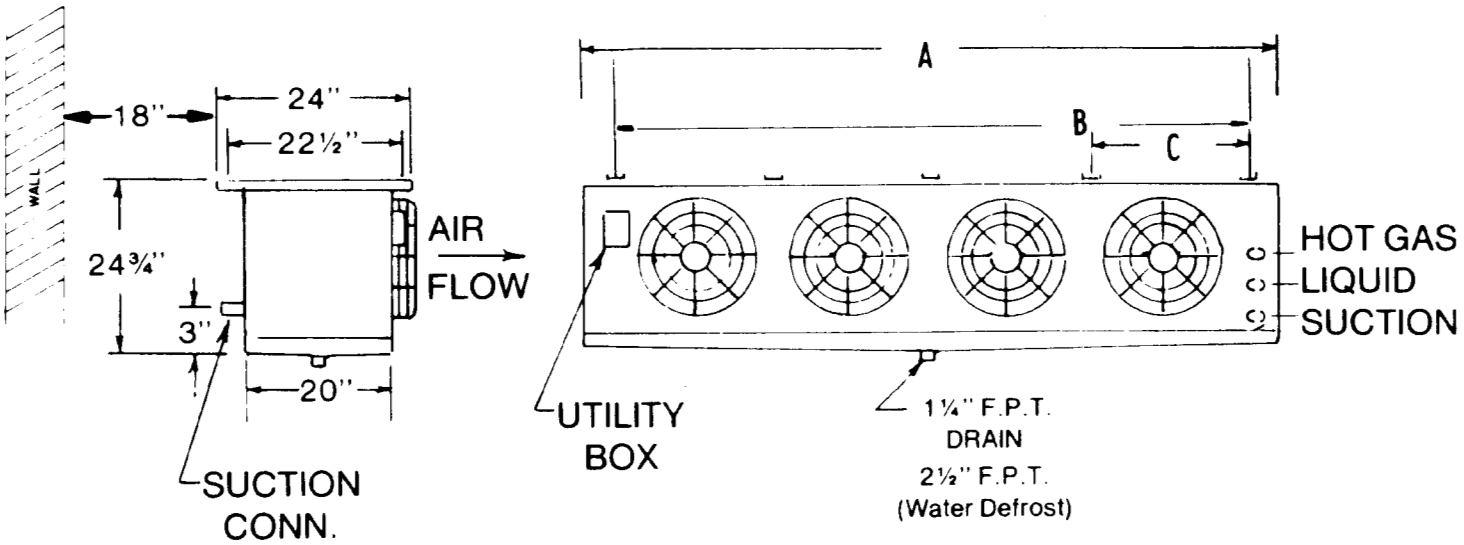
LOCATION

For best operation, the units should be located away from doors or placed in such a way that air from open doors can not be drawn directly into the evaporator coil. See figures 1 through 4 for dimensions and minimum clearances for good air flow. Side clearances for access into service compartments should be 24" minimum. Bottom clearance for removal of drain pan and electric defrost heaters should also be 24" minimum.

MOUNTING

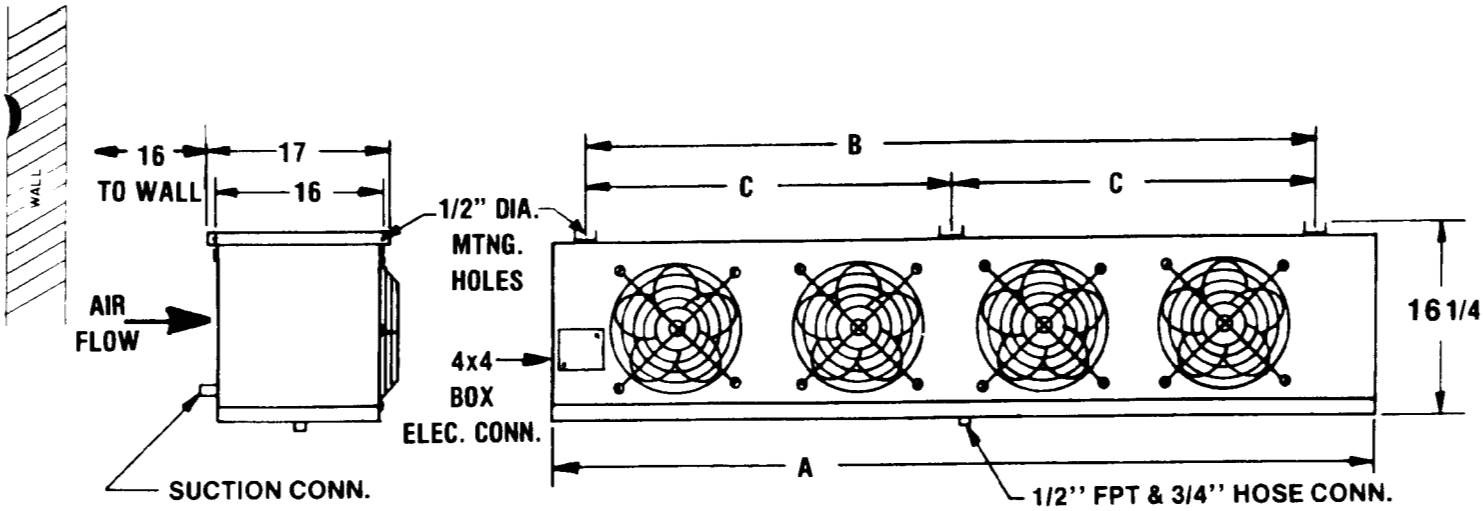
The unit must be mounted level for proper drainage. The bolts, lag screws, or hanger rod used should be at least 5/16 inch diameter.

Figure 1: HP Dimensions



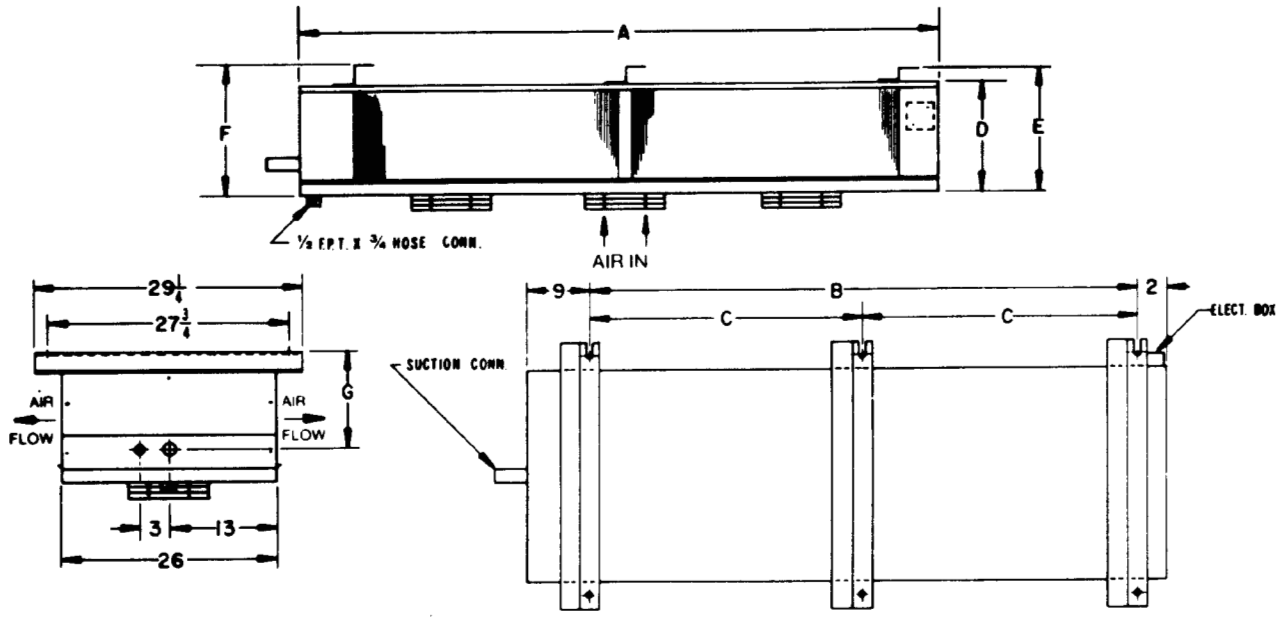
No. of Fans	No. of Hangers	A	B	C
1	2	40	30	30
2	3	69	59	29½
3	4	98	88	29½
4	5	127	117	29½

Figure 2: LP Dimensions



No. Fans	No. Hangers	A	B	C
1	2	25 3/4	17 1/4	---
2	2	42 1/4	33 3/4	---
3	2	59 1/2	50 3/4	---
4	3	75 1/4	66 3/4	33 3/8
5	5	92 1/4	83 1/4	41 7/8
6	3	108 1/4	99 3/4	49 7/8

Figure 4: GF Dimensions



Model	No. Fans	No. Hangers	A	B	C	D	E	F	G
GF-54	2	2	60	49	---	7 1/4	8 1/4	8 3/4	6 1/2
GF-72	2	2	60	49	---	7 1/4	8 1/4	8 3/4	6 1/2
GF-105	3	3	84	73	36 1/2	7 1/4	8 1/4	8 3/4	6 1/2
GF-134	3	3	84	73	36 1/2	8 3/4	9 3/4	10 1/4	7 3/8
GF-192	4	3	102	91	45 1/2	10 1/4	11 1/4	11 3/4	8 7/8
GF-280	4	3	102	91	45 1/2	13 1/4	14 1/4	14 3/4	11 7/8

PIPING

Install all refrigerant components in accordance with applicable local and national codes and in accordance with good practice for proper system operation. Connect the suction line to the connection extending through the unit cabinet and run the liquid line through the opening provided in the cabinet. See tables 1 through 4 for suction connection, liquid connection and unit weights. See tables 9 and 10 for line sizing information.

Suction lines should be sloped towards the compressor at the rate of one (1) inch per ten (10) feet for good oil return. Vertical risers of more than (5) feet should be trapped at the bottom with a P-trap or equivalent field fabricated trap.

EXPANSION VALVE

All units require the use of an external equalized expansion valve and are provided with a 1/4" Flare Nut installed at the factory.

It is important that the operation of the expansion valve be checked out after the system has balanced out at the desired room temperature as there are many factors which affect the peformance of an expansion valve. If the coil is being starved, it is necessary to reduce the superheat setting of the expansion valve. To obtain full evaporator performance and uniform frost loading, the expansion valve should be set at the proper superheat at the lowest evaporator temperature at which the system is expected to operate.

It is recommended that for a 10° to 12° T.D. system, the valve should be adjusted to maintain 5° to 6° superheat. Preservation of the perishable products will be greatly improved when the evaporator coils are supplied with adequate refrigerant for full performance.

Select the proper thermostatic expansion valve from manufacturer's literature. The valve can be mounted inside the unit end compartment. The expansion valve bulb must be located on a straight length of suction line as close as possible to the suction header.

DRAIN LINE PIPING

Each unit should be individually trapped unless all units are to be defrosted at the same time. Individual trapping prevents draw back of heated air from off of defrosting units. For multiple unit installations with simultaneous defrost a common trap will suffice and will permit the use of one timer.

The drain connection on High Profile unit coolers is shown in Figure 1. The drain line should be pitched sharply down (at least 1 inch per foot) and be as short as possible within the refrigerated space. A trap, common or individual, must be provided to each unit. Locating the trap in a warm area will eliminate the need for heat tapes to prevent freeze up.

It will be necessary to heat the drain line in the refrigerated space to prevent refreezing of the defrost water and plugging. An electrical heating cable or tape having an input of 15 watts per foot for 0°F (-18°C) Rooms and 30 watts per foot for-20°F (-39°C) Rooms is recommended. The drain line should be insulated along its entire length within the refrigerated space.

FIELD WIRING

All wiring must be done in accordance with applicable local and national codes.

Unit wiring diagrams are shown in Diagrams 1 through 5. Field wiring connections are made to the external junction box(s) provided. Make sure the unit is properly grounded. Tables 5 through 8 show electrical information for the motors and heaters.

Select fusing for the total defrost heater amps. The ampacity of supply conductors must be equal to the fuse size.

Select field wiring size and fusing for multiple units in the same manner as single units. When the defrost heater amperage load exceeds the contact rating of the timer, the heaters must be controlled by contactors.

Table 1: HP Physical Data

Model	Liquid Conn.	Suction OD Sweat	Net Weight	Model	Liquid Conn.	Suction OD Sweat	Net Weight
4HP1-118	1/2" Flare	1 1/8	140	6HP1-175	1/2" Flare	1 1/8	150
4HP1-148	"	1 1/8	160	6HP1-219	"	1 1/8	170
4HP2-236	"	1 3/8	275	6HP2-350	"	1 3/8	280
4HP2-295	"	1 3/8	310	6HP2-437	1 1/8" ODS	1 5/8	320
4HP3-353	7/8" ODS	2 1/8	465	6HP3-525	"	1 5/8	440
4HP3-440	1 1/8" ODS	2 1/8	480	6HP3-655	1 3/8" ODS	2 1/8	490
4HP4-472	"	2 1/8	553	6HP4-700	"	2 1/8	520
4HP4-590	"	2 1/8	620	6HP4-875	"	2 1/8	640
5HP1-147	1/2" Flare	1 1/8	145	8HP1-198	1/2" Flare	1 1/8	170
5HP1-184	"	1 1/8	165	8HP1-247	"	1 1/8	190
5HP2-294	"	1 3/8	277	8HP2-396	"	1 3/8	310
5HP2-367	7/8" ODS	1 5/8	315	8HP2-495	7/8" ODS	1 3/8	350
5HP3-440	1 1/8" ODS	1 5/8	430	8HP3-592	"	1 5/8	472
5HP3-550	"	2 1/8	485	8HP3-740	1 1/8" ODS	2 1/8	530
5HP4-590	"	2 1/8	558	8HP4-790	"	2 1/8	604
5HP4-735	1 3/8" ODS	2 1/8	630	8HP4-990	1 3/8" ODS	2 1/8	680

Table 2: LP Physical Data

Model	Liquid Conn. Flare	Suction ODS	Net Weight	Model	Liquid Conn. Flare	Suction ODS	Net Weight
4LP1-35	1/2" female	5/8	55	6LP1-47	1/2" female	5/8	60
4LP2-52	"	5/8	75	6LP2-70	"	5/8	80
4LP2-70	"	7/8	70	6LP2-95	"	7/8	75
4LP2-89	"	7/8	80	6LP2-122	"	7/8	85
4LP3-106	"	7/8	95	6LP3-144	"	7/8	100
4LP3-136	"	7/8	115	6LP3-184	"	1 1/8	120
4LP4-179	"	1 1/8	135	6LP4-243	"	1 1/8	145
4LP5-225	"	1 1/8	170	6LP5-305	"	1 3/8	175
4LP6-268	"	1 1/8	220	6LP6-363	5/8" female	1 3/8	240
5LP1-42	"	5/8	60	8LP1-53	1/2" female	5/8	65
5LP2-62	"	5/8	80	8LP2-79	"	5/8	85
5LP2-84	"	7/8	75	8LP2-107	"	7/8	80
5LP2-108	"	7/8	85	8LP2-137	"	7/8	90
5LP3-128	"	7/8	100	8LP3-162	"	1 1/8	110
5LP3-164	"	1 1/8	120	8LP3-208	"	1 1/8	120
5LP4-216	"	1 1/8	140	8LP4-274	"	1 3/8	150
5LP5-272	"	1 3/8	175	8LP5-345	"	1 3/8	175
5LP6-324	5/8" female	1 3/8	235	8LP6-410	5/8" female	1 3/8	240

Table 4: GF Physical Data

Model	Liquid Conn.	Suction O.D. Sweat	Net Weight
GF-54	1/2 SAE Flare	7/8	157
GF-72	1/2 SAE Flare	7/8	172
GF-105	1/2 SAE Flare	1 1/8	221
GF-134	1/2 SAE Flare	1 1/8	250
GF-192	1/2 SAE Flare	1 1/8	314
GF-280	1/2 SAE Flare	1 3/8	383

Table 5: HP Electrical Data

		Motor Data Full Load Amps								Electric Defrost Heater Including Drain Pan Heater Amps					
	No.	Standard 1/4 H.P.				Oversize 1/2 H.P.									
Model	Motors	115/1	230/1	230/3	460/3	115/1	230/1	230/3	460/3	Watts	208/1	230/1	208/3	230/3	460/3
4HP1-118	1	3.7	1.7	1.6	.8	8.0	4.0	2.2	1.1	3440	13.5	15.0	7.8	8.7	4.4
4HP1-148	1	3.7	1.7	1.6	.8	8.0	4.0	2.2	1.1	3440	13.5	15.0	7.8	8.7	4.4
4HP2-236	2	7.4	3.4	3.2	1.6	16.0	8.0	4.4	2.2	6890	27.0	30.0	15.6	17.3	8.7
4HP2-295	2	7.4	3.4	3.2	1.6	16.0	8.0	4.4	2.2	6890	27.0	30.0	15.6	17.3	8.7
4HP3-353	3	11.1	5.1	4.8	2.4	24.0	12.0	6.6	3.3	10330	40.5	45.0	23.4	25.9	13.0
4HP3-440	3	11.1	5.1	4.8	2.4	24.0	12.0	6.6	3.3	10330	40.5	45.0	23.4	25.9	13.0
4HP4-472	4	14.8	6.8	6.4	3.2	32.0	16.0	8.8	4.4	13800	54.3	60.0	31.4	34.6	17.3
4HP4-590	4	14.8	6.8	6.4	3.2	32.0	16.0	8.8	4.4	13800	54.3	60.0	31.4	34.6	17.3
5HP1-147	1	3.7	1.7	1.6	.8	8.0	4.0	2.2	1.1	3440	13.5	15.0	7.8	8.7	4.4
5HP1-184	1	3.7	1.7	1.6	.8	8.0	4.0	2.2	1.1	3440	13.5	15.0	7.8	8.7	4.4
5HP2-294	2	7.4	3.4	3.2	1.6	16.0	8.0	4.4	2.2	6890	27.0	30.0	15.6	17.3	8.7
5HP2-367	2	7.4	3.4	3.2	1.6	16.0	8.0	4.4	2.2	6890	27.0	30.0	15.6	17.3	8.7
5HP3-440	3	11.1	5.1	4.8	2.4	24.0	12.0	6.6	3.3	10330	40.5	45.0	23.4	25.9	13.0
5HP3-550	3	11.1	5.1	4.8	2.4	24.0	12.0	6.6	3.3	10330	40.5	45.0	23.4	25.9	13.0
5HP4-590	4	14.8	6.8	6.4	3.2	32.0	16.0	8.8	4.4	13800	54.3	60.0	31.4	34.6	17.3
5HP4-735	4	14.8	6.8	6.4	3.2	32.0	16.0	8.8	4.4	13800	54.3	60.0	31.4	34.6	17.3
6HP1-175	1	3.7	1.7	1.6	.8	8.0	4.0	2.2	1.1	3440	13.5	15.0	7.8	8.7	4.4
6HP1-219	1	3.7	1.7	1.6	.8	8.0	4.0	2.2	1.1	3440	13.5	15.0	7.8	8.7	4.4
6HP2-350	2	7.4	3.4	3.2	1.6	16.0	8.0	4.4	2.2	6890	27.0	30.0	15.6	17.3	8.7
6HP2-437	2	7.4	3.4	3.2	1.6	16.0	8.0	4.4	2.2	6890	27.0	30.0	15.6	17.3	8.7
6HP3-525	3	11.1	5.1	4.8	2.4	24.0	12.0	6.6	3.3	10330	40.5	45.0	23.4	25.9	13.0
6HP3-655	3	11.1	5.1	4.8	2.4	24.0	12.0	6.6	3.3	10330	40.5	45.0	23.4	25.9	13.0
6HP4-700	4	14.8	6.8	6.4	3.2	32.0	16.0	8.8	4.4	13800	54.3	60.0	31.4	34.6	17.3
6HP4-875	4	14.8	6.8	6.4	3.2	32.0	16.0	8.8	4.4	13800	54.3	60.0	31.4	34.6	17.3
8HP1-198	1	3.7	1.7	1.6	.8										
8HP1-247	1	3.7	1.7	1.6	.8										
8HP2-396	2	7.4	3.4	3.2	1.6										
8HP2-495	2	7.4	3.4	3.2	1.6										
8HP3-592	3	11.1	5.1	4.8	2.4										
8HP3-740	3	11.1	5.1	4.8	2.4										
8HP4-790	4	14.8	6.8	6.4	3.2										
8HP4-990	4	14.8	6.8	6.4	3.2										

Use On Rooms

35 Degrees

And Higher

Table 6: LP Electrical Data

Model	No. Motors	Motor Data Amps 115/1	Motor Data Amps 208-230/1	Electric Defrost Heater Data, Inc. Drain Pan 208-230/1 Watts	Electric Defrost Heater Data, Inc. Drain Pan 208-230/1 Amps
4LP1-35	1	1.1	.55	1500	6.5
4LP2-52	2	2.2	1.1	2900	12.6
4LP2-70	2	2.2	1.1	2900	12.6
4LP2-89	2	2.2	1.1	2900	12.6
4LP3-106	3	3.3	1.7	4050	17.6
4LP3-136	3	3.3	1.7	4050	17.6
4LP4-179	4	4.4	2.2	5800	25.2
4LP5-225	5	5.5	2.8	5200	22.6
4LP6-268	6	6.6	3.3	6200	27.0
5LP1-42	1	1.1	.55	1500	6.5
5LP2-62	2	2.2	1.1	2900	12.6
5LP2-84	2	2.2	1.1	2900	12.6
5LP2-108	2	2.2	1.1	2900	12.6
5LP3-128	3	3.3	1.7	4050	17.6
5LP3-164	3	3.3	1.7	4050	17.6
5LP4-216	4	4.4	2.2	5800	25.2
5LP5-272	5	5.5	2.8	5200	22.6
5LP6-324	6	6.6	3.3	6200	27.0
6LP1-47	1	1.1	.55	1500	6.5
6LP2-70	2	2.2	1.1	2900	12.6
6LP2-95	2	2.2	1.1	2900	12.6
6LP2-122	2	2.2	1.1	2900	12.6
6LP3-144	3	3.3	1.7	4050	17.6
6LP3-184	3	3.3	1.7	4050	17.6
6LP4-243	4	4.4	2.2	5800	25.2
6LP5-305	5	5.5	2.8	5200	22.6
6LP6-363	6	6.6	3.3	6200	27.0
8LP1-53	1	1.1	.55		
8LP2-79	2	2.2	1.1		
8LP2-107	2	2.2	1.1		
8LP2-137	2	2.2	1.1		
8LP3-162	3	3.3	1.7	These units are to be used only on applicatons of 35° or higher.	
8LP3-208	3	3.3	1.7		
8LP4-274	4	4.4	2.2		
8LP5-345	5	5.5	2.8		
8LP6-410	6	6.6	3.3		

Table 8: GF Electrical Data

Model	No. Motors	Motor Data 115/1	Motor Data 230/1	Electric Defrost 230/1 Watts	Electric Defrost 230/1 Amps
GF-54	2	4.4	2.2	1500	6.6
GF-72	2	4.4	2.2	2000	8.8
GF-105	3	6.6	3.3	3000	13.2
GF-134	3	6.6	3.3	4000	17.4
GF-192	4	8.8	4.4	5000	21.8
GF-280	4	8.8	4.4	6000	26.2

Table 9: Refrigerant Line Capacities (Tons)

Line Size Type L Copper Tubing O.D.	Suction Line (1) Saturated Suction Temperature (F)									Liquid Line Velocity = 100 FPM		
	R-12			R-22			R-502					
	-40	0	+40	-40	0	+40	-40	0	+40	R-12	R-22	R-502
5/8	—	.25	.56	—	.51	1.1	.16	.42	.91	3.0	3.7	2.3
7/8	.25	.67	1.5	.52	1.3	2.9	.43	1.1	2.4	6.2	7.8	4.9
1 1/8	.51	1.4	3.0	1.1	2.7	5.8	.87	2.2	4.8	10.5	13.2	8.3
1 3/8	.90	2.4	5.3	1.9	4.7	10.1	1.5	3.9	8.4	16.0	20.2	12.6
1 5/8	1.4	3.8	8.3	3.0	7.5	16.0	2.4	6.2	13.3	22.7	28.5	17.9
2 1/8	3.0	7.8	17.3	6.2	15.6	33.1	5.0	12.8	27.5	39.5	49.6	31.1
2 5/8	5.3	13.9	30.5	10.9	27.5	58.3	8.8	22.6	48.4	60.9	76.5	48.0
3 1/8	8.4	22.1	48.6	17.5	44.0	92.9	14.1	36.0	77.0	86.9	109.2	68.4
3 5/8	12.6	32.9	72.2	26.0	65.4	137.8	21.0	53.5	114.3	117.6	147.8	92.6
4 1/8	17.8	46.5	101.9	36.8	92.2	194.3	29.7	75.4	161.0	152.9	192.1	120.3
5 1/8	31.9	83.3	182.0	66.0	164.5	346.6	53.2	134.6	287.1	—	—	—

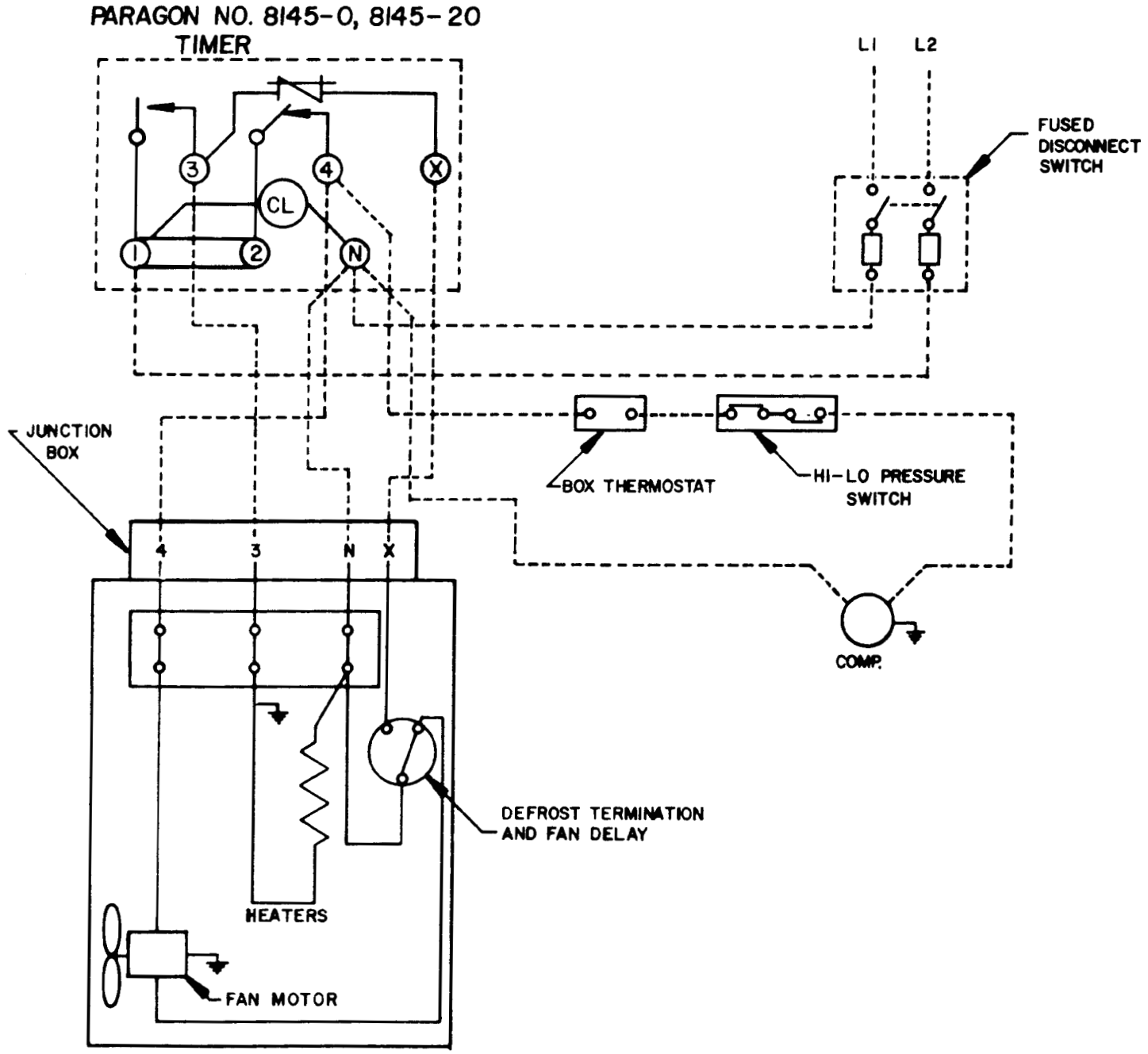
(1) Line sizes based on pressure drop equivalent to 2 degrees per 100 linear feet. For 1 degree per 100 linear feet, use table value x .683.

Table 10: Weight Of Refrigerant In Type L Copper Lines

Line Size O.D. Inches	Pounds Per 100 Lineal Feet								
	Liquid Line 110F			Suction Line 40F		Suction Line -20F	Discharge Line 115F		
	R-12	R-22	R-502	R-12	R-22	R-502	R-12	R-22	R-502
5/8	12.6	11.3	11.7	.21	.25	.26	.65	.80	1.16
7/8	26.1	23.4	24.2	.43	.51	.54	1.34	1.68	2.42
1 1/8	44.8	40.0	41.5	.74	.87	.92	2.30	2.86	4.15
1 3/8	67.6	60.5	62.8	1.02	1.31	1.38	3.47	4.34	6.28
1 5/8	94.5	85.0	88.0	1.57	1.84	1.94	4.90	6.10	8.80
2 1/8	166.0	150.0	155.0	2.77	3.25	3.42	8.60	10.70	15.50
2 5/8	258.0	232.0	240.0	4.30	5.03	5.30	13.30	16.60	24.00
3 1/8	366.0	330.0	340.0	6.10	7.15	7.53	18.90	23.60	34.00
3 5/8	495.0	446.0	461.0	8.25	9.65	10.19	25.60	31.90	46.10
4 1/8	646.0	584.0	602.0	10.80	12.60	13.30	33.40	41.60	60.20

DIAGRAM NO. 1

BOX THERMOSTAT CONTROLS LINE CURRENT TO COMPRESSOR.
HEATER CURRENT CONTROLLED DIRECTLY BY TIMER.
DO NOT USE C.P.R. VALVE ON THIS SYSTEM.
PRESSURE LIMIT EXPANSION VALVE RECOMMENDED FOR THIS SYSTEM.



ELECTRIC DEFROST UNIT

A 40000

---------- SUGGESTED FIELD WIRING

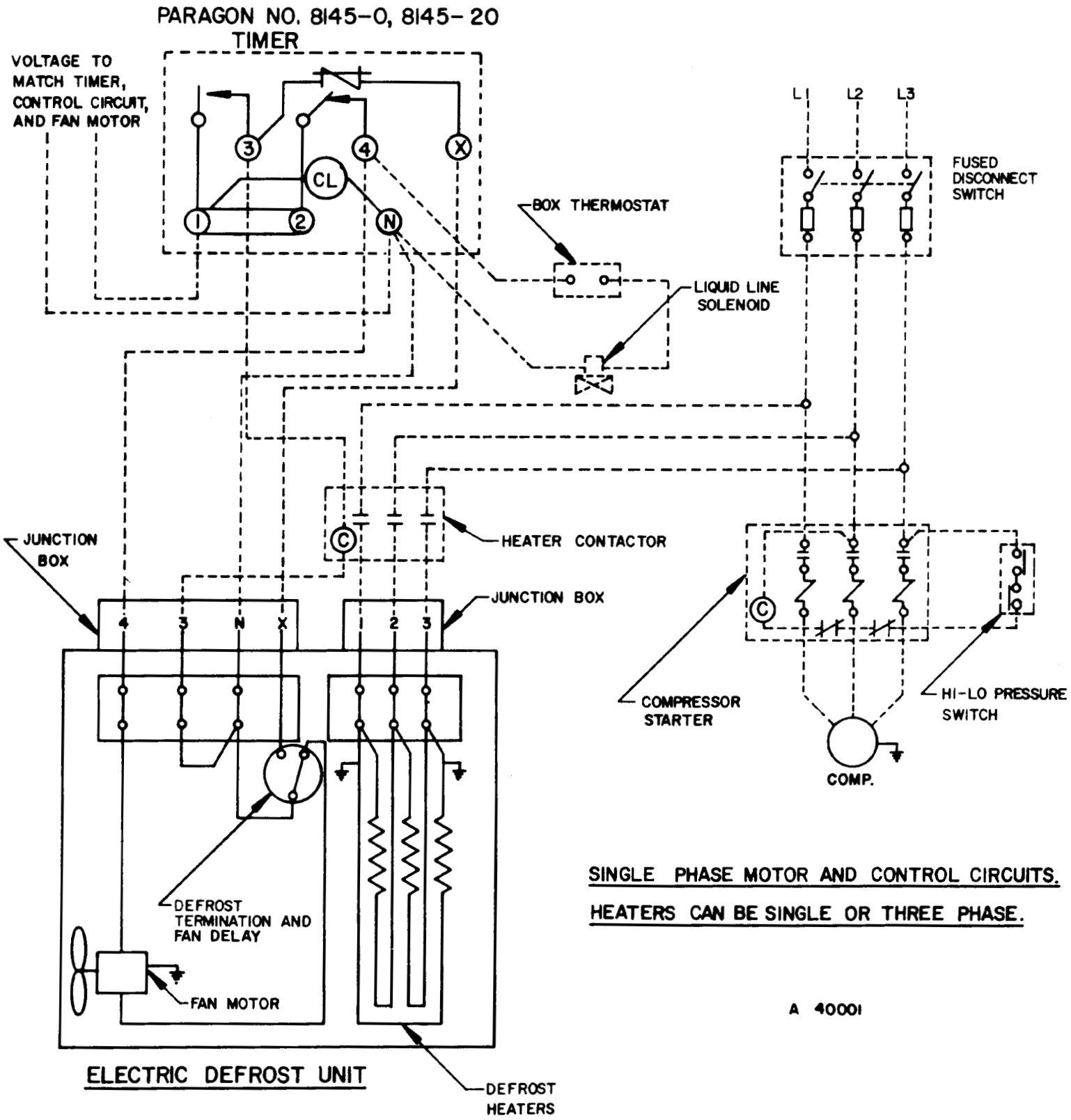
———— INTERNAL WIRING

SINGLE PHASE

USED ON MODELS - HP-1, LP-2 THRU LP-6, GF-54 THRU GF-280

DIAGRAM NO. 2

BOX THERMOSTAT CONTROLS LIQUID LINE SOLENOID.
COMPRESSOR SHUTS OFF BY PRESSURE CONTROL.
HEATERS CONTROLLED BY CONTACTOR.



SINGLE PHASE MOTOR AND CONTROL CIRCUITS.

HEATERS CAN BE SINGLE OR THREE PHASE.

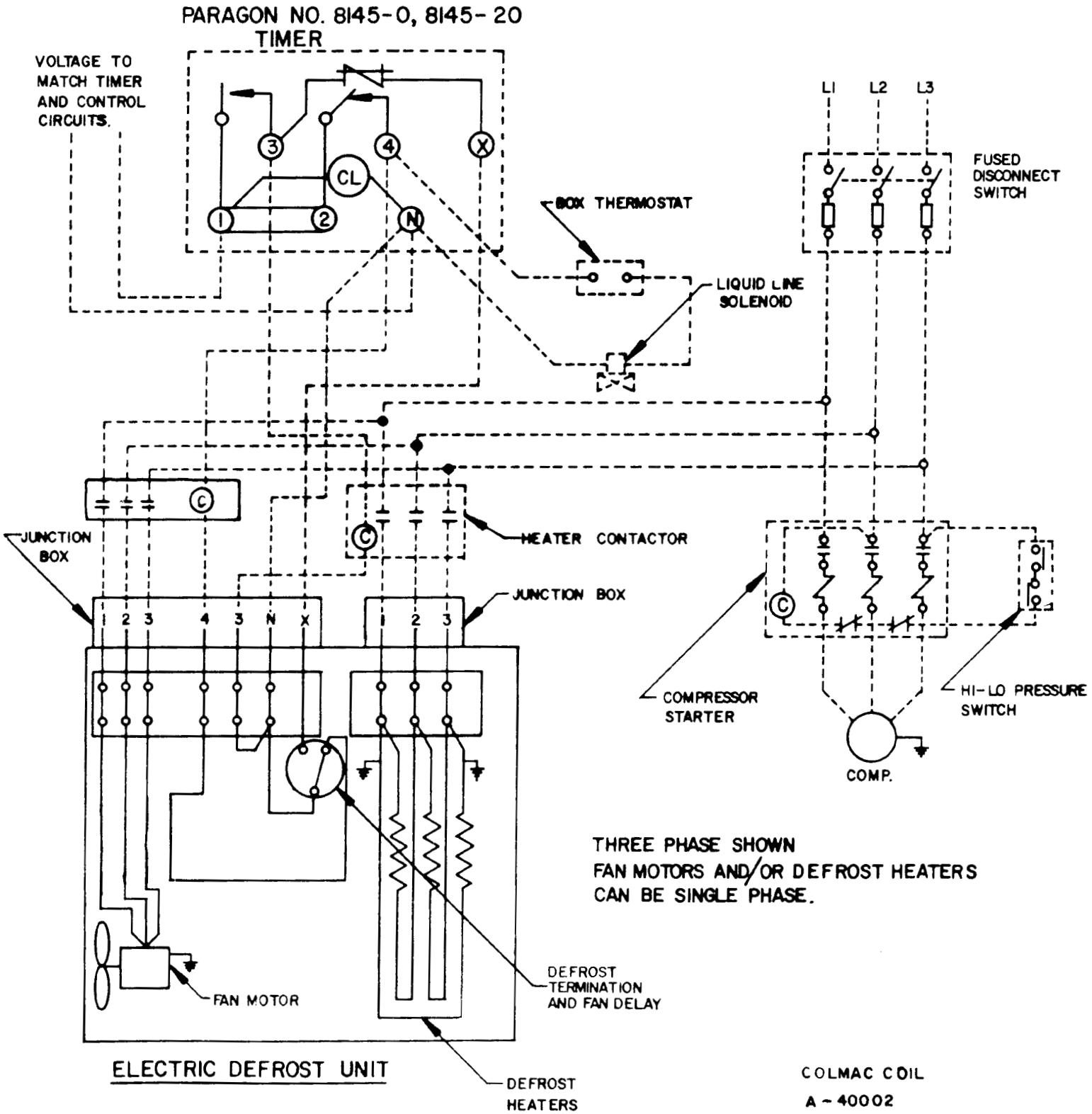
A 40001

USED ON MODELS - HP-1, LP-5 AND LP-6

DIAGRAM NO. 3

REVISED 10-6-80

BOX THERMOSTAT CONTROLS LIQUID LINE SOLENOID.
COMPRESSOR SHUTS OFF BY PRESSURE CONTROL.
FAN MOTORS AND DEFROST HEATERS CONTROLLED BY CONTACTORS.



ELECTRIC DEFROST UNIT

COLMAC COIL
A-40002

- - - - - - SUGGESTED FIELD WIRING
——— INTERNAL WIRING

USED ON MODELS – HP-1 THRU HP-4.

DIAGRAM NO. 4

REVISED 10 6 80

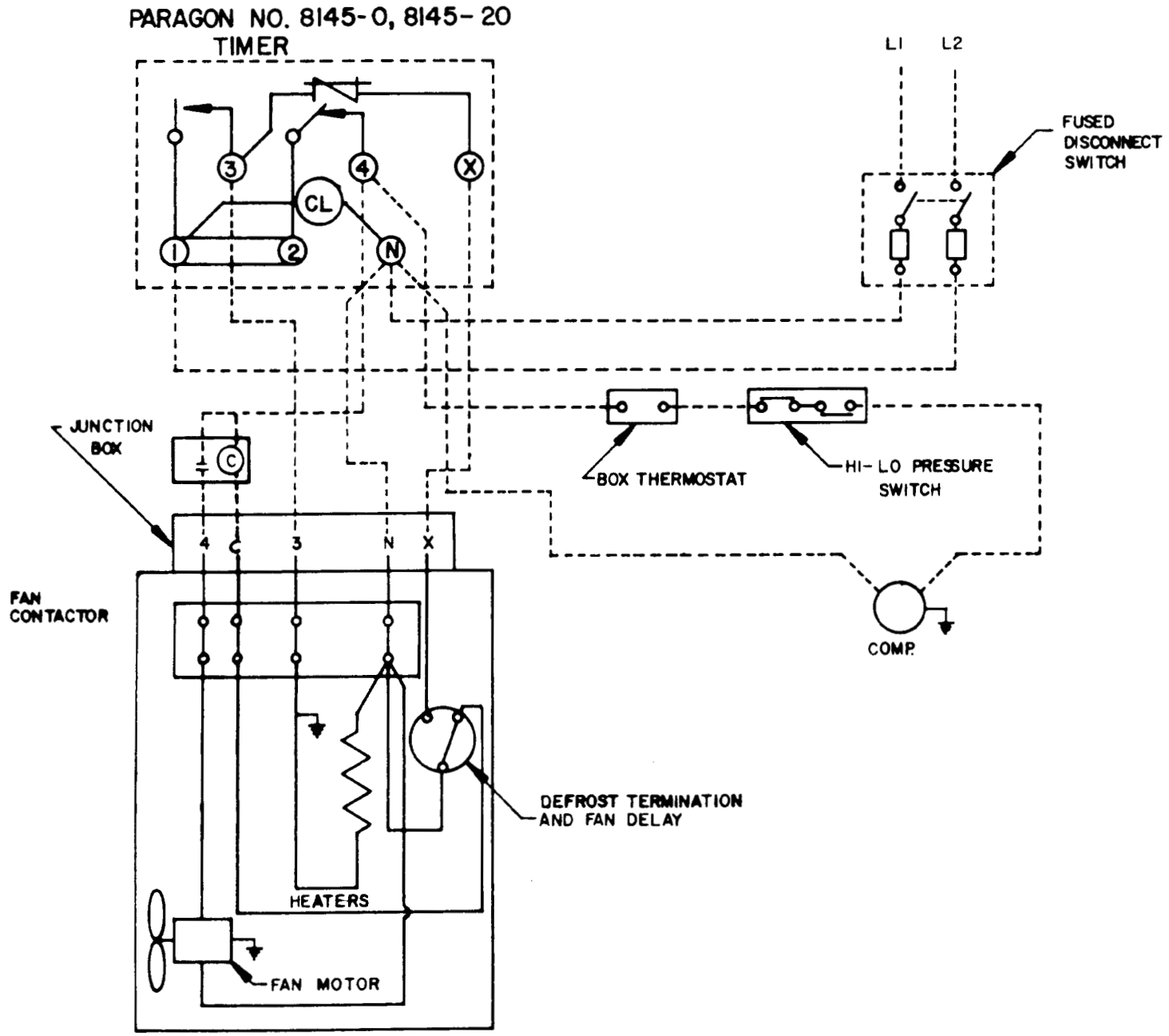
BOX THERMOSTAT CONTROLS LINE CURRENT TO COMPRESSOR.

HEATER CURRENT CONTROLLED DIRECTLY BY TIMER.

FAN MOTORS CONTROLLED BY CONTACTOR.

DO NOT USE C.P.R. VALVE ON THIS SYSTEM.

PRESSURE LIMIT EXPANSION VALVE RECOMMENDED FOR THIS SYSTEM.



ELECTRIC DEFROST UNIT

COLMAC COIL

A 4-0003

---------- SUGGESTED FIELD WIRING

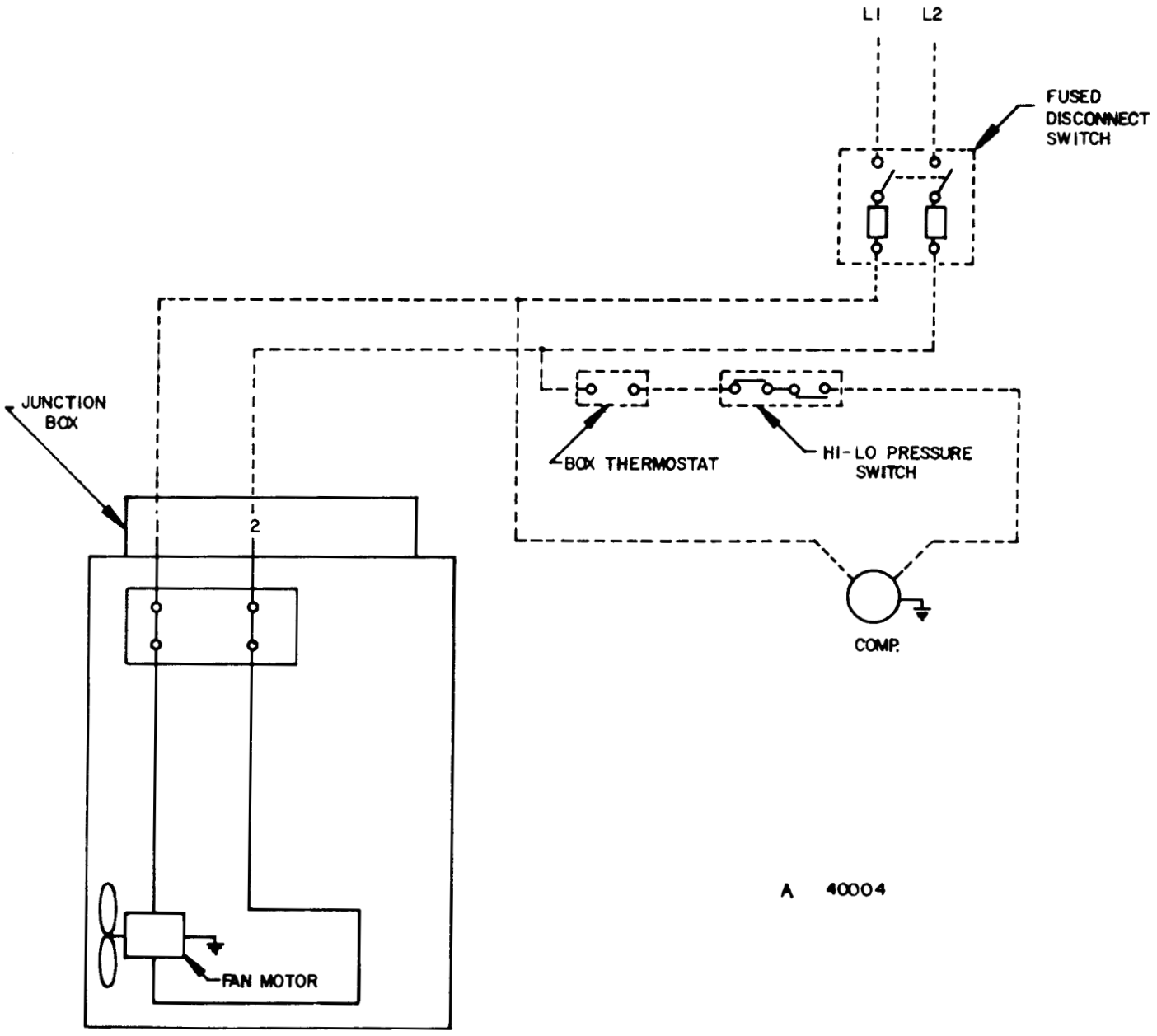
———— INTERNAL WIRING

SINGLE PHASE

USED ON MODELS— HP-2 THRU HP-4

DIAGRAM NO. 5

BOX THERMOSTAT CONTROLS LINE CURRENT TO COMPRESSOR.
MOTORS CAN BE SINGLE OR THREE PHASE, SINGLE PHASE SHOWN.



UNIT COOLER

- - - - - - - - SUGGESTED FIELD WIRING

———— INTERNAL WIRING

USED ON MODELS – LP-2 THRU LP-6, HP-1 THRU HP-4, GF-54 THRU GF-280

OPERATION

START-UP

Before Start-Up

1. Make sure unit voltage agrees with supply voltage.
2. Make sure system is wired correctly.
3. Check to make sure all electrical terminals are tight.
4. Make sure all piping is done completely and in accordance with good practice.
5. Make sure fan set screws are tight.
6. Make sure that suction, discharge and receiver service valves are open.
7. Make sure unit is mounted securely using all hangers and is leveled.
8. Pour water into the drain pan to check for proper drainage of drain pan and drain line.

After Start-Up

1. Check the compressor for possible overload immediately after start-up.
2. Check the system for proper refrigerant and oil charge.
3. Check the expansion valve superheat setting. It is important that the valve is set properly for efficient operation and even frost formation.
4. Heavy moisture loads are usually encountered when starting a system for the first time. This will cause rapid frost buildup on the unit. During the initial pull-down we suggest that the frost buildup be watched and that the unit be defrosted manually as required.

NORMAL UNIT OPERATION

COOLING CYCLE

In a typical system operation, wired as shown in Diagram 2, power is supplied constantly to the unit fan motors. The room temperature is controlled by a room thermostat which operates the liquid line solenoid valve to control the compressor operation.

DEFROST CYCLE

The defrost cycle is initiated by the defrost timer. The defrost timer circuit shuts off the unit fans, closes the liquid line solenoid valve to initiate compressor pump-down and energizes the defrost heaters. The heaters warm the coil causing the frost to melt and drain away. When the sensor bulb on the termination thermostat reaches the setpoint it terminates the defrost cycle. The defrost heaters are de-energized and the liquid line solenoid valve is energized allowing the compressor to run. The unit fans will not restart until the coil temperature has pulled down below the freezing point. If the defrost termination thermostat fails, the "failsafe" setting on the standard Paragon timer will automatically terminate the defrost. See the section on "Setting the Defrost Timer" in this bulletin for instruction on setting the "failsafe".

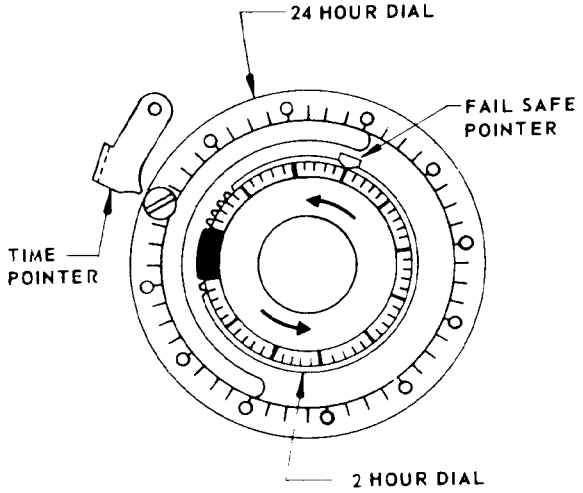
Do not set timer for excessively long defrost periods. 50 minutes or less should be adequate for most installations. On multiple unit installations with a single timer, all of the termination thermostats are wired in series so the defrost cycle is not terminated until all of the thermostats have switched. If one or more units should have an inoperative coil heater, the defrost cycle can be prolonged to the point where other units are overheating. To prevent this possibility, it is important that the "failsafe" setting on the timer does not exceed 50 minutes. See the section on "Setting Defrost Timer" in this bulletin. Also, it is important that the units are checked regularly for inoperative defrost heaters. On multiple unit installations, the fan delay for all the units is wired through the termination thermostat in one master unit. However, it is necessary that all of the termination thermostats switch when the system restarts after a defrost cycle. If they do not, they will be in the termination position when the next defrost cycle is initiated. With the factory setting of 25°F (4°C), it is possible that they may not switch in rooms operating at around 30°F (-1°C). To alleviate this problem, the thermostat settings on all except the master unit can be adjusted to a higher setting. The following paragraph describes how to change this setting.

DEFROST THERMOSTAT

The defrost duration is determined by the setting of the defrost termination thermostat. Initially the thermostat should be set at midrange. This will terminate the defrost at about a 60°F (16°C) bulb temperature which will be satisfactory for most applications. However, a somewhat longer or shorter defrost can be obtained by rotating the control clockwise for a longer defrost and counter clockwise for a shorter defrost. The fan delay temperature setting of the thermostat is factory set at 25°F (-4°C).

SETTING DEFROST TIMER

The standard timer furnished by your distributor controls the frequency of defrosts and also provides a "failsafe" feature that terminates the defrost after a set time if the termination thermostat fails to function properly. The standard time is 240 volts. The timer should be mounted outside the refrigerated space. Figure five shows the timer dial.



1. To set the number of defrosts every 24 hours screw a pin into the outer dial at each desired time of defrost.

2. To set the time of day, grasp the center knob and rotate counter-clockwise until the correct time of day on the outer dial is lined up with the pointer. Do not attempt to set the timer by grasping and turning the outer dial.

3. To set the "failsafe" timer, push down the pointer on the inner dial and adjust it to the desired time in minutes. The timer should initially be set for 2 to 4 defrost cycles per day. However, each installation should be checked so the system operates efficiently with a minimum number of defrost cycles. The "failsafe" setting should not normally exceed 50 minutes.

TYPICAL TIMER SETTINGS

Refrigerated Space	Defrosts	Duration Of Defrost
35°Cooler	6 per day	20 minutes each
28° Cooler	3 per day	30 minutes each
-15° Cooler	2 per day	40 minutes each

MAINTENANCE

GENERAL

The system should be checked periodically for proper defrost timing because the amount of frost and pattern can vary greatly. Frost accumulation is dependant on the temperature of the space, the type of product stored, entry of a new product, etc. It may be necessary to occasionally re-adjust the defrost timing. Under routine conditions maintenance should review the following items at least once every 6 months.

1. Check refrigeration system for charge level, oil level, and any evidence of leaks.

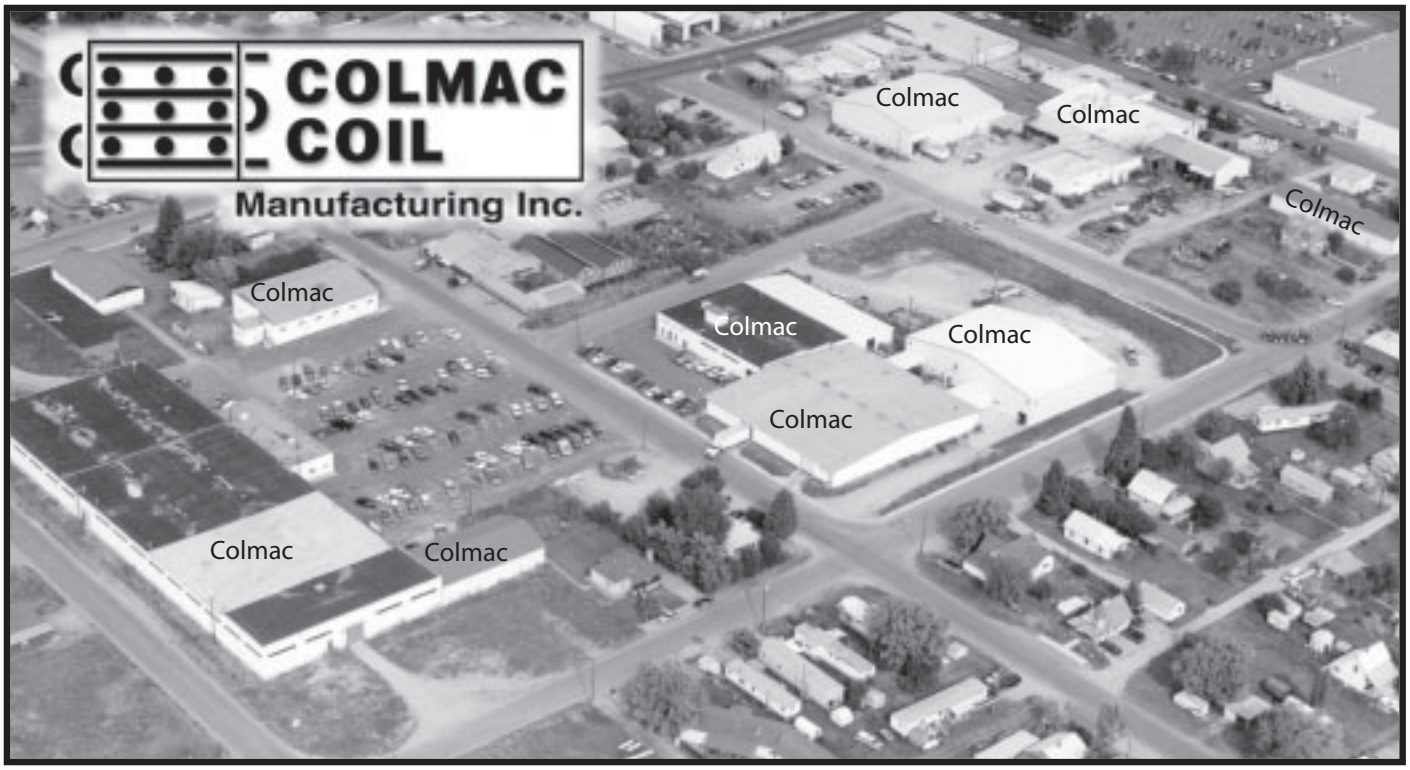
2. Tighten all electrical connections.

3. Check operation of control system and proper functioning of defrost heaters, drain line heaters, thermostats, etc.

4. Clean the coil surface.

DEFROST HEATER REPLACEMENT

1. Make sure that electrical power to the heater is turned off.
2. Remove access cover on the electrical connection end of the unit.
3. Disconnect the heater leads.
4. Disconnect the heater ground straps
5. Remove the drain pan
6. Remove and replace the defective heaters.
7. Install the drain pan
8. Connect the heater ground straps and heater leads.
9. Install the access cover and turn on the electrical power.



A Tradition of Quality

Colmac Coil was founded in 1971 and has been distinguished for its commitment to quality in the new and replacement coil markets with listings, certifications, and code markings such as ARI, ASME, UL, CSA, and CRN. Located in the Northwest USA, Colmac has grown to prominence as a trusted coil manufacturer with commercial/industrial heating & cooling, HVAC and refrigeration customers worldwide. Colmac has a network of over 250 factory representatives in over 80 sales offices around the world.

QUALITY COLMAC PRODUCTS

HEAT TRANSFER PRODUCTS

HVAC/Industrial/OEM

- Heating and Cooling Coils
- Fluid Coolers
- Heat Pipe Coils

REFRIGERATION PRODUCTS

Industrial/Commercial

- Evaporators - Air Coolers
- Air-Cooled Condensers
- Blast Freezers
- Tube Bundles
- Hydro Coolers
- Bunker Coils

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