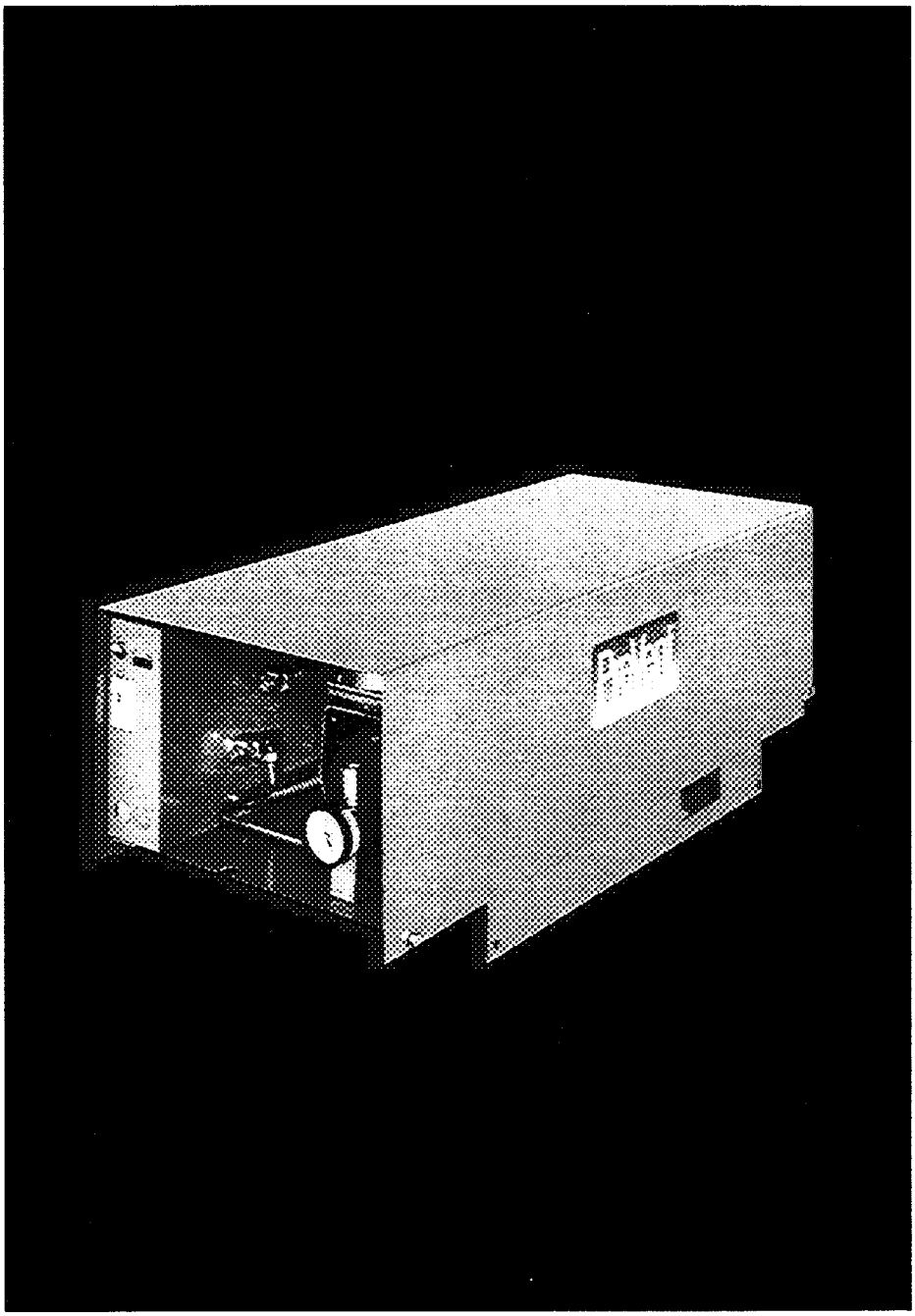
Carrier
HEATING & COOLING

Product Data

17/19 Series PreVent™ High Efficiency Purge 50/60 Hz



Carrier's 19DK PreVent High-Efficiency Purge conserves existing supplies of chloroflurocarbon (CFC-11, CFC-113, CFC-114) in centrifugal chillers and minimizes CFC emissions during chiller service.

- Obtains efficiencies of up to 96% non-CFC gas for each purge cycle for maximum environmental protection and cost savings
- Optimizes chiller efficiency
- Available as a factory-mounted unit or as an easy-to-install field retrofit
- Optionally compatible with HCFC-123
- Can be isolated during installation, reducing downtime

Features/Benefits

Carrier's newest CFC barrier product features a patented carbon technology which helps to protect the environment from excessive CFC emissions and helps to meet the requirements of the Clean Air Act.

Preserves and recovers refrigerant

The PreVent purge includes a vacuum pump, compressor, and carbon-filled PVC tank containing activated charcoal. Our unique design retains refrigerant vapor in the carbon tank while allowing noncondensables to be discharged. The PreVent purge also increases chiller performance by maintaining refrigerant at optimal levels throughout the process. The PreVent unit removes noncondensables even when the chiller is not in operation. The PreVent purge uses this innovative method to obtain efficiencies of 96% non-CFC gas by weight and 99% non-CFC gas by volume during the purging cycle.

PreVent™ is versatile, too

It has been designed to operate with many types of centrifugal chillers containing CFC 11, 113, 114, and HCFC 123. Special considerations are needed for applications using CFC-113. See Application Data. The purge accessory also features a new, optional purge condensing chamber with dual cooling coils — one for refrigerant and the other for city water. This water piping provides a cooling source for purge operation when the chiller is in the off mode. The PreVent unit's unique design allows for the purge to operate while the chiller is running or shut down. It also enables the operator to remove air that may have entered the chiller prior to start-up.

Available factory-mounted or as field retrofit

The PreVent purge can be factory mounted on all new low-pressure Carrier centrifugal chillers It can also be retrofitted to any manufacturer's low pressure centrifugal chiller. See Dimensions section. The PreVent unit must operate in conjunction with a purge condensing chamber designed to operate at 45 psig (310 kPa). Those chillers that do not contain the proper condensing chamber must have one installed along with the PreVent unit Field retrofits can be mounted on or beside the chiller with minimal piping and wiring connections. As an added convenience, your HVAC contractor can isolate the purge, significantly reducing downtime during installation.

Safety features — for added protection

Three safety switches are designed into the control circuit and mounted directly on the purge condensing chamber. These switches are automatic reset and non-adjustable:

High-pressure switch — Shuts the PreVent system down in case pressure in the purge condensing chamber reaches 60 psig (414 kPa). This switch will reset at 40 psig (276 kPa).

Low-pressure switch — Shuts the PreVent system down if pressure in the purge condensing chamber runs below 15 psig (103 kPa) and the carbon tank vent solenoid is energized. It will reset at 30 psig (207 kPa)

Loss of cooling switch — Shuts the PreVent system down if the cooling flow to the refrigerant or water cooling coil should stop. These switches located on each coil entering the condensing chamber will close at 90 F (32 C) and reset at 75 F (23 C).

Minimal servicing

The PreVent unit does not require any scheduled maintenance other than periodic oil changes, leak testing and cleaning of the control panel components. Therefore, the PreVent unit is inexpensive to service Its protective cover just lifts up for easy access to all components.

Component description

The carbon filled PVC tank uses activated charcoal to adsorb refrigerant and to filter noncondensables. The tank has a pressure relief set at 25 psid (172 kPa) between the tank and the chiller evaporator. It has a maximum operating pressure of 10 psig (69 kPa).

The vacuum pump removes refrigerant from the activated charcoal and returns it to the chiller for recycling. The ½-hp, diaphragm-type pump is equipped with a permanent split-capacitor motor. The motor voltage is 115-1-50/60 Hz.

A tank pressure switch automatically vents noncondensables when the tank pressure reaches 10 psig (69 kPa). At 2 psig (17 kPa), the pressure switch automatically activates the vacuum pump to start the recycling operation.

Semi-hermetic compressor has a design pressure of 60 psig (414 kPa) and maximum operating pressure of 45 psig (310 kPa). The reciprocating compressor increases pressure in existing purge chamber to 45 psid (310 kPa) for applications using Refrigerant-11

Oil separator contains float valve assembly to return oil to the compressor. It has a design pressure of 60 psig (414 kPa) and a maximum operating pressure of 45 psig (310 kPa).

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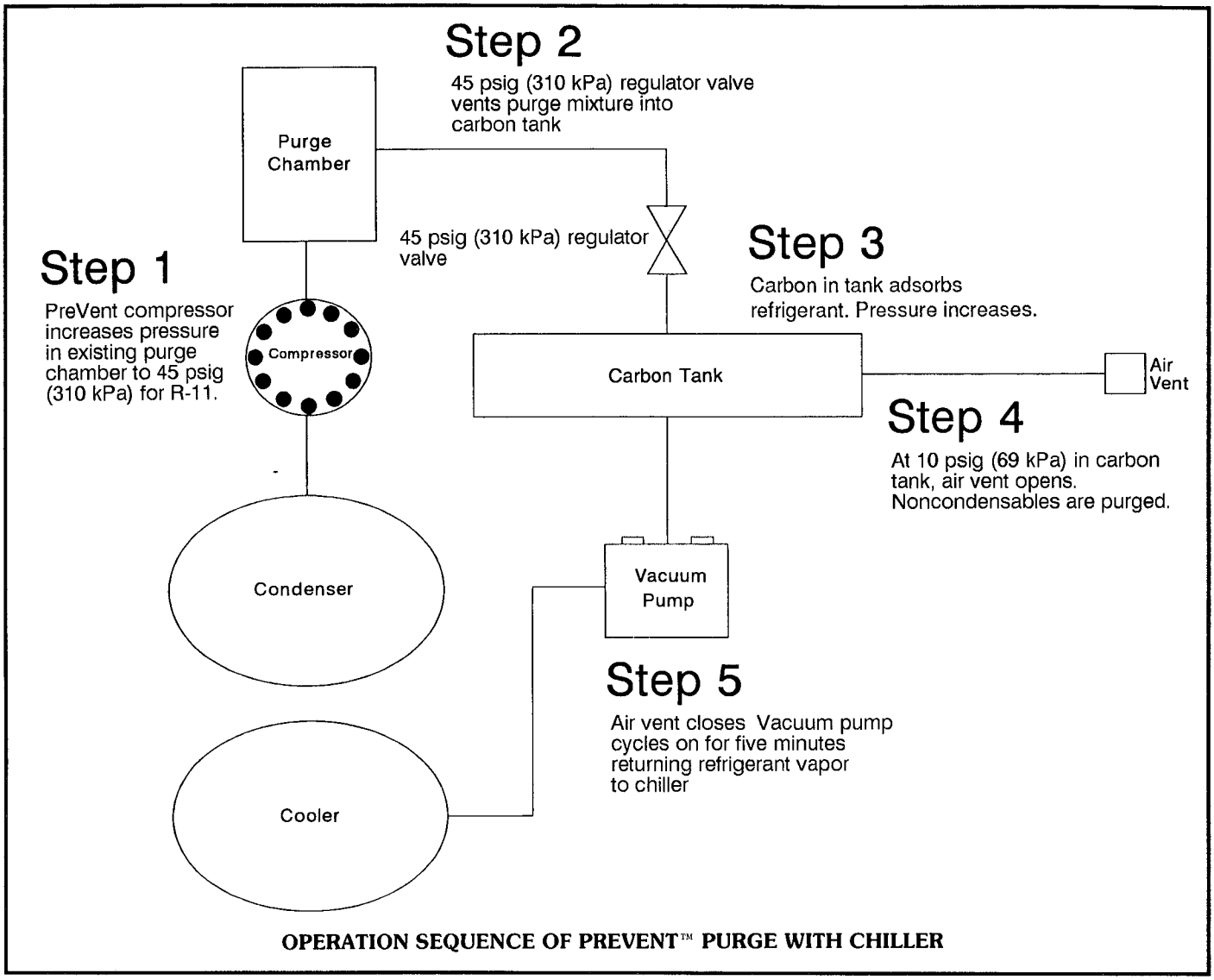


OPERATION SEQUENCE OF PREVENT™ PURGE WITH CHILLER

Options and Accessories

There are two field-installed assemblies available for retrofit to chillers which have a single cooling coil condensing chamber: Assembly 1 — 19DK 111 794 (50 Hz) and Assembly 2 — 19DK 111 804 (60 Hz). The following parts are included when ordering Assembly 1 or 2:

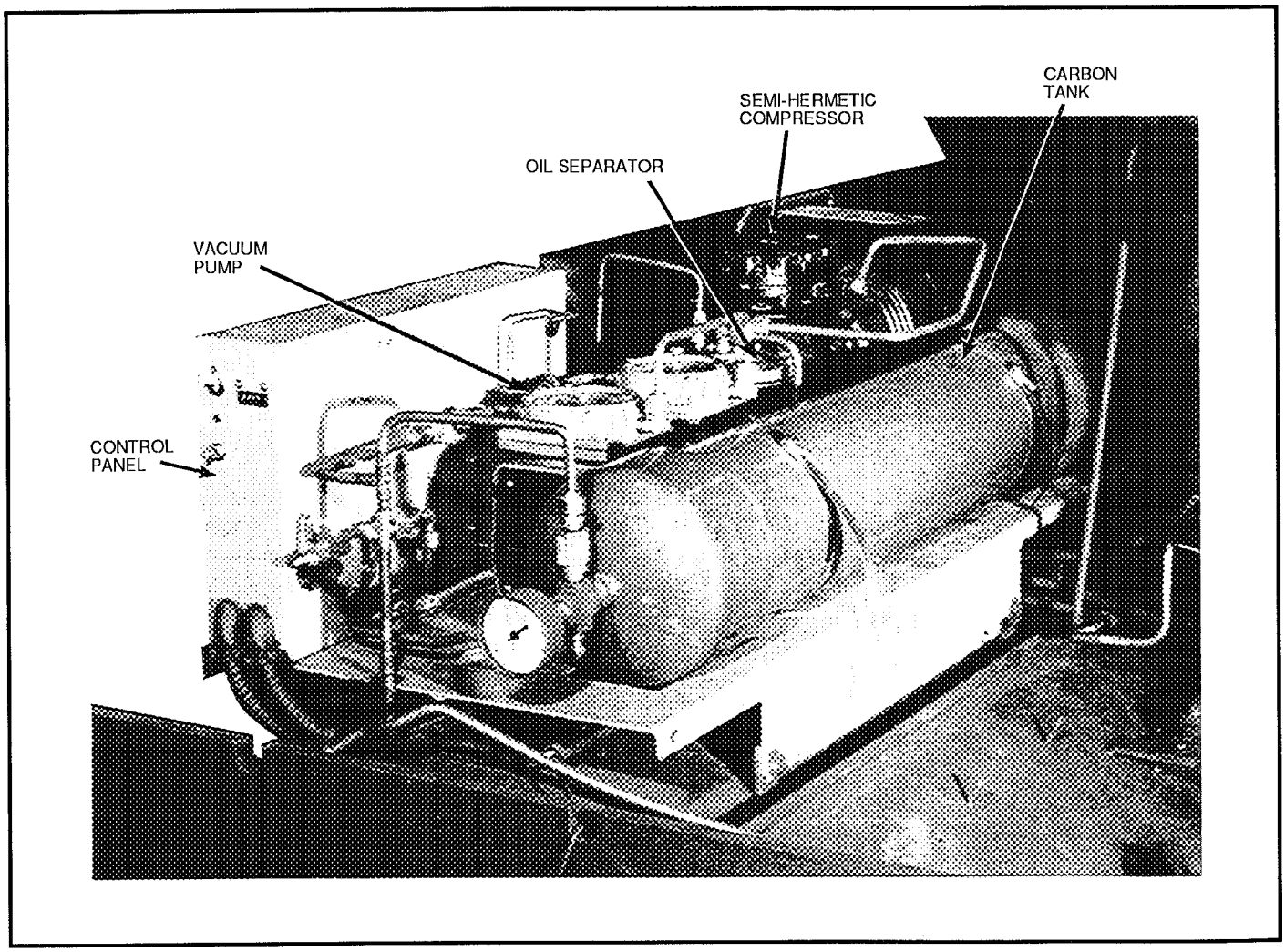
- PreVent unit
- regulating valve
- pressure gage
- junction box
- junction box cover
- screws (junction box cover)
- low-pressure switch
- high-pressure switch
- loss-of-cooling switch

There are two field-installed assemblies available for retrofit to chillers which have a dual cooling coil condensing chamber. Assembly 3 — 19DK 111 814 (50 Hz) and Assembly 4 — 19DK 111 824 (60 Hz). When ordering these assemblies, the PreVent unit is included. See Dimensions section. However, the dual cooling coil condensing chamber with all the safety controls must be ordered separately.

ITEM†	QTY	FIELD INSTALLED
Junction Box	1	X
Junction Box Cover	1	X
Regulating Valve		
R-11 and R-114	1	X
R-113	1	X
Pressure Gage (0-60 psi/414 kPa)	1	X
High-Pressure Switch	1	X
Low-Pressure Switch	1	X
Loss-of-Cooling Switch		
for ½-in. tube (12.70)	2	
for ⅝-in. tube (15.86)	1	X
***Suction Accumulator**	1	X
***Shutdown Solenoid**	1	X
***Isolation Relay (KA and KB) (17/19 dual DR only)**	2	X
***Orifice**	2	X
***Single Coil Condensing Chamber**	1	X
***Dual Coil Condensing Chamber**		
With Safeties		X
Without Safeties		X

*Ordered separately as needed.
†For part no. refer to PreVent Replacement Parts catalog.

Machine components



Physical data

50/60 Hz	SIZE	ENGLISH	(SI)
DRY WEIGHT	lbs (kg)	230	(104)
CARBON TANK			
Design Pressure	psid (kPa)	25	(172)
Max Operating Pressure	psig (kPa)	10	(69)
COMPRESSOR			
Design Pressure	psig (kPa)	60	(414)
Max Operating Pressure		45	(310)
Suction Connection	in.	3/8*	
Flow Rate			
50 Hz	cfm (m³/s)	2 3	(0012)
60 Hz	cfm (m³/s)	2 2	(001)
Horsepower		1/2	
VACUUM PUMP			
Design Pressure	psig (kPa)	10	(69)
Max Operating Pressure	psig (kPa)	2	(14)
Flow Rate			
50 Hz	cfm (m³/s)	1 7	(0008)
60 Hz	cfm (m³/s)	2.0	(.0009)
Max. Vacuum	in. Hg (kPa)	29	(98)
Horsepower		1/2	
OIL SEPARATOR	psig (kPa)		
Design Pressure		60	(414)
Max Operating Pressure		45	(310)
HIGH-PRESSURE SWITCH	psig (kPa)		
Cutout		60	(414)
Reset (Auto.)		40	(276)
LOW-PRESSURE SWITCH	psig (kPa)		
Cutout		15	(103)
Reset (Auto.)		30	(207)
LOSS-OF-COOLING SWITCH (LOC)	F (C)		
Cutout		90	(32)
Reset (Auto.)		75	(23)

*Male Flare

Performance data

The PreVent™ unit will operate in a high-efficiency mode whether the chiller is operating or not. The average efficiency is 96% For a given discharge from the unit, 96% by weight will be non-CFC gas, and 4% by weight will be refrigerant. The average volume gas discharge is approximately 1.05 G (4 L). This can occur at a maximum rate of about 6 minute intervals. The limiting factor in achieving this rate is the 5 minute pump down cycle necessary to remove the adsorbed refrigerant from the carbon tank.

Electrical data

Hz	NOMINAL V-PH-HZ	COMPR (Each)		POWER SUPPLY
		RLA	LRA	MCA
60	115-1-60	7.8	45.0	15
50	115-1-50	7.1	45.2	15

LEGEND

COMPR — Compressor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps (Complies with National Electrical Code (U.S.A.), Section 430-24.
RLA — Rated Load Amps

NOTES:
1. The MCA values are calculated in accordance with National Electrical Code Article 440 (U S.A. Standard).
2. Motor RLA and LRA values are established in accordance with Underwriters' Laboratories Standard 46S (U.S.A. Standard).

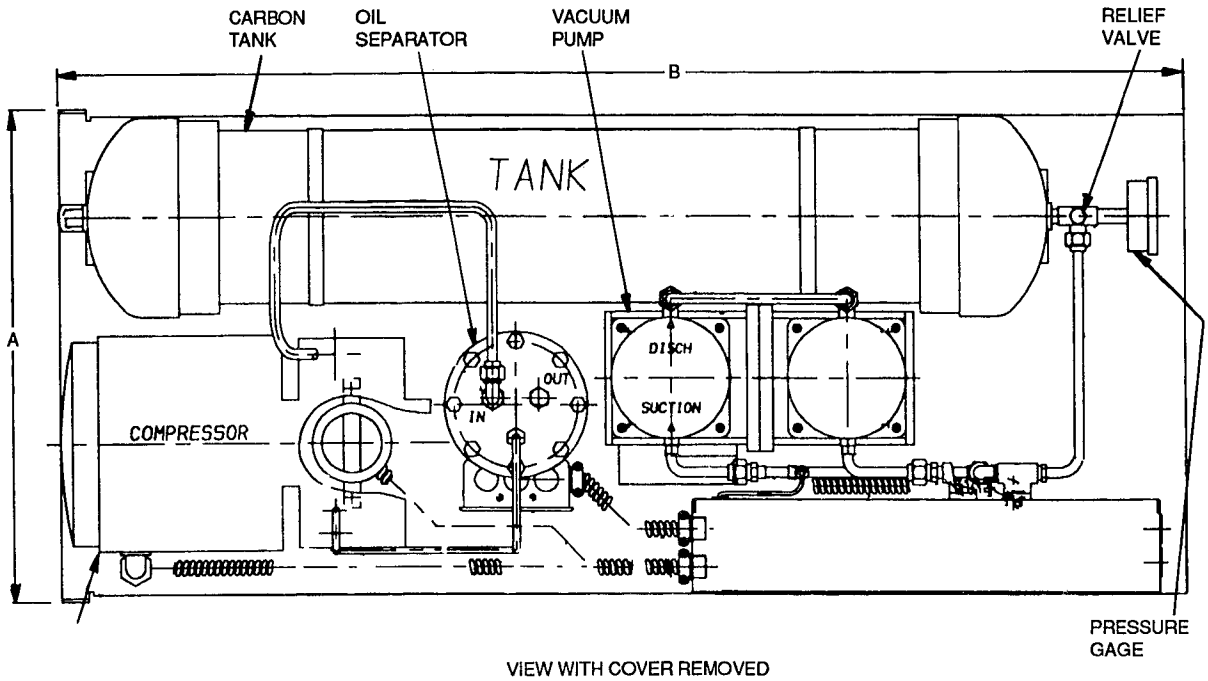
CANADIAN STANDARDS ASSOCIATION

EQUIPMENT TESTING LABS CERTIFIED

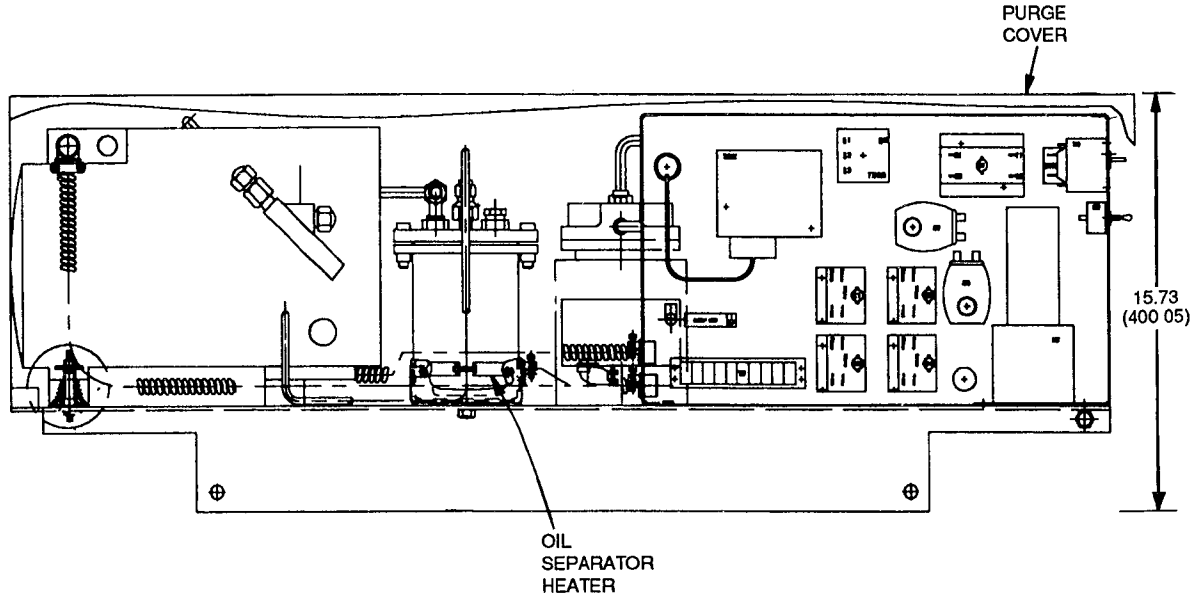
Dimensions

PHYSICAL DIMENSIONS
PREVENT™ UNIT

UNIT SIZE	A	B	WEIGHT EMPTY	
			Lb	Kg
19DK	18.25″ (469.90)	43″ (1090.2)	230	104



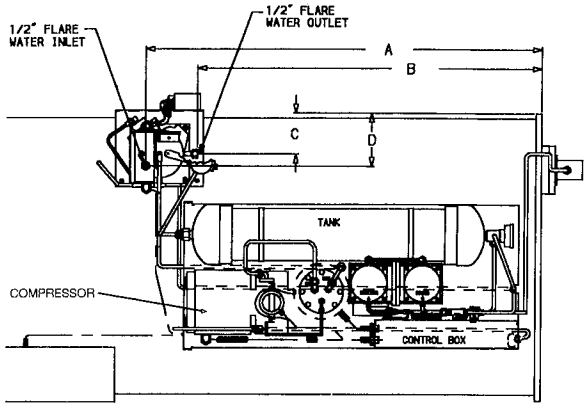
VIEW WITH COVER REMOVED

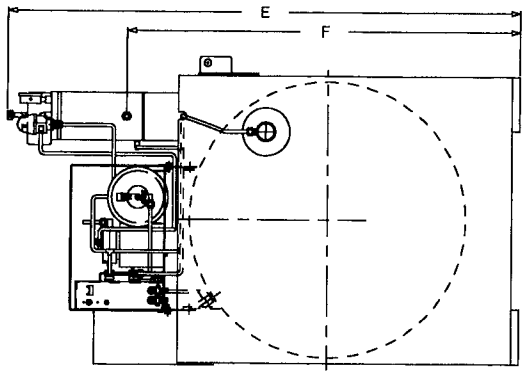


NOTE: COVER IS OPEN ON BOTH ENDS

PHYSICAL DIMENSIONS
FACTORY-INSTALLED PREVENT UNIT ON 19DK/DM CHILLER

UNISHELL SIZE	A		B		C		D		E		F	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
42-47	49.65	1261.11	43.14	1095.75	5.18	131.57	6.67	169.41	64.26	1632.20	49.40	1254.76
61-65	33.51	851.15	27.00	685.80	6.56	166.62	8.05	204.21	70.70	1795.78	55.84	1418.33
71-78	33.51	851.15	27.00	685.80	9.18	233.17	10.67	271.01	78.62	1996.94	63.76	1619.50





Application data

Range of application

The PreVent™ purge will only operate on chillers that are equipped with a condensing chamber designed for a 45 psig (310 kPa) operating pressure. This type of chamber has been a standard item on all Carrier low pressure chillers (some model 19DA chillers and all chillers from 19DG through 19DR). Some of the Carrier chillers that were not built with this condensing chamber (models 17M, 19C, 19D, and some 19DA chillers) may have already been retrofitted in the field. However, if the current chiller in service does not have or has not been retrofitted with this condensing chamber, the chamber can be ordered separately and must be installed with the PreVent purge.

Refrigerant

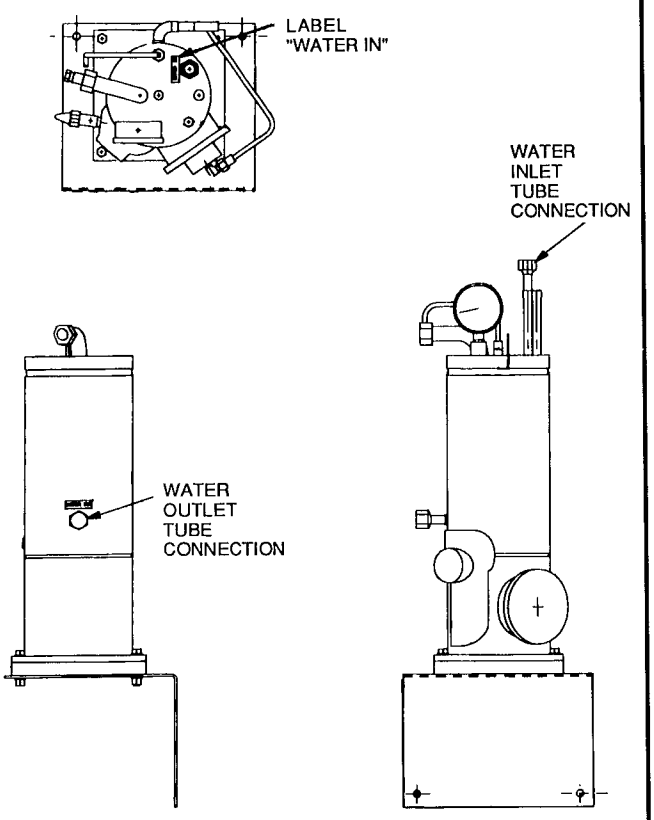
The 17/19 Series PreVent purge is designed to operate on chillers containing CFC-11, CFC-113, CFC-114, and HCFC 123. Special provisions are needed for applications using CFC-113: a low pressure switch is not used; and the regulating valve is set at 15 psi (103 kPa) instead of 45 psi (310 kPa). See the PreVent purge installation manual for further details.

Purge condensing chamber water supply

City water may be used to provide a cooling source for purge operation when the chiller is in the off mode. Water entering the chamber must meet the following requirements:

Maximum inlet temperature ..... 85 F (29 C)
Maximum inlet working pressure . .. 150 psi (1,034 kPa)
Flow, gpm (L/S) .... 3 max - .1 min
(11.3 max - 3.78 min)

TYPICAL DUAL COIL CONDENSING CHAMBER



NOTES:
1. Inlet coil piping is ½ in. (12.70 mm) copper
2. City water exiting the cooling coil should be piped to a floor drain.

Controls

Control system

The semi-hermetic compressor operates continuously with the chiller when it is in the automatic position. It shuts down only when the vacuum pump is evacuating the carbon tank. Non-CFC gas is exhausted to the atmosphere when an accumulation of 10 psig (69 kPa) occurs in the carbon tank. When operating chillers with CFC-11 and CFC-114, the loss-of-cooling switch and low and high-pressure switches must be open in order for continued operation of the purge. If the low-pressure and loss-of-cooling switches are closed during the exhaust cycle, the PreVent™ unit will shut down and must be manually reset. The same sequence will occur when the unit operates with CFC-113, only the low-pressure switch is not used. If the high pressure switch is closed at any time during the unit's operation with either refrigerant, the switch will shut it down.

Features

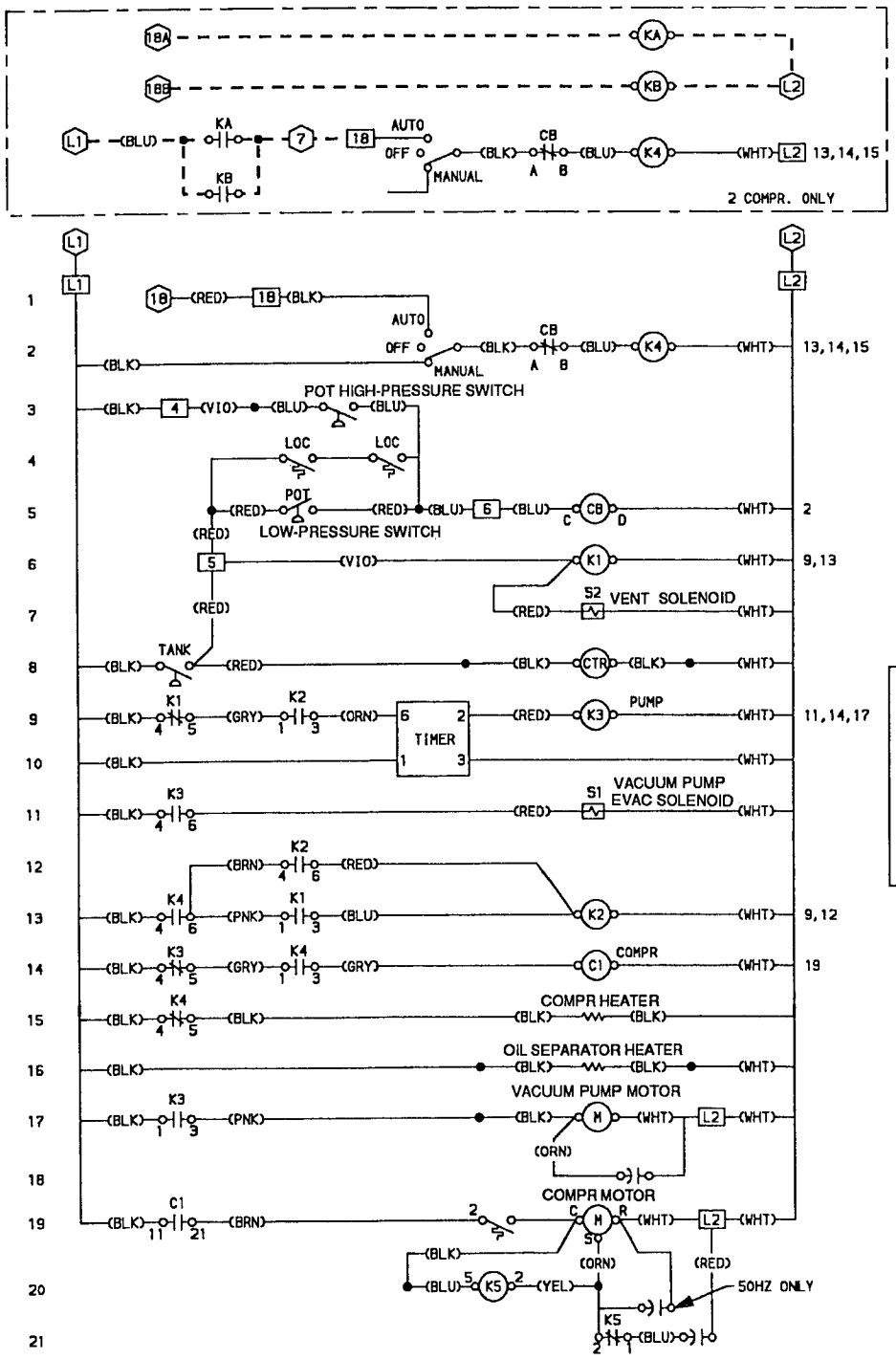
Safety cutouts:

Refrigerant High-Pressure
Refrigerant Low-Pressure
Circuit Breaker
Carbon Tank Relief Valve
Loss-of-Cooling

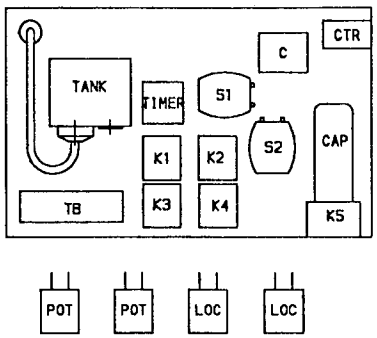
System control:

Time delay relay
Refrigerant Condensing Chamber Regulating Valve (Adjustable)
Carbon Tank Pressure
Auto.-Off-Manual Toggle Switch

Control wiring schematic



COMPONENT ARR.



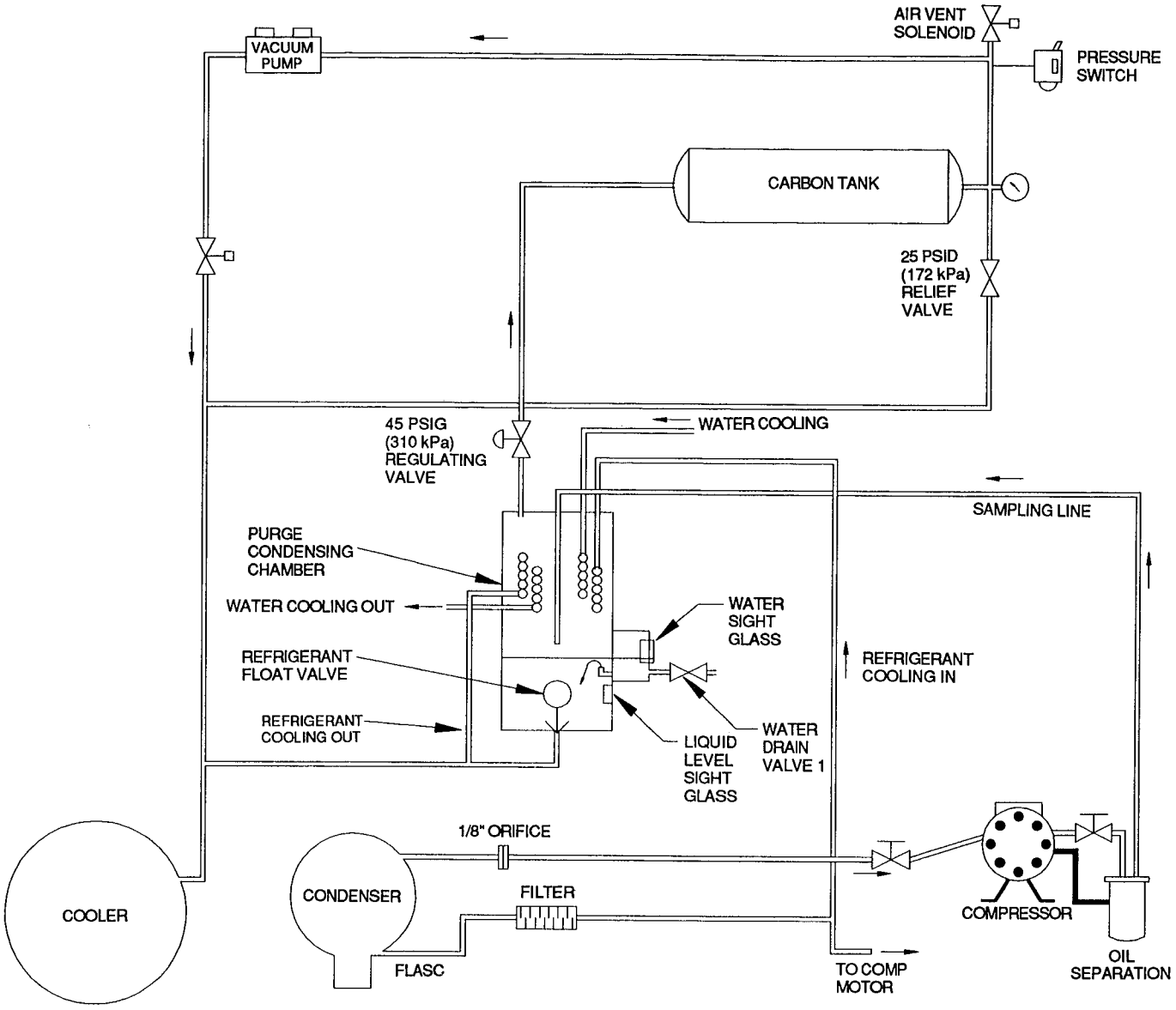
LEGEND

C	— Compressor Contactor	**SEP**	— Separator
CAP	— Capacitor	**TANK**	— Carbon Tank
CB	— Circuit Breaker	———	Factory Wiring
COMPR	— Compressor	- - - -	Field Wiring
CTR	— Counter	○(X)○	Coil
K	— Relay	○(X)○	Motor
KA	— Isolation Relay for Compressor A	●	Splice
KB	— Isolation Relay for Compressor B	[X]	Purge Control Box Terminal
LOC	— Loss of Cooling Switch	⊗	Chiller Control Panel Terminal, 115 Volts 50/60 Hz
M	— Motor		
POT	— Purge Pot		
PUMP	— Vacuum Pump		
S	— Solenoid		

NOTE: LINES

1. If any of the original wire furnished must be replaced, it must be replaced with an exact replacement wire or equivalent.
2. Number(s) indicates the line location of electrical components contactors, relays, pumps, switches, etc.

Typical piping



NOTE. Piping shown is for general point-of-connection only and is not intended to show details for a specific installation Certified wiring diagrams are available upon request

Guide specifications

High-Efficiency PreVent™ Purge

Carrier Model Number: **19DK**

Part 1 — General

1.01 SYSTEM DESCRIPTION

A The manufacturer shall provide and install a PreVent™ high efficiency purge unit when using a CFC or HCFC with an Ozone Depletion Potential of greater than 0 05.

B. The PreVent unit is designed for use with any low-pressure centrifugal chiller. The PreVent shall provide conservation of low pressure CFC and HCFC refrigerants and prevent their release into the atmosphere during chiller purging operation. Each discharge of the purge unit must not contain more than 5% refrigerant by weight. This efficiency must be maintained during purging when the chiller is running and when it is off. The unit must contain an activated carbon adsorption tank to achieve its high-efficiency level.

C. The PreVent unit, when installed with an approved condensing chamber, will have the ability to remove moisture from the chiller. The moisture removal will be accomplished without unit disassembly. The moisture will be removed through a valve by using system pressure.

1 02 QUALITY ASSURANCE

The equipment must be certified for safety and construction by ETL.

1 03 DELIVERY, STORAGE AND HANDLING

Unit shall be stored and handled in accordance with manufacturer's recommendations.

Part 2 — Products

2 01 EQUIPMENT

A. General:

1 The PreVent unit shall consist of a compressor, vacuum pump, oil separator, carbon tank and control panel. Additional components shall consist of safety devices, interconnecting copper piping and a heavy gage sheet metal cover

2 All Prevent units must be installed with a stainless steel condensing chamber or an equivalent design that has been tested for a 60 psig (414 kPa) operating pressure. The condensing chamber will have a sight glass to view moisture accumulation, a sight glass to view condensed refrigerant returning to the chiller's evaporator, a float valve that returns the refrigerant to the evaporator and a valve for removing moisture.

B. Compressor:

1 It shall be of the semi-hermetic reciprocating type ½ horsepower, 115 volts, 50/60 Hz, one phase with an operating pressure of 45 psig (310 kPa).

C. Vacuum Pump.

1. The pump shall be a diaphragm type with a ½ horsepower 120 volt, 50/60 Hz, one phase motor and shall be capable of pulling a 29 in. Hg (-98 kPa) vacuum (ref. 30 in. barometric pressure).

D. Carbon Tank.

1. The tank is to be made of 6 in. (.52 mm) schedule 80 PVC pipe. It will contain activated carbon for refrigerant adsorption. It will contain stainless steel screens and filters to prevent the carbon from leaving the tank.

E Safety Devices:

1. A pressure relief valve shall be installed on the carbon tank sized in accordance with ASHRAE 15-1989
2. Unit will utilize pressure and temperature switches to protect against over-pressurization and high temperature situations.

Carrier Corporation • Syracuse, New York 13221 7-92