THERMO KING CORPORATION	CREATED BY	W. BENSON	REVISION	I
	BASE UNIT	MAGNUM		O T
	REV. DATE	Nov 1st, 2007	PAGE 1 of 1	

PRODUCT SPECIFICATION

REFRIGERATION MACHINERY UNITS

MAGNUM®

FOR
REFRIGERATION CONTAINERS

Ingersoll-Rand.

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GENERAL UNIT INFORMATION

Manufacturer	Thermo King Corp.
Type of System	Picture frame, electric cooling and heating single piece condenser / evaporator unit.
Construction	The refrigeration machinery is of the picture frame type. The frame is constructed of aluminum, treated to resist corrosion induced by salt spray atmosphere. The evaporator door is a bolted type. The rear bulkhead panels are constructed of aluminum with a high inherent corrosion resistance. Between the evaporator and condenser section the unit is insulated with fire resistant (according to ISO 3582) and CFC-free polyurethane foam. The nominal density of the foam is 32 kg/m^3 (2 lbs/ft^3). Average thickness is 52 mm (2 inches). All aluminum material is 5000 or 6000 series.
Dimensions	Width 2 025.5 mm (79.75 in) Height 2 235.2 mm (88.00 in) Depth 420.0 mm (16.54 in) from back of the flange
Weight	397 kg (875 lbs)
Electrical System Design	Electrical system designed to comply with ISO 1496 Standard.
Designed to operate on	400 to 500 Vac 3 Ø 60 Hz ±2,5% 360 to 460 Vac 3 Ø 50 Hz ±2,5%
Control Circuit	29 Vac
Method of Heating	Electric resistance
Fresh Air Exchange Rate	Adjustable from 0 to 125 m^3/h, 150 m^3/h, 225 m^3/h, 285 m^3/h 60 Hz 0 to 104 m^3/h, 125 m^3/h, 187 m^3/h, 237 m^3/h 50 Hz
Unit Air Leakage	Less than 0.5 m^3/h at 76 mm WG (0.29 cfm at 3.0 in WG)
Unit Heat Leakage	Less than 3.4 kCal/h/°C (3.95 W/°C)
Paint Color (Powder or Liquid)	Off-white RAL 9016/85 (Unit) / Black (Tubing/Receiver Tank)
Aluminum Corrosion Protection (Unit White 'Powder' Paint)	The unit is pre-treated then painted with Infralit Polyester powder according to ISO test 7253 and 2409 classification 1. A Polyester Powder topcoat is then applied to a film thickness of 100 µ meters.
Refrigerant	R404A – 4.0 kg (8.8 lb)

The equipment is designed to withstand and operate satisfactorily under sea-going and environmental conditions as follows:	
Ocean Environment	Salt-laden air, sea spray, high humidity and severe atmospheric conditions.
Rolling	Amplitude of 30° on each side, periods of 13 seconds
Pitching	Amplitude of 6° periods of 8 seconds
Permanent List	10° on each side
Shock	Acceleration of 2g in all directions
Vibrations	Of the types encountered on ships, land vehicles and rails

DESIGN STANDARD INFORMATION

The machinery is designed for long distance transportation of deep frozen, frozen, chilled, or heated cargoes in a temperature range of -35°C (-31°F) to 30°C (86°F).
The machinery will be fully functional and work satisfactorily, in ambient temperatures from -30°C (-22 F) to 50°C (122°F). Components are specified to withstand temperatures up to 70°C (158°F).
The noise level of units fitted into the container will not exceed 80dB in 250 Hz band. Measurement taken in front of the unit 1.5 m (59 inch) distance and 1.2 m (47.3 inch) above ground with the unit operating at 50 Hz.
ARI - test method for rating refrigerated equipment.
Machinery complies with International Customs Regulations for Containers.
Machinery complies with relevant ISO recommendations.
Machinery complies with rules of B.V., ABS, and Lloyds.
Unit air leakage complies with Controlled Atmosphere requirements.
Refrigeration machinery complies with the requirements of the ATP regulations.
Unit complies with Australia and New Zealand Health Requirements.
Unit control system is prepared for power management (according to customer's requirements).
Unit complies with ATO (former Springer Institute) requirement regarding airflow.

UNIT CAPACITY REFRIGERANT R404a

Test method according to ARI standard no. 1110-69 approval Unit mounted in test room			
Net cooling capacity at 37.8°C (100°F) ambient temperature at 60 Hz power			
Evaporator Return Air Temperature	**Watts**	**KCal/hr**	**BTU/hr**
21°C (70°F)	15 822	13 608	54 000
2°C (35°F)	12 309	10 584	42 000
-18°C (0°F)	7 327	6 300	25 000
-29°C (-20°F)	5 070	4 360	17 300
-35°C (-31°F)	4 099	3 528	14 000
Net heating capacity (including fan heat) at 60 Hz power			
System heating capacity	5 800	4 984	19 800

TEMPERATURE CONTROL

CHILLED MODE

If the unit is started at a set temperature of -9.9°C (14.2°F) or above, the control will be from the supply air sensor. After approximately 40 seconds the evaporator fans will start running high speed and 10 seconds later the cooling or heating sequence will be initiated. Depending on the temperature difference between setpoint and supply air sensor, the program will initiate the compressor or the heater elements according to the temperature requirements.

The cooling capacity is managed by means of PID modulated valve control. Pulsing the heaters in cycles of 30 seconds controls the heating capacity.

FROZEN MODE

With the temperature setpoint at -10°C (14°F) or below the unit will function from the return air sensor. If the return air temperature decrease 1°C (1.8°F) below setpoint, the compressor stops until the temperature has risen to 1°C (1.8°F) above setpoint. The evaporator fans run continuously in low speed except during defrost.
ON - OFF cycling of the compressor is minimum 6 minutes on and minimum 6 minutes off. Both, heating and modulation control are locked in frozen mode.

DEFROST

Demand

The defrost initiation is controlled by the defrost sensor, located in the evaporator coil. This sensor will activate the demand cycle when the temperature difference between return air sensor and defrost sensor increases to a pre-set value. A probe status entry is made in the event log to note a demand cycle vs. a timed cycle.

For additional security, defrost will also be initiated on a timed basis.

Timed

Chilled mode

When starting the unit with supply air temperature at 5°C (41°F) or below, the initial defrost timer interval is two hours and increases by 30 minutes up to 6-hour intervals on time activated defrosts.
When starting the unit with supply air temperature at 5.1°C (41.2°F) or above, the defrost timer interval is eight hours.

Frozen mode

When starting the unit in frozen mode (below -10°C / 14°F), the initial defrost timer interval will be eight *compressor* hours and increases by two hours up to a twenty-four hour interval on time activated defrosts.
If the unit has been switched off for more than twelve hours or if the setpoint has been changed more than 5°C (9°F), the timer will be reset. If not, the unit will start with the same defrost sequence set by the above rules.

Termination

The defrost sensor terminates the defrost cycle automatically when the temperature in the evaporator coil rises to:

- **18 C or higher than 8°C (46.4°F) in 35 minutes in frozen and chilled mode**

DETAIL INFORMATION ON UNIT

COMPRESSOR

Manufacturer	Copeland	**Type**	ZMD18KVE-TFD-277
Protection	Internal thermal automatic reset	**Nominal HP**	6
Locked Rotor Current	70 A @460 V / 60 Hz	**Finish**	**Pre-treatment:** Grit blast, NACE No. 1/SSPC-SP5 **Finish:** Listed in application order: 1. Thermally sprayed aluminum, minimum thickness of 254 µm (0 .010 in) 2. Sealer per MIL STD TT-P-28, dry film thickness of 15.2 – 25.4 µm (0.0006 – 0.001 in)
Displacement	20.6 m^3/h (726 cfh) @ 60 Hz	**Weight**	43 kg / 95 lb

EVAPORATOR COIL

Tube Material	Copper	**Fin Material**	Special Aluminum DIN 1712/A199
Fin Space	3.17 mm	**Configuration**	Horizontal
Pipe Copper	According to DIN 1787 wall thickness 0.45 mm	**Protection**	Fin material pre-coated with hydrophilic coating. Coating also provides additional corrosion protection.
Surface Area	**54.6 m^2 (588 ft^2)**	**Circuits**	16

CONDENSER COIL (AIR COOLED)

Tube Material	Copper	**Fin Material**	Copper
Fin Space	2.00 mm	**Configuration**	Circular
Pipe Copper	According to DIN 1787 wall thickness 0.45 mm	**Protection**	Epoxy E-Coat with Polyurethane topcoat for UV protection. Coating also provides additional corrosion protection.
Surface Area	33.4 m^2 (360 ft^2)		

EVAPORATOR FAN

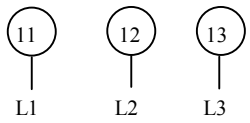
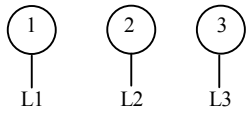
Type	Propeller	**Diameter**	355 mm (14 in)
Number of Fans	2	**High Speed** **Low Speed**	3 450 rpm at 60 Hz 1 725 rpm at 60 Hz
Blade Material	Glass reinforced polypropylene	**Drive**	Direct on motor shaft
Hubs Material	Glass reinforced polypropylene with stainless steel ring	**Number of Blades**	8

Air Flows	see graph	**Pitch**	25°

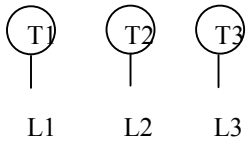
CONDENSER FAN

Type	Propeller	**Diameter**	550 mm (22 in)
Number of Fans	1	**Speed**	1 750 rpm at 60 Hz
Blade Material	Glass reinforced polyamide	**Drive**	Direct on motor shaft
Air Flow	6 000 m^3/h 3 531 CFM	**Number of Blades**	8
Hubs Material	Glass reinforced PBT, and stainless steel ring	**Pitch**	30°

EVAPORATOR FAN MOTORS

Nominal KW	0.75 kW 1.0 – 0.25 hp (60 Hz) 0.83 – 0.20 hp (50 Hz) 3 Phase	**Type**	Completely enclosed with separate windings for high speed, low speed, and non-ventilated
Speed	3 450 - 1 725 rpm (60Hz) 2 875 - 1 440 rpm (50Hz)	**Protection**	Internal thermal automatic reset (each winding)
Shaft Material	303 Stainless steel	**Bearing**	Ball – double sealed full contact seals (Grease - Mobil 28)
Finish	Iron phosphate pre-treatment, cathodic epoxy e-coat prime coat, black epoxy top coat	**Lead Connections**	High Speed  Low Speed 
No. of Motors	2	**IP**	56

CONDENSER FAN MOTOR

Nominal kW	0.55 kW 0.75 hp (60 Hz) 0.63 hp (50 Hz)	**Type**	Completely enclosed non-ventilated
Speed	1 725 rpm (60 Hz) 1 425 rpm (50 Hz)	**Bearing**	Ball – double sealed full contact seals (Grease – Mobil 28)
Shaft Material	303 Stainless steel	**Protection**	Internal thermal auto. reset
No. of Motors	1	**IP**	56
Finish	Iron phosphate pre-treatment, cathodic epoxy e-coat prime coat, black epoxy top coat	**Lead Connections**	

DEFROST / HEATERS

Defrost drain pan with high edges, 2 drains and plastic hose. Drain complies with TIR requirements.
Drains are located in close proximity to condenser coil and compressor to prevent icing in cold ambient.

Defrost Heater	680 W each @ 265 V/60 Hz	**No. of Defrost Heaters**	6

ELECTRICAL SAFETY CONTROLS

Compressor Motor **Condenser Motor** **Evaporator Motor**	Internal thermal automatic reset		
Main Circuit Breaker	25 A		

CONTROL VALVES

Valve	Voltage	Normal Position	Function
Digital Control Valve	24 Vac	Closed	Controls the compressor loading
Economizer Valve	24 Vac	Closed	Turns the economizer cycle on and off

REFRIGERATION SAFETY CONTROLS

Low Pressure Switch	Cut-out: -.2 to -.4 bar (5" to11" hg) Cut-in: .3 to .5 bar (4 to 7 psig)	**Fusible Plug (Receiver)**	Relief Temperature 100°C (212°F)
High Pressure Switch	Cut-out: 32.4 bar (470 psig ±7 psig) Cut-in: 30.1 bar (375 psig ±38 psig)		

ELECTRICAL PANEL COMPONENTS

Contactors	Compressor CI25	**Main Circuit Breaker**	25A
Relays	Condenser Fan, Heater, Evaporator Fan (2 pcs.) and Phase Selection (2 pcs.)	**Fuse**	3 x 20 A on Main Relay Board 1 x 7.5 A on control circuit
Transformer	Primary 500 Vac Secondary 29/28/40 Vac	**Phase Sensor**	Automatic selection
Switch	Unit "ON / OFF"	**Battery Backup**	12 Volt service free 1.9 A Capacity

POWER PLUG

Type CEE 17 (ISO 1496-2, Annex 0 0,1)	4 pole 400 / 460 Volt 50/60 Hz	**Amps**	32	Earth	3h pos.

POWER CABLE

Storage for power cable provided in condenser section

Length	18.3 m (60 ft)	**Cable**	4 x 4 mm^2, 450/750 V QWPK (11ga/4 conductor)
Temperature Range	-37° C (-35° F) to 90° C (194°F)	**Color**	Yellow

DATALOGGER DOWNLOAD PLUG

Location	One on the electrical box and one on back side of container unit.	**Type**	Deutsch HD10-5-16-P

USDA RECEPTACLE

Receptacle type 3 pole	Deutsch HD10-3 96 (Male)	**Quantity**	4 pcs.
Sensor connection type	NTC	**Location**	Rear left side

DEHUMIDITY CONTROL

Humidity reduction is accomplished by re-heating the evaporator air with the defrost heaters. A control algorithm allows humidity setpoints between 60 and 95%. Condensate is drained to the outside via the defrost drain tubing.

Option includes; humidity sensor installed in return air and all required wiring and control software.

HUMIDITY SENSOR

Operational Range	60% - 95% rH	**Accuracy**	at 60% to 75%: ±1.5% at 75% to 95%: ±3.0%
Output Signal	4 mA - 20 mA	**Output per 1% rH**	0.20 mA

MISCELLANEOUS

Auto PTI Includes function tests and fault diagnostics
Dual speed, double winding evaporator motors
One piece removable evaporator access
Solid State Microprocessor Controller with Backlit LCD digital display, 28 mm (1.1 inch)
Sequential component start to minimize peak amp draw
Unique fresh air change system integral ducting for wall to wall air distribution
Safety harness hooks and grab-handle
Large diameter, low speed condenser fan for quiet operation
Power saving “on demand” automatic defrost system
Tin-plated and numbered wires according to UL1647
Lightweight composite condenser and evaporator fans.
Manual operated control by-pass mode
Economy mode can be selected in both chilled and frozen range
Suction and Discharge Service Valves
Refrigerant service connections per SAE J639 (R134a automotive type) located on suction and discharge side of the compressor

MICROPROCESSOR CONTROLLER MP-3000A

The MP-3000A is an advanced microprocessor temperature controller based on the latest computer technology and is developed especially for reefer control and monitoring. The controller is designed with an integrated datalogger with a link to an optional power line communications module.

Frequently used functions such as Temperature Setpoint and Defrost have been given separate hot keys for ease of operation.

Vital data are/can be shown on an LED-display with 20.32 mm high characters, ensuring easy viewing even from a long distance. The controller is equipped with the following parts:

- 1 4 line by 20 character LCD display
- 1 5 segment LED display
- 8 LED's
- 1 16 key general-purpose keyboard plus 4 hot keys

The control system consists of the following:

MP-3000A Microprocessor Controller w/ Integrated Data logger
Main Relay Board (PCB)
Temperature Sensors (7)

With exception of the sensors, all components are mounted in the control box. The design of the microprocessor provides permanent accuracy, reliability, and expandability.
In the case of a control sensor failure, another sensor will take over and automatically compensate for the difference between supply and return air temperatures.
A permanently stored base program is built into the controller and a non-volatile memory for additions or changes in software is present.
Both heating and modulation modes are locked out in frozen mode (Setpoints of -10° C or less).
Overall accuracy is ±0.25° C (±0.4° F) and verification of temperatures should be done using an instrument with equal or better performance.

LCD DISPLAY

The LCD display is used for all purposes of the operator / unit interface showing menu information, data fields, etc.

LED DISPLAY

The main purpose of the LED display is to show the sensor currently used in the control algorithm. This temperature will either be return or supply. The LED displays the controlling sensor. If a temperature is out of range the display will show "Err". A +/- sign will indicate if the out of range value is positive or negative. The first 10 seconds after power up, the LED display will show the current setpoint. The setpoint will also be shown for 5 seconds in the LED display after a new setpoint has been accepted.
Additionally, the LED display is used during PTI to show the current stage of the PTI.

LED DEFINITION

The use of the LED's is defined as follows: (reading right to left)

1	Red	FLASHING if error
2	Green	ON if temperature is in range
3	Yellow	ON if defrost is active
4	Yellow	ON if heaters are activated
5	Yellow	ON if compressor is running
6	Yellow	ON if humidity control is selected
7	Yellow	ON if supply air temperature is displayed
8	Yellow	ON if return air temperature is displayed

If LED 7 and LED 8 (return and supply) are ON at the same time, the Setpoint is shown in the LED display.
The Setpoint can be set from -35° C (-31° F) to 30° C (86° F).
At Setpoints below -10° C (14° F) the controlling sensor is return air. Heat and capacity reduction will be locked out and evaporator fan motors will be operating on low speed.
At Setpoints above –9.9° C (14.2° F), the controlling sensor is supply air. The evaporator fan motors will be operating on high speed.

DATALOGGER

The integrated datalogger is a microprocessor-based recorder specifically developed for refrigerated containers. The datalogger contains a memory area for storing temperatures.

All registrations are stored in the flash memory, which contains temperatures logged at user selectable intervals of ½, 1, 2 or 4 hours. The sensors logged are: supply air, return air, USDA, ambient and the Setpoint. Using a one-hour logging interval, temperature information covering the last 625 days is available. The logging of the USDA sensors are fixed at a one-hour interval automatically to comply with the USDA regulations.
One-minute log is only for calibration of USDA sensors. Maximum 72 minutes, self-terminating.

All logs are stored at time and date of occurrence. The Real Time Clock in the controller is set at UTC time at the factory and is backed up by a built-in extended life Lithium battery. The datalogger is equipped with high-speed serial communications port. The logs can be inspected on the LCD display of the controller.

Retrieving the datalogger can either be done by use of York Controls Logman handheld data retriever equipment, Thermo King Smart Sponge or via the REFCON / GRASP power line remote monitoring system. Retrieving by the REFCON / GRASP system requires that the controllers are equipped with ISO standard 10 368 high data rate, wide band, and power cable communication modems.
The datalogger will continue to log, 120 entries (at 1 hour interval) after the container has been turned OFF or disconnected from mains power source.

Ambient Temperature	-25° C to +70° C	**Humidity**	95% rh non-condensing
Temperature Accuracy	±0.15 °C	**Capacity**	15 000 Logs equal to 625 days continuous logging of all sensors

RETRIEVABLE DATA

The controller contains three memory areas for data: 1. Events / Alarms, 2. Auto PTI, 3. Comments, 4. Temperature log

1. Event and Alarms:
   This record contains the last 1 024 events, such as information on alarms, power on/off, defrost start/end, etc.

2. Auto PTI
   Records of the last two Auto PTI's performed.

3. Comments:
   Entering using the keyboard on the controller, sending by the Logman handheld data retriever, or by the Thermo King Smart Sponge, comments can be entered to the controller memory.

4. Temperature log
   See datalogger.

All logs are stored at time and date of occurrence. The Real Time Clock in the controller is set at UTC time at the factory and is backed up by a built-in extended life Lithium battery. The datalogger is equipped with high-speed serial communications port. The logs can be inspected on the LCD display of the controller.

FUNCTION AND PTI TEST

There are three test modes programmed in the microprocessor.

Test Mode 1
Function test. Automatically tests individual components including the controller display, sensors, condenser fan, evaporator fans and compressor. The test includes measurement of component power consumption and compares results to expected values.

Test Mode 2
Auto PTI. Automatically checks unit refrigeration capacity, heating capacity, temperature control, and individual components including controller display, contactors, fans, protection devices and sensors. The test includes measurement of component power consumption and compares results to expected values. This test mode generates a PTI log file.

Test Mode 3
Manual Function test. Allows a technician to perform specific diagnostic tests on individual components or turn several components ON at the same time to perform a system test.

CONTROL ALARMS

Three types of alarms may occur.

1. Shutdown Alarm (Level 1): The alarm LED flashes and the unit stops. A shutdown alarm indicates that the unit has stopped to prevent damage to the unit or cargo. The condition must be corrected before the unit will restart.
2. Check Alarm (Level2): The alarm LED flashes until the alarm is acknowledged but the unit continues to operate. A check alarm indicates corrective action should be taken.
3. Log Alarm (Level 3): The alarm is recorded in the data logger only; the alarm LED does not flash.

Sensor Alarms:

- If any sensor is defective (evaporator coil, return air, supply air, condenser coil, ambient air, or compressor discharge temperature).
- If the temperature difference between the evaporator coil, return air, or supply air sensors get either too high or too low in accordance with actual conditions.
- If the temperature difference between the two-supply air sensors is too high.

Temperature Alarm Chilling:

If temperature is not in range of ±1.5° C (±2.7° F) of the Setpoint within one hour of running, at settings of –9,9° C (14,2° F) or higher. This in-range temperature tolerance is user selectable. The alarm is ignored if the temperature is falling / rising towards the Setpoint greater than 0.1° C (0.2 F) per hour when the temperature is within 5° C (9° F) of the Setpoint. This applies to bothb cooling and heating.

Temperature Alarm Freezing:

If temperature is not in range of ±1.5° C (±2.7° F) of the Setpoint within one hour of running, at settings of –10° C (14° F) or below. This in-range temperature tolerance is user selectable. The alarm is ignored if the temperature is falling / rising towards the Setpoint greater than 0.1° C (0.2 F) per hour when the temperature is within 5° C (9° F) of the Setpoint.

Defrost Alarm:

If defrost interval lasts more than 90 minutes or if return air temperature is > 38° C (100° F) at 60Hz operation or 120 minutes at 50 Hz operation.

Compressor Discharge Temperature: > 130° C (266° F).

Phase Sensing: If after 20 seconds, the controller is not able to decide the correct phase direction.

Pressure: If the discharge or suction pressure exceeds programmed limits.

Power: If the voltage, frequency, or total unit current exceeds programmed limits.

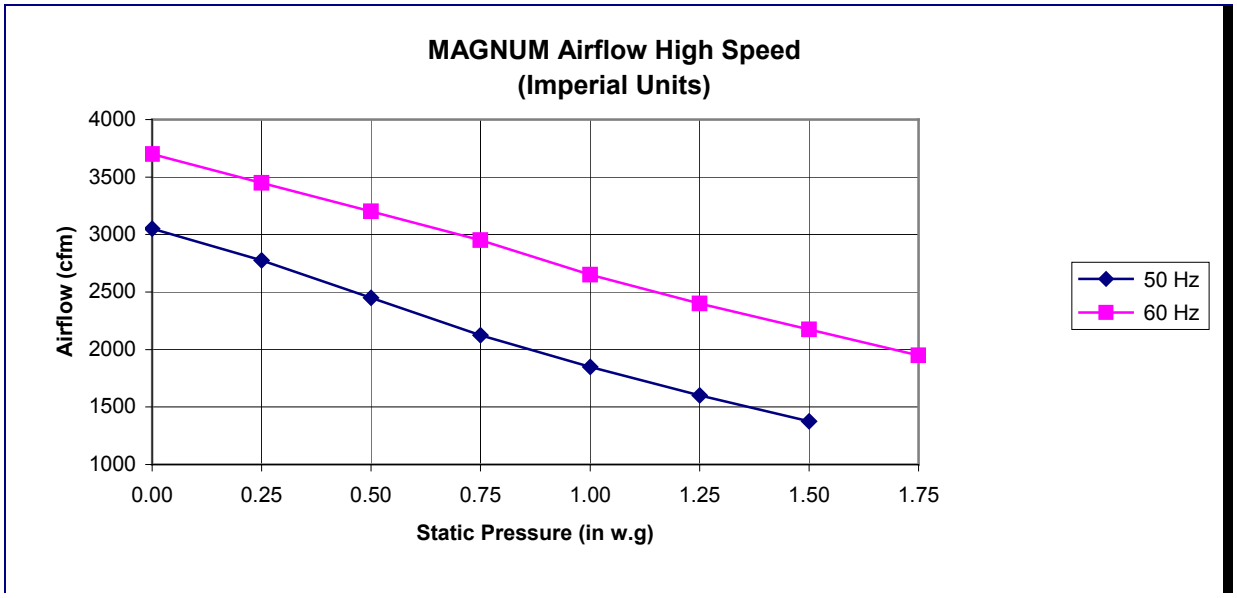
TEMPERATURE SENSORS

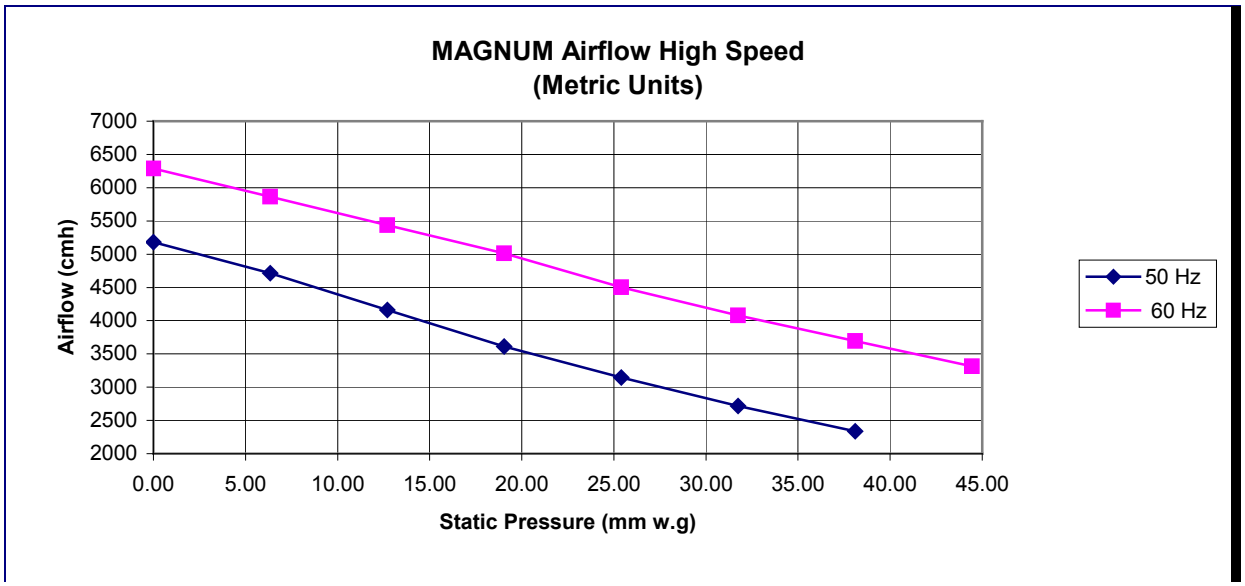
The sensors (7) are of a thermistor design. They are linked to the controller via a two-conductor cable.

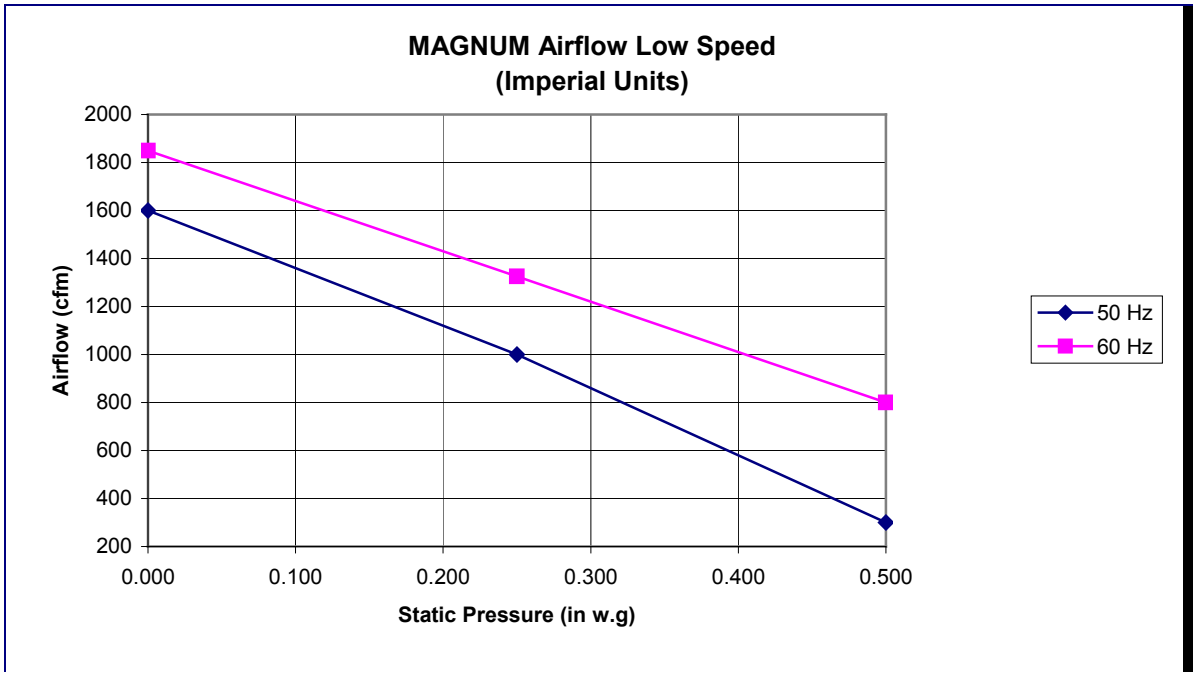
1. Evaporator Coil - Located in the center of the evaporator coil
2. Return Air - Located in the return air section
3. Supply Air 1 - Located in the supply air section
4. Supply Air 2 - Located in the supply air section
5. Condenser Coil - Located in the condenser coil
6. Ambient Air – Located on the unit front wall
7. Compressor – Located in the compressor head

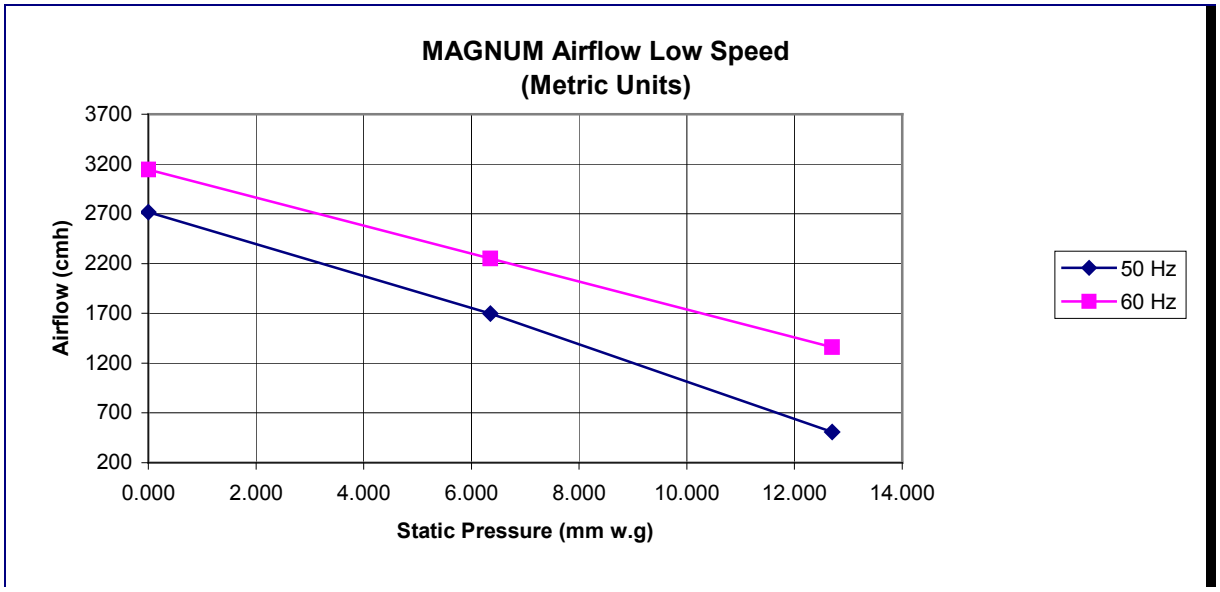
GRAPHS, DRAWINGS AND DIAGRAMS

AIR FLOW MAGNUM

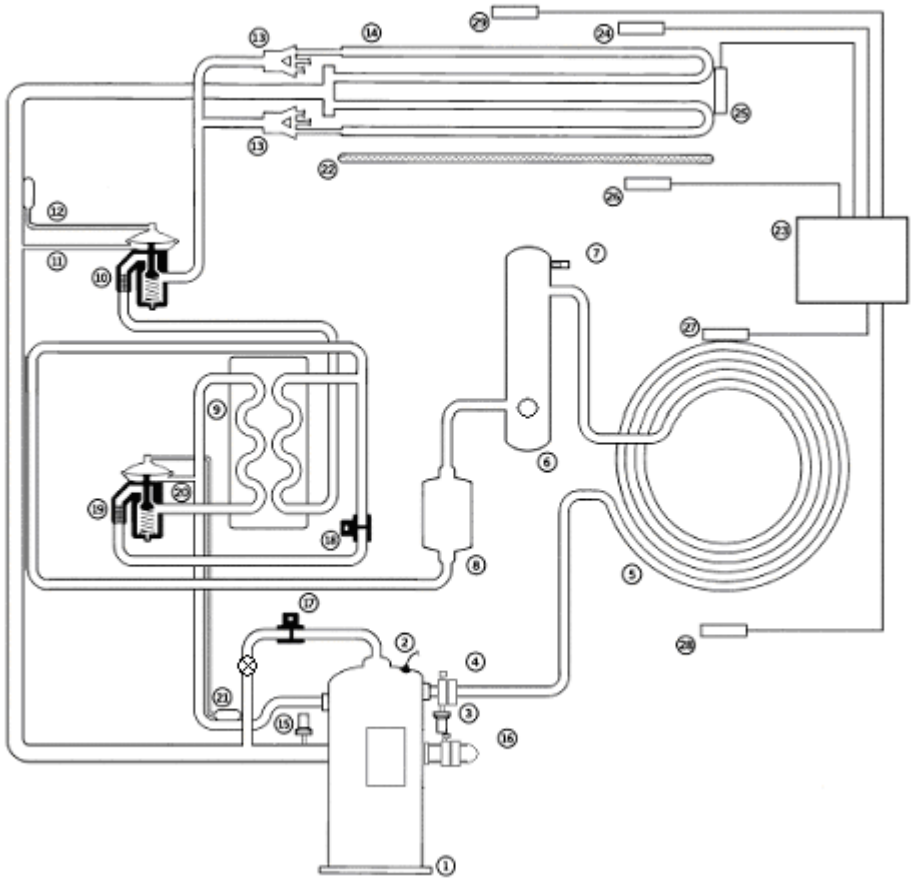






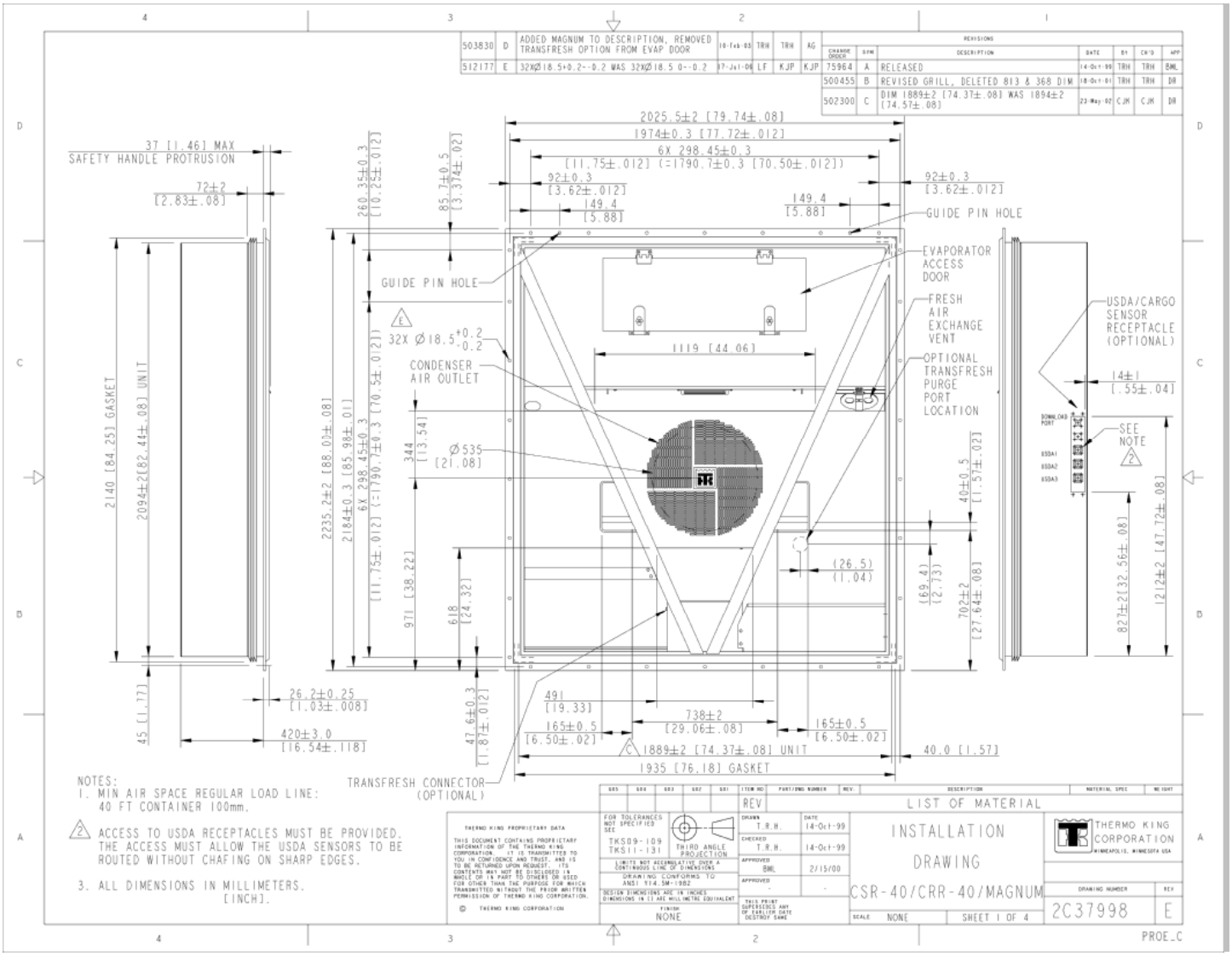


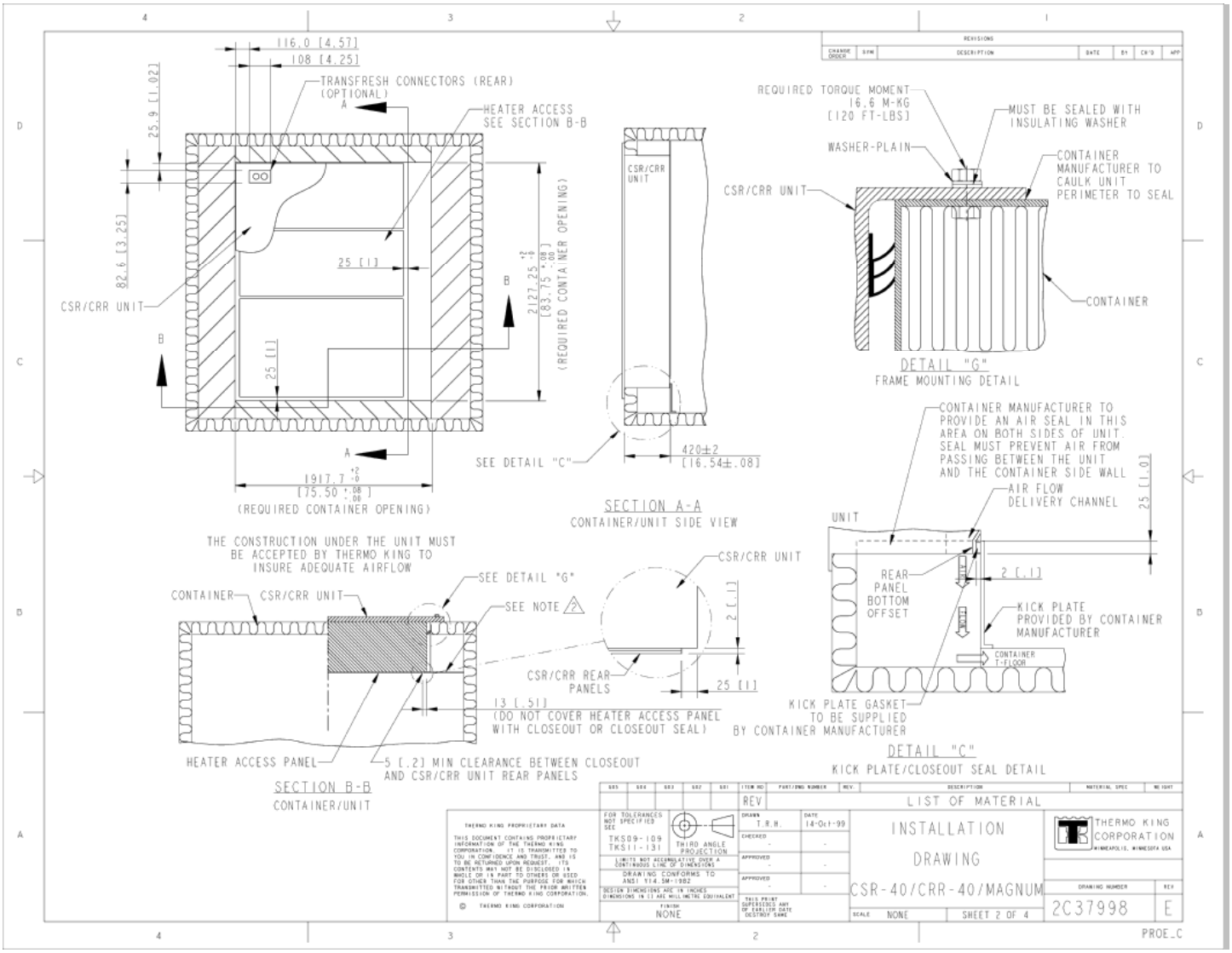
PIPING DIAGRAM

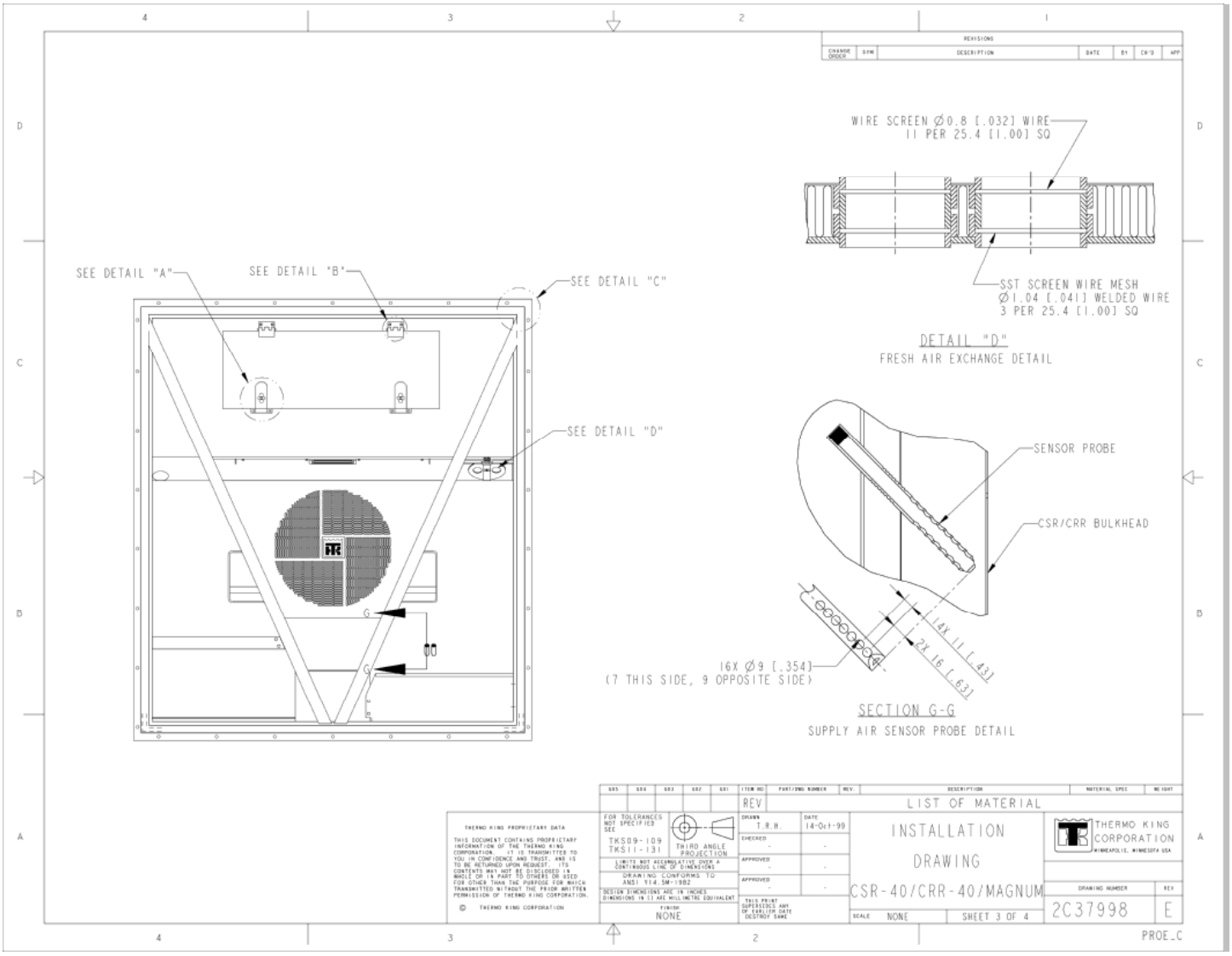


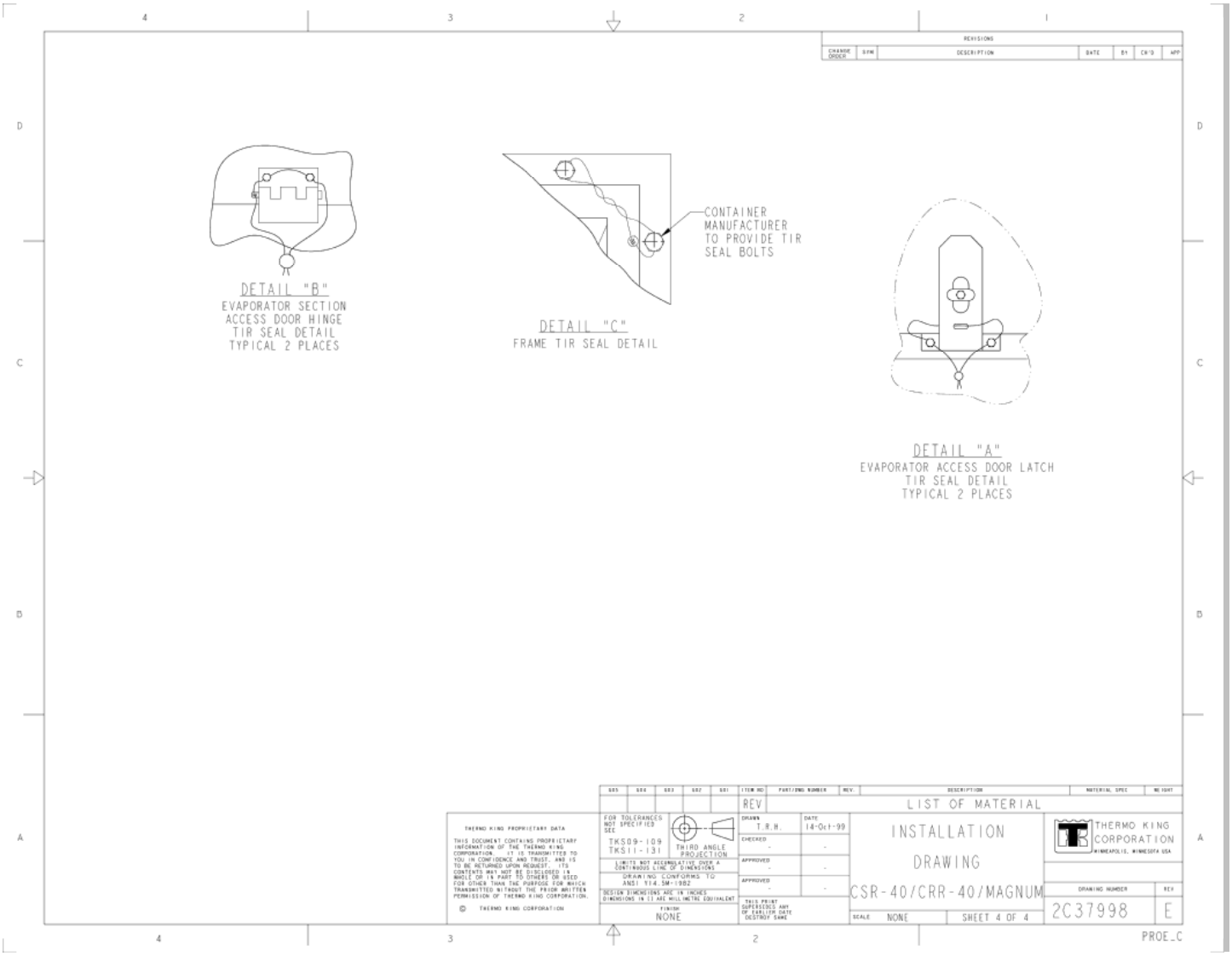
1. Scroll Compressor
2. Discharge Temperature Sensor
3. High Pressure Cut-Out HPCO
4. Discharge Service Port
5. Condenser Coil
6. Receiver Tank
7. Fusible Plug
8. Filter Drier
9. Economizer Heat Exchanger
10. Expansion Valve
11. TXV Equalizer Line
12. TXV Feeler Bulb
13. Evaporator Distributors
14. Evaporator Coil
15. Low Pressure Cut-Out LPCO
16. Suction Service Port
17. Digital Control Valve with Service Valve
18. Economizer Valve
19. Economizer TXV
20. Economizer TXV Equalizer Line
21. Economizer TXV Feeler Bulb
22. Electric Heaters
23. MP3000 Microprocessor
24. Return Air Sensor
25. Evaporator Coil Sensor
26. Supply Air Sensor
27. Condenser Coil Sensor
28. Ambient Air Sensor
29. Humidity Sensor

INSTALLATION DIAGRAMS




116.0 [4.57]
108 [4.25]
TRANSFRESH CONNECTORS (REAR) (OPTIONAL)
HEATER ACCESS SEE SECTION B-B
25.9 [1.02]
82.6 [3.25]
CSR/CRR UNIT
25 [1]
2127.25 +2 -0 [83.75 +.08 -.00] (REQUIRED CONTAINER OPENING)
1917.7 +2 -0 [75.50 +.08 -.00] (REQUIRED CONTAINER OPENING)
SEE DETAIL "C"
420±2 [16.54±.08]
SECTION A-A
CONTAINER/UNIT SIDE VIEW
REQUIRED TORQUE MOMENT 16.6 M-KG [120 FT-LBS]
MUST BE SEALED WITH INSULATING WASHER
WASHER-PLAIN
CONTAINER MANUFACTURER TO CAULK UNIT PERIMETER TO SEAL
CONTAINER
DETAIL "G"
FRAME MOUNTING DETAIL
CONTAINER MANUFACTURER TO PROVIDE AN AIR SEAL IN THIS AREA ON BOTH SIDES OF UNIT. SEAL MUST PREVENT AIR FROM PASSING BETWEEN THE UNIT AND THE CONTAINER SIDE WALL
AIR FLOW DELIVERY CHANNEL
25 [1.0]
UNIT
REAR PANEL BOTTOM OFFSET
2 [.1]
KICK PLATE PROVIDED BY CONTAINER MANUFACTURER
CONTAINER T-FLOOR
KICK PLATE GASKET TO BE SUPPLIED BY CONTAINER MANUFACTURER
DETAIL "C"
KICK PLATE/CLOSEOUT SEAL DETAIL
THE CONSTRUCTION UNDER THE UNIT MUST BE ACCEPTED BY THERMO KING TO INSURE ADEQUATE AIRFLOW
CONTAINER
CSR/CRR UNIT
SEE DETAIL "G"
SEE NOTE 2
CSR/CRR REAR PANELS
13 [.5] (DO NOT COVER HEATER ACCESS PANEL WITH CLOSEOUT OR CLOSEOUT SEAL)
HEATER ACCESS PANEL
5 [.2] MIN CLEARANCE BETWEEN CLOSEOUT AND CSR/CRR UNIT REAR PANELS
SECTION B-B
CONTAINER/UNIT
REVISIONS
LIST OF MATERIAL
INSTALLATION DRAWING
CSR-40/CRR-40/MAGNUM
THERMO KING CORPORATION
MINNEAPOLIS, MINNESOTA USA
DRAWING NUMBER 2C37998
REV E
SCALE NONE
SHEET 2 OF 4
THERMO KING PROPRIETARY DATA
© THERMO KING CORPORATION
PROE_C


WIRE SCREEN Ø0.8 [.032] WIRE
11 PER 25.4 [1.00] SQ
SST SCREEN WIRE MESH
Ø1.04 [.041] WELDED WIRE
3 PER 25.4 [1.00] SQ
DETAIL "D"
FRESH AIR EXCHANGE DETAIL
SEE DETAIL "A"
SEE DETAIL "B"
SEE DETAIL "C"
SEE DETAIL "D"
SENSOR PROBE
CSR/CRR BULKHEAD
16X Ø9 [.354]
(7 THIS SIDE, 9 OPPOSITE SIDE)
14X 11 [.43]
2X 16 [.63]
SECTION G-G
SUPPLY AIR SENSOR PROBE DETAIL
LIST OF MATERIAL
INSTALLATION
DRAWING
CSR-40/CRR-40/MAGNUM
THERMO KING CORPORATION
MINNEAPOLIS, MINNESOTA USA
2C37998
E
SHEET 3 OF 4
PROE_C


DETAIL "B"
EVAPORATOR SECTION
ACCESS DOOR HINGE
TIR SEAL DETAIL
TYPICAL 2 PLACES
CONTAINER MANUFACTURER TO PROVIDE TIR SEAL BOLTS
DETAIL "C"
FRAME TIR SEAL DETAIL
DETAIL "A"
EVAPORATOR ACCESS DOOR LATCH
TIR SEAL DETAIL
TYPICAL 2 PLACES
REVISIONS
LIST OF MATERIAL
INSTALLATION
DRAWING
CSR-40/CRR-40/MAGNUM
THERMO KING CORPORATION
MINNEAPOLIS, MINNESOTA USA
2C37998
SHEET 4 OF 4
PROE_C

REVISIONS

a	May 10, 2002	Preliminary Release
A	Sept 10, 2002	Production Release
B	Oct 04, 2002	Updated Defrost Section and Minor Corrections
C	Oct 22,2002	Updated Refrigerant Charge and pg. 12 setpoint range
D	Nov 22, 2002	Corrected coil surface areas
E	Jan 28, 2003	Added Digital service valve. Updated control valve chart
F	Feb 20, 2003	Updated installation drawings and evap fan material. Updated location of compressor temperature sensor.
G	Mar 02, 2005	Changed USDA from Cannon PT100 to Deutsch NTC
H	Mar 01, 2006	Removed heater klixon Adjusted termination on defrost Reset able fuses instead of the traditional fuse/fuse holders on 2 x 2 A on MP3000
I	Nov 01, 2007	MP3000 updated to MP3000A, Installation drawing Updated, Retrievable data updated,