



Desiccant Dehumidification Equipment

Submittal

Pacific Coliseum

Munters Job Number 807938, -1, -2, -3  
DH-1, DH-2, DH-3, DH-4  
Purchase Order #11553  
Model Number - A40G

Rev 00

Reviewed MM  
Date 5-10-07

**Contacts:**

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Munters Sales Representative  
Art Doramajian @ 514-920-0021

Factory Project Coordinator  
Mike Nelson @ 210-249-3847

Munters Service / Start-up Scheduling  
800-229-8557

Munters Corporation  
Commercial Dehumidification Division  
16900 Jordan  
Selma, TX 78154  
(210) 651-5018



# Munters

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PACIFIC COLISEUM

MUNTERS JOB NUMBER 807938, -1, -2, -3

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## Unit Supplied Equipment

Munters factory tests each of its units and ensures proper operation, performance, and quality required by the National Electric Code, the Uniform Plumbing Code, the Standard for Heating and Cooling Equipment, the Standard for Commercial Industrial Gas Heating Equipment and the standards directed by ETL Testing Laboratories Inc.

### **100 VESTIBULE ARRANGEMENT**

131 Modulating Fresh Air Damper - Controlled by Others

132 Modulating Return Air Damper - Controlled by Others

### **200 CASSETTE EQUIPMENT**

207 Minihelic Pressure Gauges for Reactivation and Process Airstreams

240 86" x 400mm Titanium Silica Gel HoneyCombe Wheel

### **300 REACTIVATION EQUIPMENT**

302 Factory Balanced Backward Airfoil Direct Drive Plug Fan With Premium Efficiency TEFC Motor

305 Direct Fire Burner W/Automatic Ignition, Modulating Gas Valve, Gas Regulator, and Temperature Controls

309 Reactivation Gas Pipe Stubout Through Right Hand Side Of Unit

327 Duct Connections for Indoor Installation

\* Rubber Isolators

### **500 COIL AND CONDENSING UNIT EQUIPMENT**

517 Chilled Water Coil ARI Certified

### **600 SUPPLY FAN EQUIPMENT**

610 Adjustable Motor Platform

613 Backward Airfoil Belt Drive W/Premium Efficiency TEFC Motor, Factory Balanced Fan

617 Isolation Spring Mounting

\* Seismic Restraints

### **900 UNIT STRUCTURE**

901 Hinged Service Doors for Compartment Access

904 Lifting Lugs in Base of Unit and Instructions for Rigging of Equipment

907 Louvered Outside Panels for Air Ventilation

921 Galvalume Exterior Double Wall Panels With 2" of Foam Insulation

922 Galvalume Roof Panels W/Capped Joints and 2" of Foam Insulation

### **1000 CONTROL CABINET EQUIPMENT**

1007 Humidistat(s)

1018 Filter Monitor Gauge(s)

1052 Terminal Strip for Remote Controller (Inputs / Outputs)

### **1100 SPECIAL FEATURES**

1119 Internal Vestibule Maintenance Lighting

### **1200 UNINSTALLED ITEMS**

1201 Spare Filters

EQUIPMENT DATA SHEET	
MANUFACTURER	MUNTERS DH
MODEL NUMBER	A40G
<b>DESIGN DATA</b>	
OUTSIDE AMBIENT (DB / GR-LB)	52 / 57
SUPPLY AIRFLOW (SCFM)	20,000
MAKE UP AIR VOLUME (SCFM)	0 - 20,000
<b>SUPPLY FAN</b>	
SIZE	33" SWSI
TYPE/CLASS	BAF / II
AIR VOLUME (SCFM)	20,000
TOTAL STATIC PRESSURE (WG")	4.95
EXTERNAL STATIC PRESSURE (WG")	1.50
FAN RPM	1496
FAN BHP	23.4
MOTOR HP	30
<b>REACTIVATION FAN</b>	
SIZE	18"x90%
TYPE/CLASS	BAF / II
AIR VOLUME (SCFM)	6,050
TOTAL STATIC PRESSURE (WG")	5.78
EXTERNAL STATIC PRESSURE (WG")	1.00
FAN RPM	3450
MOTOR HP	15
<b>REACTIVATION HEATER</b>	
TYPE OF GAS	NATURAL
CAPACITY INPUT	1,500,000 MAX BTUH
STAGES OF CAPACITY	MODULATING
GAS SUPPLY PRESSURE REQUIRED	6-15" WG
GAS PRESSURE AT PILOT	3.5" WG
PRESSURE DROP ACROSS BURNER	1.5" WG
<b>86" x 400mm DESICCANT WHEEL</b>	
MOISTURE REMOVAL (LB / HR)	642
WATER REMOVAL EFFICIENCY (BTU/LB)	2,440
HEAT TRANSFER EFFICIENCY (BTU/LB)	1,581
PRESSURE DROP PROCESS (WG")	1.96
PRESSURE DROP REACTIVATION (WG")	2.52
<b>POST COOLING COIL</b>	
FLUID TYPE	WATER
TOTAL CAPACITY (BTUH)	1,038,000
SENSIBLE CAPACITY (MBH)	1,038,000
NUMBER OF COILS	1
ROWS / FPI	8 / 10
FACE AREA (SQ. FT.)	44.4
ENTERING AIR (DB / GR-LB)	99 / 7
LEAVING AIR (DB / GR-LB)	51 / 7
TOTAL CONDITIONED AIR (SCFM)	20,000
COIL AIR PRESSURE DROP ("WG)	0.60
FLUID ENTERING / LEAVING TEMP	45 / 55
PIPE CONNECTION SIZE (IN)	3
COIL WEIGHT-DRY (LBS)	1,018.0
COIL WEIGHT-WET (LBS)	1,463.0
FLUID PD (FT-H2O)	10.03
GPM	207
COIL CV	99

FILE: Pacific Coliseum A40G 807938 Rev 00

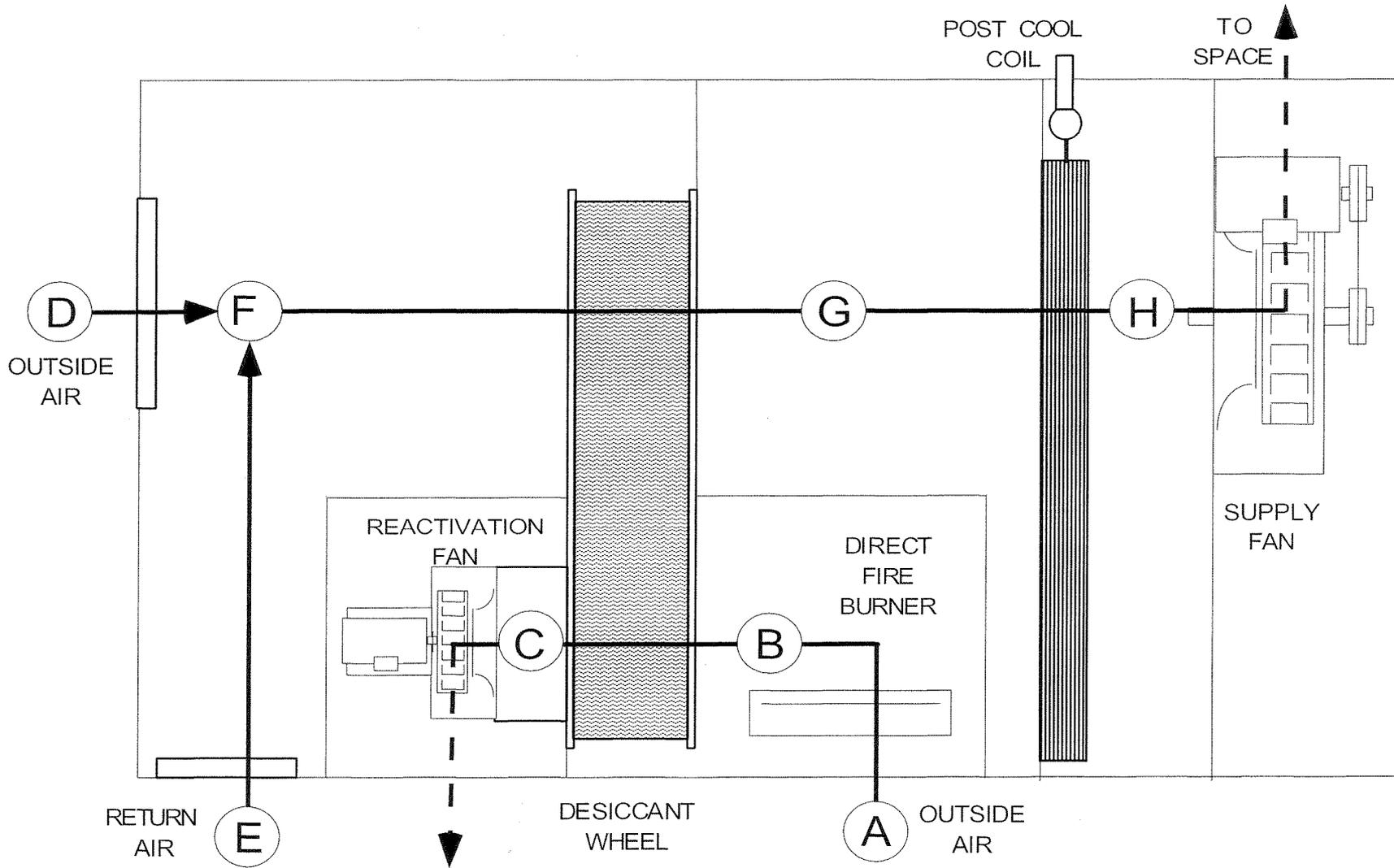
<b>FILTERS</b>
TYPE
<b>ELECTRICAL</b>
SYSTEM VOLTAGE (V/P/H)
CONTROL CIRCUIT VOLTAGE
SUPPLY MOTOR AMPS
REACTIVATION MOTOR AMPS
CONTROL TRANSFORMER AMPS
UNIT FLA
UNIT MCA
UNIT MOP
DISCONNECT SIZE

30% PLEATED DISPOSABLE
460/3/60
120 V
33.8
17
2.2
53.0
61.5
95
80

FILE: Pacific Coliseum A40G 807938 Rev 00

# Pacific Coliseum

REV 00



		A	B	C	D	E	F	G	H
SUMMER	SCFM	6050	6050	6050	20000	0	20000	20000	20000
	DEGREES F	52	275	120	52	-	52	99	51
	GR / LB	57	95	262	57	-	57	7	7

C 1

# ENGINEERING GUIDE SPECIFICATIONS FOR MUNTERS A40G

## Pacific Coliseum

### GENERAL

Furnish and install MUNTERS DH® unit(s) or approved equal. Sizes, arrangements, capacities and performance shall be as indicated on plans and schedules.

Munters unit(s) shall be factory preassembled, tested and shipped complete with all components necessary to maintain humidity levels independent of load variations within design limits. Units shall be ETL listed and manufactured in an ISO9001 certified manufacturing plant.

Munters unit(s) shall be designed for year round 24 hr/day service and indoor installation requiring only connection of ductwork, utilities, and remote sensor(s).

A space humidistat set point shall be maintained by staged control of the Munters Honeycombe Dehumidifier of type, size, and capacity shown in schedules.

At reduced humidity levels the humidistat sensor shall cause the dehumidifier to shut down. At increased humidity levels the process shall be reversed.

Reactivation energy shall be in the form of heat from a direct-fired gas burner. The heat shall be automatically modulated to conserve energy at reduced humidity loads.

### CONSTRUCTION SPECIFICATION - BASE

Unit base shall be all steel bolted construction with formed 12 gauge galvanized steel channel around the outside perimeter. Cross support members shall be 12 gauge galvanized steel channel bolted to the perimeter channel. Completed base shall be constructed with G 90 galvanized materials. Base shall be provided with steel lifting lugs that do not rely on shear strength of bolts to hold unit while lifting. Welding on base shall not be permitted.

Floor panels shall be double wall construction with no through conductors of heat. Double wall floor panels shall be sandwich construction with heavy gauge galvanized sheet metal on both the top and bottom surface and insulated with 2 inches of urethane foam to give an insulation value of R-14. The urethane foam shall be foamed in place and have a nominal in place density of 2.2 to 2.5 lbs/cu ft.

### CABINET

The unit housing shall be double wall panel in frame construction and shall have no through conductors of heat. The panels shall be sandwich construction with heavy gauge galvalume steel on the outside and galvanized steel on the inside. The panels shall be insulated with 2 inches of urethane foam to give an insulation value of R-14. The urethane foam shall be foamed in place and have a nominal in place density of 2.2 to 2.5 lbs/cu ft. The frame shall have no through conductors of heat.

Full size service doors shall provide access to all service areas. Doors shall be furnished with compression type latches, and resilient gaskets. All access doors shall be sandwich construction with heavy gauge galvalume steel on the outside and galvanized steel on the inside. The doors shall be insulated with 2 inches of urethane foam to give an insulation value of R-14. The urethane foam shall be foamed in place and have a nominal in place density of 2.2 to 2.5 lbs/cu ft. The door shall have no through conductors of heat.

## **DEHUMIDIFIER & CONTROL COMPONENTS**

Dehumidifier shall be of design and construction proven in the field by minimum of ten years operating performance.

Dehumidifier shall be non-cyclic sorption type with a single desiccant rotary structure designed for continuous operation. Construction arrangement shall be provided counter flow of process and reactivation air streams with full face pressure seals to prevent cross leakage with static pressure differentials up to 8 inches water gauge.

The rotary structure will consist of 100% inert silicates impregnated with an inorganic, non-granular, crystalline desiccant which transfers water in vapor phase or of a non-crystalline form of silicon dioxide Titanium (silica gel). The design shall assure laminar air flow through the structure for minimum pressure loss with maximum transfer surface.

The dehumidifier shall include: a HoneyCombe desiccant wheel and drive system, direct fire reactivation heater, fan and motor assemblies for reactivation and process air flow, reactivation and process air flow indicating gauges, inlet filters for reactivation and process air, reactivation energy control system, overheat, and rotation fault circuitry.

## **FANS**

The units shall be equipped with supply air and reactivation air fans to provide the scheduled airflows at the static pressure indicated. All fans or components shall be rated in accordance with AMCA standard 210.

Supply air fan shall be single width, single inlet with backward airfoil blades and shall be belt drive with adjustable pulley. The supply fan shall include seismic restraints.

Reactivation air fan shall be single width, single inlet with backward air foil blades and shall be direct drive.

Motors shall be TEFC NEMA Design B with Class F insulation and a 1.25 service factor.

## **FILTERS**

Process air inlet, and return air inlet plenums shall be equipped with heavy gauge galvanized steel racks to provide for easy removal of filters. Filters shall be 2 inches thick, pleated disposable type with a non-woven media held in place by a wire support grid. Filters shall be 25%-30% average efficiency per ASHRAE test standard 52-76.

## **DIRECT FIRE REACTIVATION**

Direct fire gas reactivation is used to reactivate the silica gel. The direct fire burner will be capable of an input capacity of 1,500,000 BTUH at a constant airflow. The burner shall produce no measurable carbon monoxide in the airstream.

The system shall be designed to meet ANSI requirements.

The control system shall provide fully automated control of the furnace. The controls shall modulate the heat to conserve energy at reduced humidity loads.

## **DAMPERS AND LOUVERS**

Return air damper shall be constructed with heavy gauge galvanized steel frames, galvanized steel blades with oil bushings. Dampers shall be of the opposed blade type and shall include motorized actuators.

Louvers for outside air intake of reactivation air shall be provided as an integral part of the unit housing.

## **WATER COILS**

Water coils shall be sized to provide the full capacity scheduled. Coils shall be constructed with 5/8 inch O.D. seamless copper tubes mechanically expanded for a permanent bond to aluminum fins.

Water coil assemblies shall include 16 gauge galvanized steel casings with a support mounting structure that permits coil removal through side access and shall extend the length of the coil and beyond the air-leaving side. Coils shall include a 20 gauge stainless steel drain pan with 16 gauge support. Coils shall be approved for a maximum working pressure of 300 PSIG.

## **ELECTRICAL**

The main electrical control panel shall be located in a protected area to prevent water entry. All electrical controls shall be UL listed, and the entire unit factory wired in accordance with National Electrical Code. The unit shall be supplied with a non-fused main power disconnect mounted in the control panel and engaged by an operating mechanism on the panel door. A single point power connection shall be provided for all units.

## SEQUENCE OF OPERATION Rev 00

The Munters unit is an environmental control system designed specifically for the unique dehumidification for ice rinks and other unique facilities.

With the main disconnect turned on, and the Auto-Off-Manual switch at the electrical panel turned to the Auto position, the supply fan will energize in response to a signal from a remote panel or humidistat. If the humidity level in the space exceeds the control set point, then the Honeycombe is energized.

The dehumidifier consists of a Honeycombe desiccant wheel, a wheel drive motor, a process air circuit, and a reactivation air circuit. On a call for dehumidification, the desiccant wheel drive motor is energized to rotate the wheel through the process and reactivation air streams at a rate of 8 RPH. The supply fan is energized to draw return air from the space and/or outside air through the desiccant wheel. The desiccant draws water vapor from this air stream which is then returned to the space through the supply fan. The reactivation air fan and heater are energized to draw heated outside air through the wheel. The air is heated by the auxiliary gas direct-fired heater and this heated air drives the moisture from the desiccant and is discharged to the atmosphere.

The dehumidification process is continuous as the desiccant wheel rotates through the process and reactivation streams. When the space humidity returns to its control set point, the dehumidifier is de-energized.

When the supply air temperature rises above the control set point, the post-cooling coil modulates to maintain the desired supply air temperature.

### Desiccant Wheel Timer (2TR)

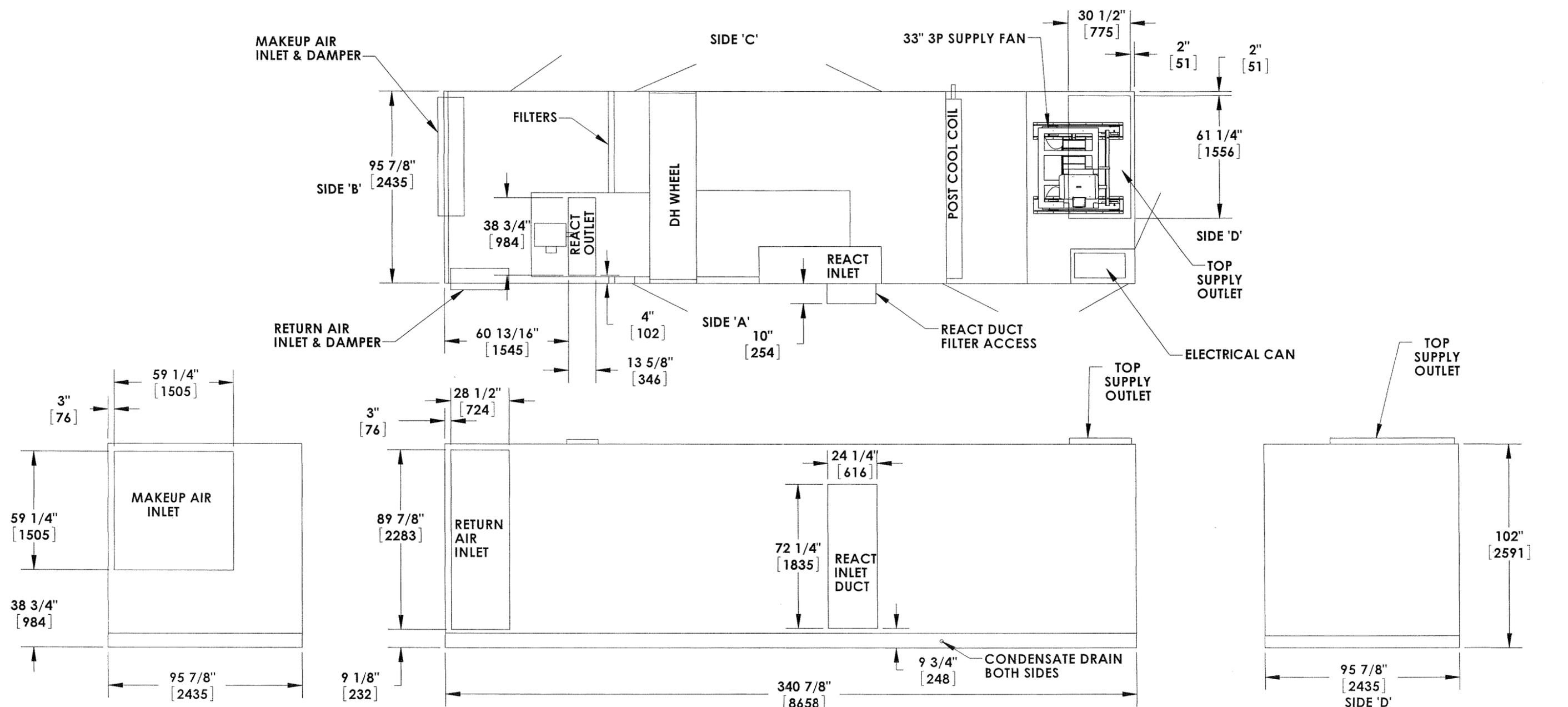
**Programming:** The Time Delay Relay is programmed for the “Accumulative Delay on Make Interval” mode with settings of 240 minutes on the input switch (TD1) and 20 minutes on the output (TD2).

**Wiring:** The Time Delay Relay has two output contacts (DPDT). The first set of contacts is wired NO in parallel with the dehumidifier-on relay to hold the dehumidifier on during the time 2TR is energized.

**Sequence of Operation:** When the supply fan accumulates 240 minutes of run time, the time delay relay switches its contacts and the reactivation fan, DH wheel, and gas heater are energized. This insures complete drying of the wheel.

S71029-041

REV.	DESCRIPTION	BY	DATE	CHKD	DATE	E.C.O. NO.
01	GENERAL REVISION	MDR	02-01-07	MDR	02-01-07	...
02	CHANGE THE SUPPLY DISCHARGE FROM SIDE 'C' TO TOP	TWR	5/9/07	TWR	5/9/07	...



# PRELIMINARY DRAWING

DRAWING IS SUBJECT TO REVISIONS

SIDE CLEARANCES:  
 SIDE 'A' = 60" [1524]  
 SIDE 'B' = 48" [1219]  
 SIDE 'C' = 60" [1524]  
 SIDE 'D' = 48" [1219]

WEIGHT = 11,080 LBS [5026 KG] +/- 10%

### CONFIDENTIALITY STATEMENT

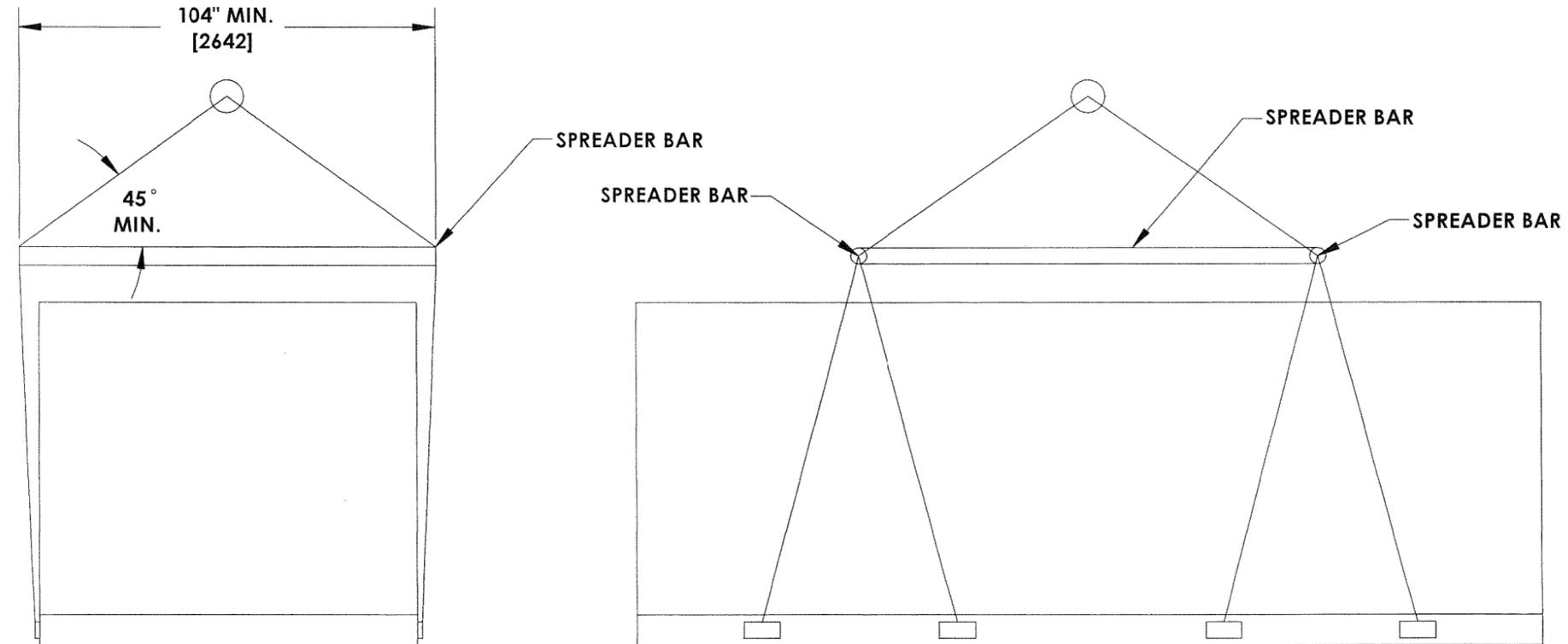
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All Dimensions Are In Inches Unless Otherwise Specified		DRAWING TITLE: <b>A40 WITH POSTCOOL, INDOOR</b>	
TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± 1/32 ± .005 ± 1/2 Deg		MATERIAL:	
Detailed by: <b>MDR</b>	Date: <b>11-07-06</b>	SPEC:	
Chk. By: <b>MGY</b>	Date: <b>11-07-06</b>	SHEET: <b>1 OF 2</b>	
Appr. By: <b>PJT</b>	Date: <b>11-07-06</b>	PART NUMBER: <b>S71029-041</b>	SIZE <b>B</b>

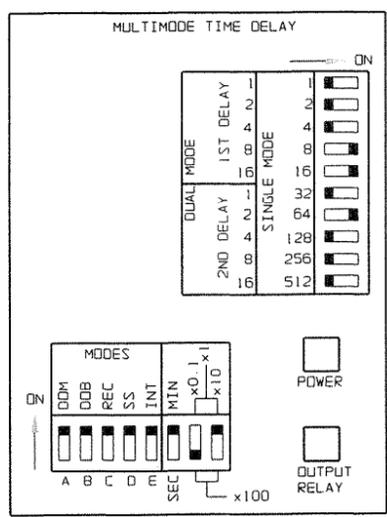
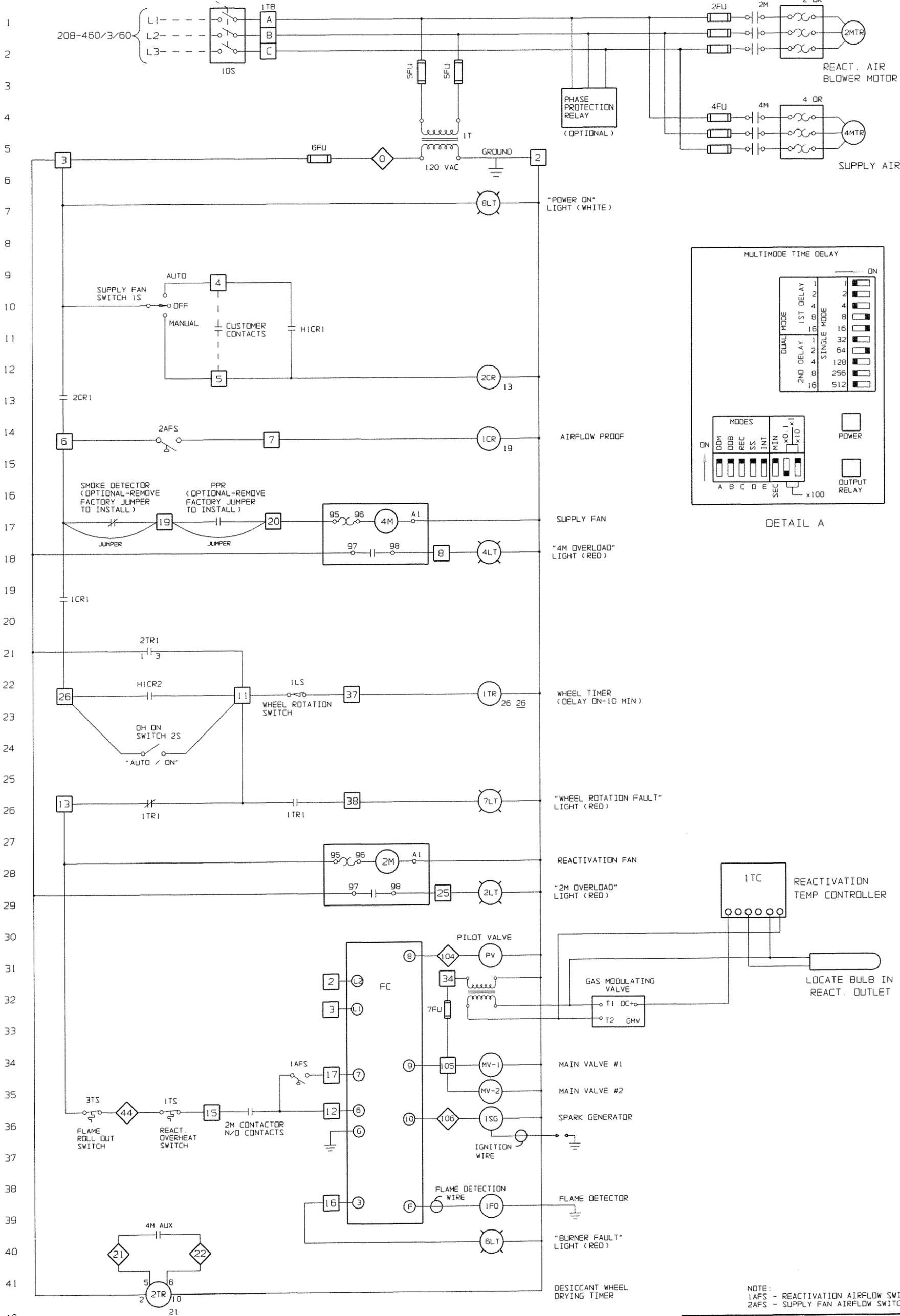
S71029-041	REV.	DESCRIPTION	BY	CHKD	E.C.O.
			DATE	DATE	NO.

# CAUTION ATTENTION RIGGER



NOTES:  
 LIFT ONLY USING SUPPLIED LIFTING LUGS.  
 CRANE AND RIGGING MUST BE CAPABLE  
 OF HANDLING 11,080 LBS, [5026 KG] ±10% LOAD.  
 SPREADER BAR MUST BE USED TO PREVENT  
 RIGGING CABLES FROM SQUEEZING IN TOP  
 OF UNIT. SPREADER BAR MUST BE A MINIMUM  
 OF 104" [2642mm] BETWEEN LOWER CABLE ATTACHMENT  
 POINTS. UNIT MUST BE RIGGED USING ALL 8  
 LIFTING LUGS (4 PER SIDE) OR SEVERE DAMAGE  
 MAY RESULT. UNIT MUST REMAIN LEVEL DURING LIFT.

<b>CONFIDENTIALITY STATEMENT</b>		
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All Dimensions Are In Inches Unless Otherwise Specified TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± 1/32 ± .005 ± 1/2 Deg		
	DRAWING TITLE: <b>RIGGING INSTRUCTIONS</b>	
MATERIAL:	SPEC:	
SHEET: 2 OF 2	PART NUMBER: S71029-041	SIZE B



SET MULTIMODE RELAY PER DETAIL A

NOTE:  
1AFS - REACTIVATION AIRFLOW SWITCH  
2AFS - SUPPLY FAN AIRFLOW SWITCH

Munters Corporation  
Commercial Dehumidification Division  
WIRING: A40G/MOT DMPRS

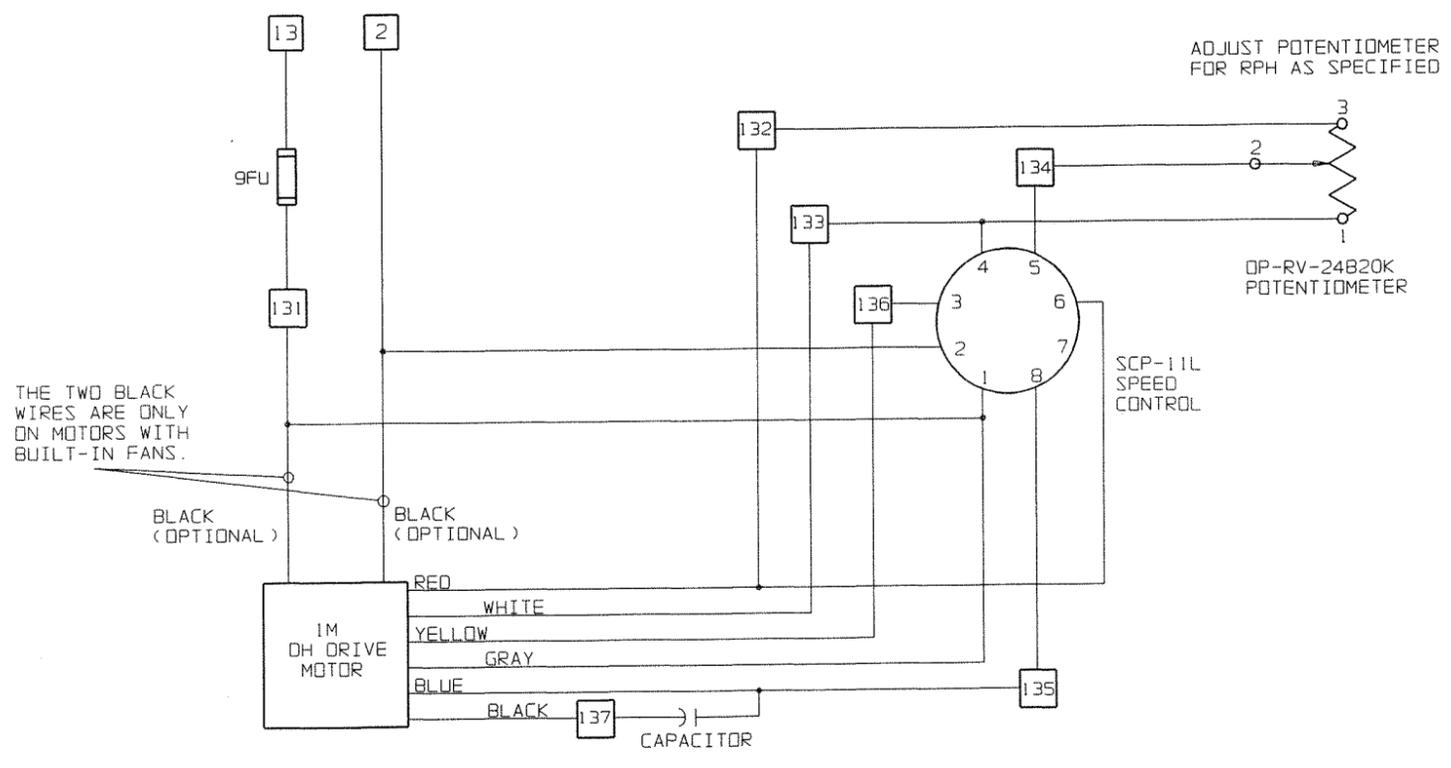
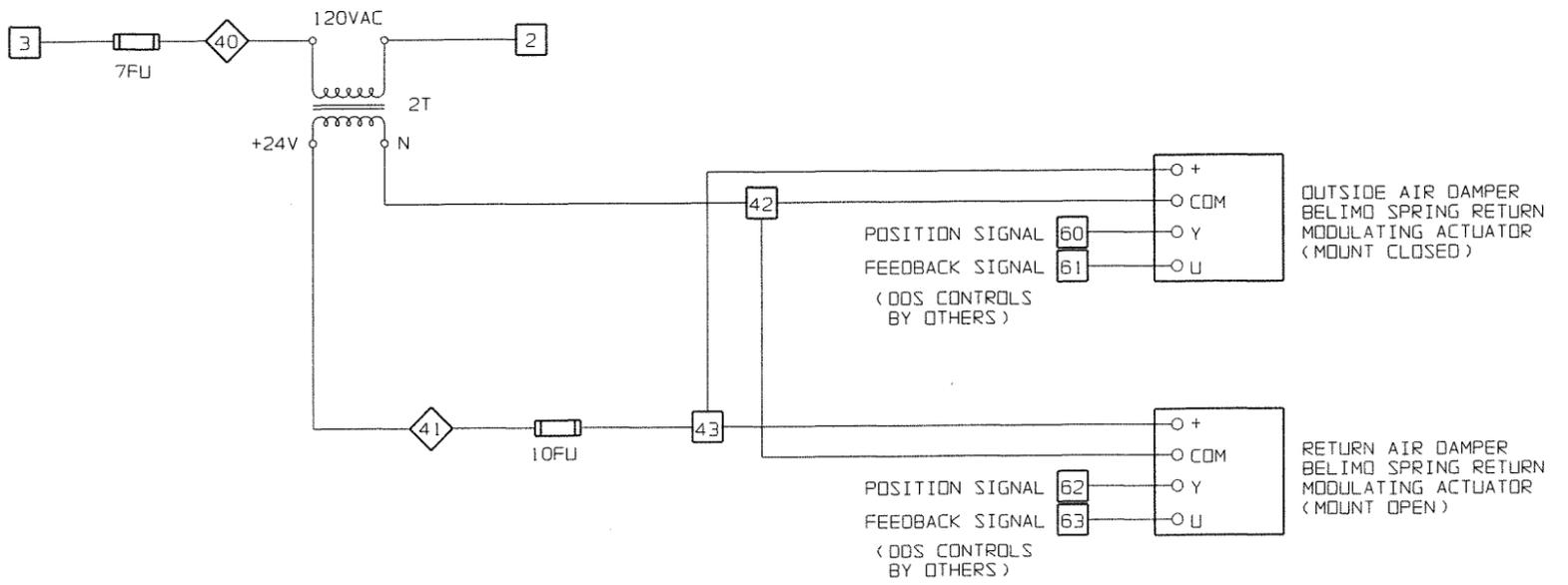
DRAWN MRN 5-8-07	CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i> 5-9-07
PART NUMBER 4033-243G	REV. 00	SHEET 1 OF 2

SYMBOLS:  
 □ WIRE TERMINAL  
 ◇ WIRE (NO TERMINAL)  
 - - FIELD WIRING

NOTE:  
 WIRE TERMINAL / NO TERMINAL MAY BE CHANGED AS REQUIRED

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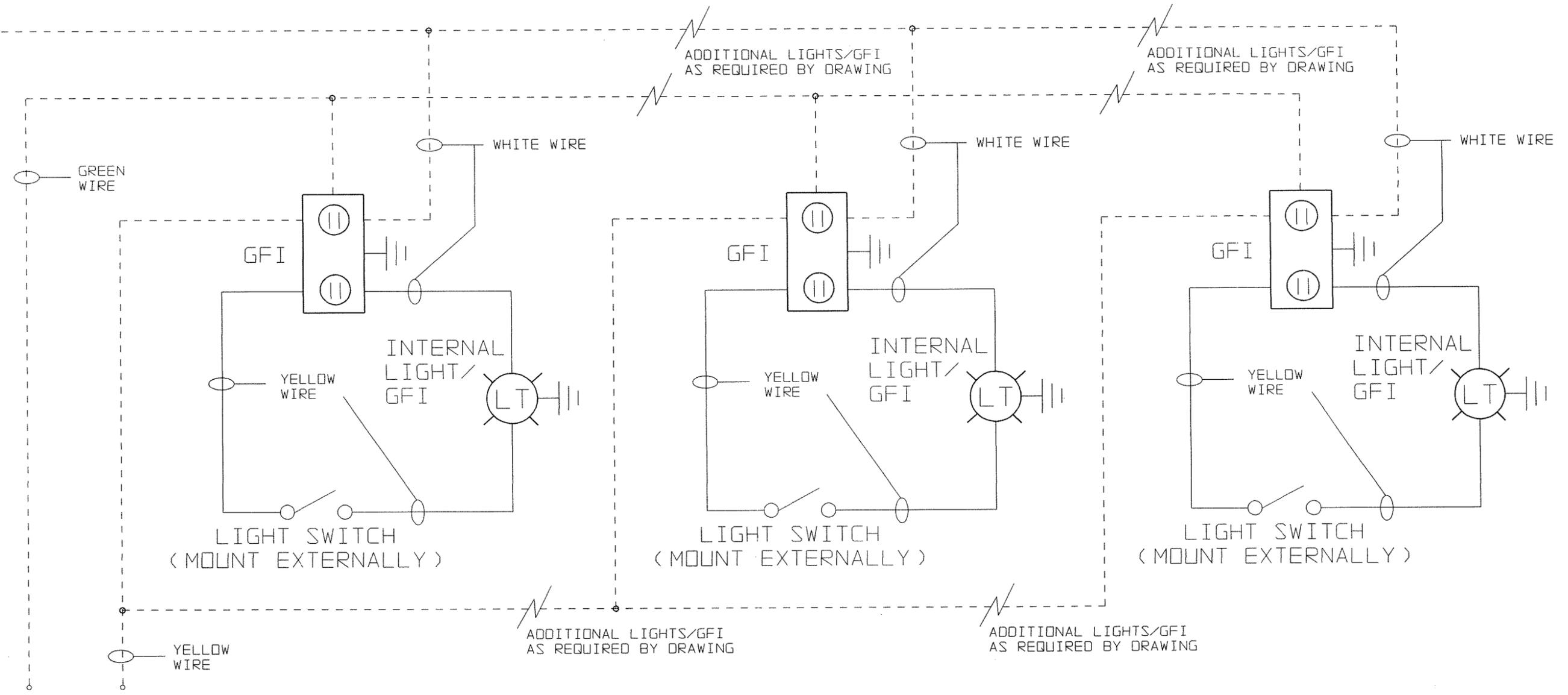
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NOTE:  
1AFS - REACTIVATION AIRFLOW SWITCH  
2AFS - SUPPLY FAN AIRFLOW SWITCH

Munters Corporation Commercial Dehumidification Division WIRING: A40G/MOT DMPRS		
DRAWN MRN 5-8-07	CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i> 5-9-07
PART NUMBER 4033-243G	REV. 00	SHEET 2 OF 2
SYMBOLS: □ WIRE TERMINAL ◇ WIRE (NO TERMINAL) -- FIELD WIRING		NOTE: WIRE TERMINAL / NO TERMINAL MAY BE CHANGED AS REQUIRED

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18 CUSTOMER PROVIDED 120VAC

19 QUANTITY OF LIGHTS DEPENDS ON SPECIFIC  
20 CUSTOMER ORDER REQUIREMENTS.

21 EACH LIGHT INSTALLED IN AREA WITH SEVICEABLE  
OR ADJUSTABLE COMPONENTS.

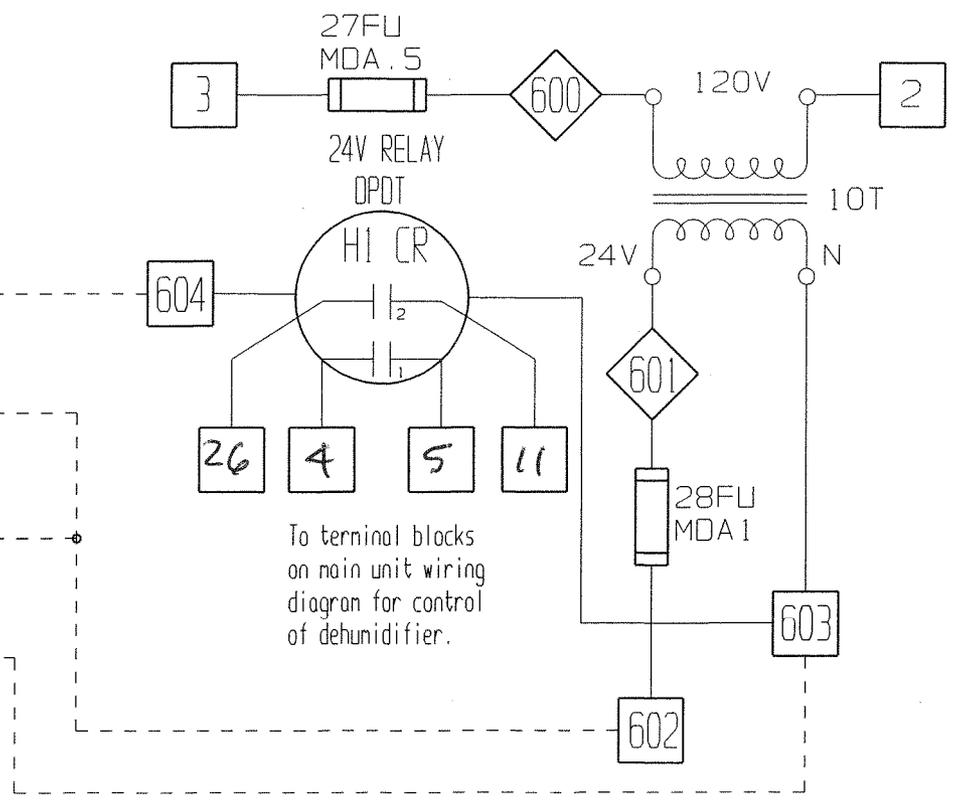
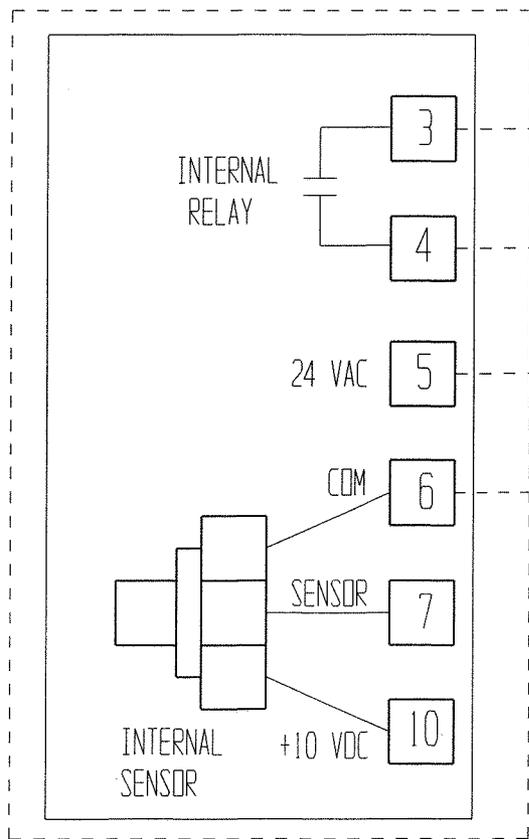
22 SEE LIGHT LOCATION DRAWING FOR DETAILS.

QUANTITY OF LIGHTS 4

JOB # 807930  
-1, -2, -3

Munters Corporation			
Commercial Dehumidification Division			
WIRING: GFI WITH LIGHTS			
DRAWN	CHECKED	APPROVED	
MRN 8-28-06	MRN 8-28-06	MRN 8-28-06	
PART NUMBER	REV.	SHEET	
4500-58	00	1 OF 1	
SYMBOLS:		NOTE:	
□ WIRE TERMINAL	◇ WIRE (NO TERMINAL)	WIRE TERMINAL / NO TERMINAL MAY BE CHANGED AS REQUIRED	
-- FIELD WIRING			

Field installed in space.  
Adjust RH setpoint as required.



To terminal blocks  
on main unit wiring  
diagram for control  
of dehumidifier.

Viconics Humidistat  
H200-30-21-10

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<b>SYMBOLS:</b> □ WIRE TERMINAL BLOCK ◇ WIRE (NO TERMINAL) - - - FIELD WIRING		Munters Corporation Commercial Dehumidification	
Detailed by: MRN	Date: 11-18-04	DRAWING TITLE: H200-10-21-10 VICONICS HUMIDISTAT	
CK. By: MRN	Date: 11-18-04	PART NUMBER: 4800-00	
Appr. By: MRN	Date: 11-18-04	SHEET: 1 OF 1	REV: 04

# Mechanovent Corporation

MVP

Fan Selection Data

Project:	Pacific Coliseum
Location:	Reactivation Fan
Contact:	

## Fan Design

Product:	Backward Inclined Wheel for Unhoused SWSI Apps	Arrangement:	[not specified]
Size/Model:	18	Drive type:	Direct
Wheel Type:	Std Airfoil	AMCA Performance Class:	3
Wheel Material:	Mild Steel		
Wheel Width:	90 %	Wheel Diameter:	100.0 %

## Operating Conditions

Volume Flow Rate:	6,050 CFM	Fan Speed:	3500 rpm
Fan Static Pressure:	10.5 in wg	Fan Input Power:	14.4 bhp
Wheel Type:	Std Airfoil	AMCA Performance Class:	3
Altitude (above mean sea level):	0 ft	Operating Temperature:	120 Deg F
Operating Inlet Airstream Density:	0.0685 lb/ft <sup>3</sup>		
Static Efficiency:	69.38%		
Maximum Operating Temperature:	120 Deg F	Maximum Safe Operating Speed:	3752 rpm

Operating cost is \$2,357.11 for 2080 hours with a 90% efficient motor when energy unit cost per kW-hr is 0.095

Plenum Configuration: Three Walls, Wheel Offset; d/D ratio = 0.25

## Operating Conditions at 70 Deg F

Volume Flow Rate:	6,050 CFM	Fan Speed:	3500 rpm
Fan Static Pressure:	11.5 in wg	Fan Input Power:	15.8 bhp
Density at Altitude (0 ft) :	0.0750 lb/ft <sup>3</sup>	Max. Safe Speed at 70 Deg F:	3790 rpm

## Sound Power Level Ratings

Levels expressed in dB (power levels reference 10<sup>-12</sup> watts)

## Estimated Sound Pressure Levels

Levels expressed in dB (pressure levels reference 2x10<sup>-7</sup> microbar)

Levels in **bold text** are A-weighted.

Center Frequency (Hz):	63	125	250	500	1000	2000	4000	8000	Overall
<b>Octave Bands:</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	
Inlet Power Level dB	99.7	99.7	97.3	103.7	96.7	90.	89.7	84.3	107.3
Inlet Pressure Level dBA	<b>62.7</b>	<b>72.7</b>	<b>77.3</b>	<b>89.2</b>	<b>85.2</b>	<b>79.5</b>	<b>79.2</b>	<b>71.8</b>	<b>91.5</b>
Outlet Power Level dB	98.7	98.7	100.	107.3	101.3	97.	95.	89.3	110.1
Outlet Pressure Level dBA	<b>61.7</b>	<b>71.7</b>	<b>80.</b>	<b>92.8</b>	<b>89.8</b>	<b>86.5</b>	<b>84.5</b>	<b>76.8</b>	<b>95.7</b>

Directivity/Reflection Factor (Q) is 2, hemispherical radiation; Distance is 5 ft.

Please note:

This fan curve represents a static condition higher than design in order to compensate for system losses. With the fan installed there is an internal system effect that will de-rate the available static for external requirements.

Although the fan curve may depict additional static, that extra static is not available for use. See page B1 for each fan's static requirements at design, both external and total (total static is internal plus external).

# Mechanovent Corporation

MVP

Backward Inclined Wheel for Unhoused SWSI Apps Volume Flow Rate: 6,050 CFM

Temp.: 120 Deg F

18 Std Airfoil, 90.0% Width

Fan Static Press.: 10.5 in wg

Altitude: 0 ft

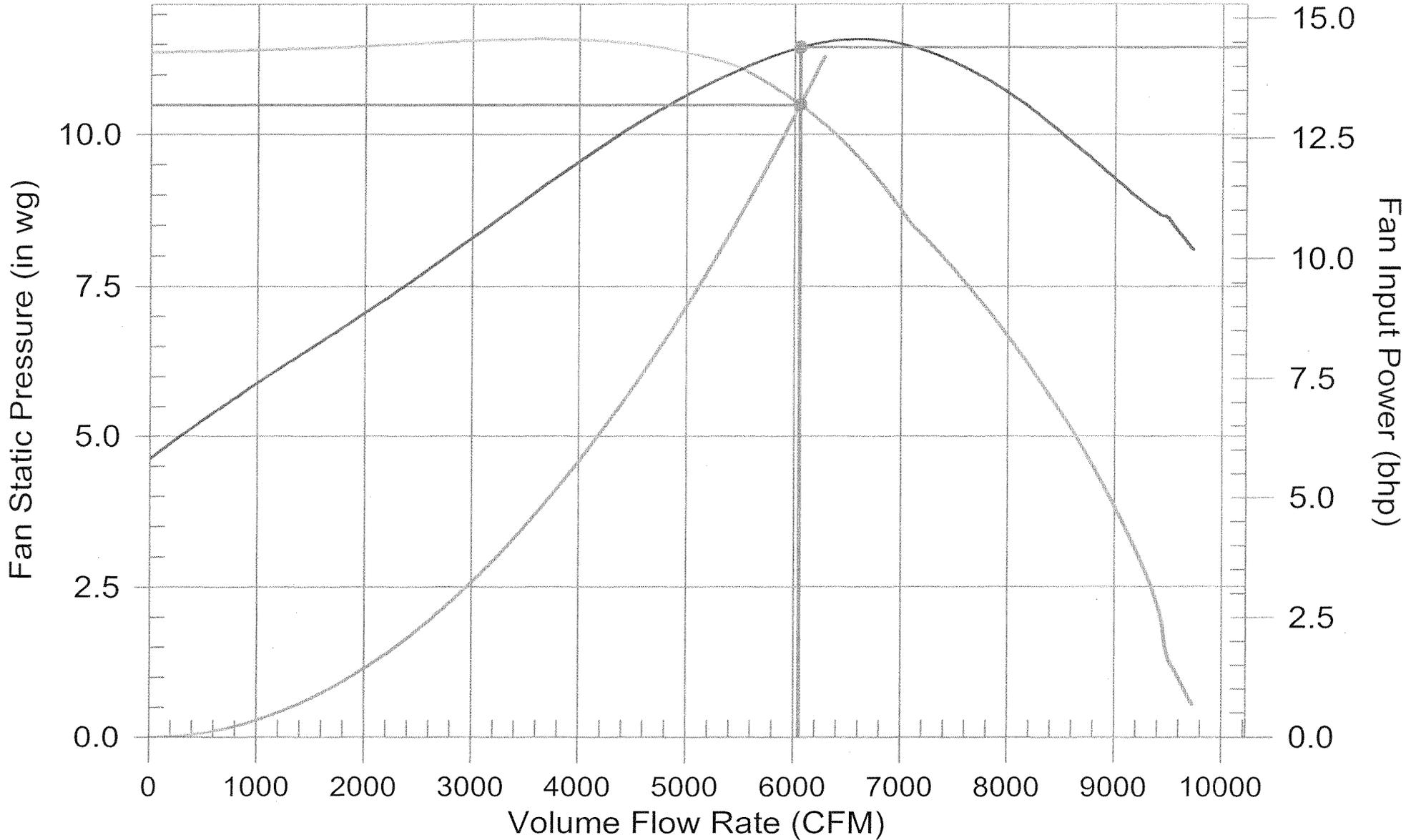
Class: 3

Speed: 3500 rpm

Density: 0.0685 lb/ft<sup>3</sup>

Plenum Effect (Three Walls Offset, d/D = 0.25)

Power: 14.4 bhp



**Mechanovent Corporation**  
MVP  
Fan Selection Data

Project:	Pacific Coliseum
Location:	Supply Fan
Contact:	

**Fan Design**

Product:	Backward Inclined Wheel for Plenum Apps	Arrangement:	[not specified]
Size/Model:	333	Drive type:	Belt
Wheel Type:	Std Airfoil	AMCA Performance Class:	3
Wheel Material:	Mild Steel		
Wheel Width:	100 %	Wheel Diameter:	100.0 %

**Operating Conditions**

Volume Flow Rate:	20,000 CFM	Fan Speed:	1496 rpm
Fan Static Pressure:	4.95 in wg	Fan Input Power:	23.4 bhp
Wheel Type:	Std Airfoil	AMCA Performance Class:	3
Altitude (above mean sea level):	0 ft	Operating Temperature:	70 Deg F
Operating Inlet Airstream Density:	0.0750 lb/ft3		
Static Efficiency:	66.55%		
Maximum Operating Temperature:	70 Deg F	Maximum Safe Operating Speed:	2080 rpm

Operating cost is \$3,830.04 for 2080 hours with a 90% efficient motor when energy unit cost per kW-hr is 0.095

Plenum Configuration: Ducted Radial Discharge w/o Bell Transition

**Sound Power Level Ratings** Levels expressed in dB (power levels reference 10<sup>-12</sup> watts)

**Estimated Sound Pressure Levels** Levels expressed in dB (pressure levels reference 2x10<sup>-7</sup> microbar)

Levels in **bold text** are A-weighted.

Center Frequency (Hz):	63	125	250	500	1000	2000	4000	8000	Overall
Octave Bands:	1	2	3	4	5	6	7	8	
Inlet Power Level dB	91.4	93.	99.4	91.4	89.4	86.4	84.4	82.4	101.8
Inlet Pressure Level dBA	<b>54.4</b>	<b>66.</b>	<b>79.4</b>	<b>76.9</b>	<b>77.9</b>	<b>75.9</b>	<b>73.9</b>	<b>69.9</b>	<b>84.4</b>
Outlet Power Level dB	92.4	95.5	104.	99.4	95.4	91.9	87.9	84.4	106.5
Outlet Pressure Level dBA	<b>55.4</b>	<b>68.5</b>	<b>84.</b>	<b>84.9</b>	<b>83.9</b>	<b>81.4</b>	<b>77.4</b>	<b>71.9</b>	<b>90.1</b>

Directivity/Reflection Factor (Q) is 2, hemispherical radiation; Distance is 5 ft.

Your Representative:  
0



The Mechanovent Corporation certifies that the Backward Inclined Wheel for Plenum Apps fan is licensed to bear the AMCA Air Performance Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and comply with the requirements of the AMCA Certified Ratings program.

AMCA Licensed for Air Performance without Appurtenances. Power (bhp) excludes drives.

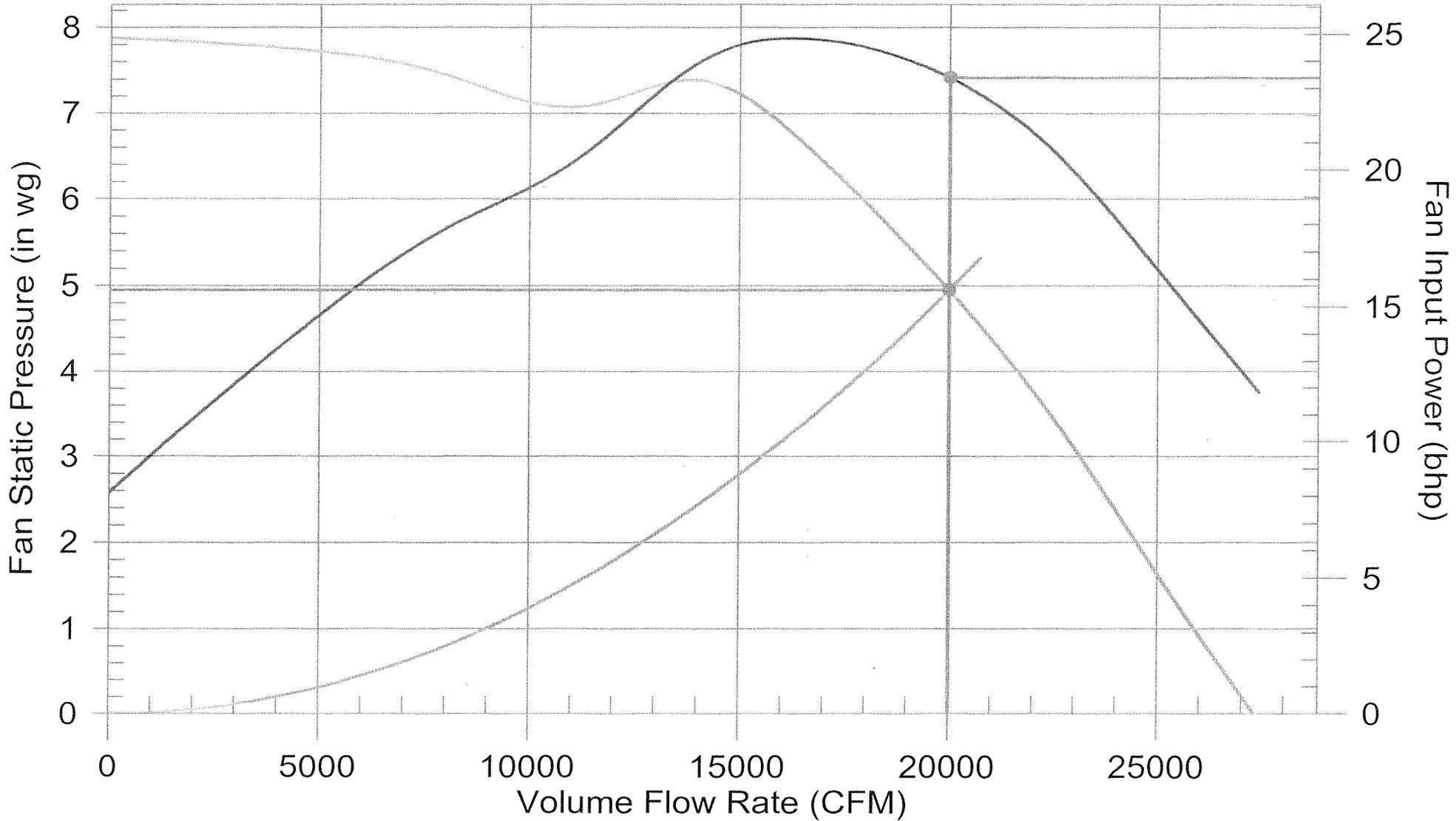
# Mechanovent Corporation

MVP

Backward Inclined Wheel for Plenum Apps  
333 Std Airfoil  
Class: 3  
Plenum Effect (Radial, ducted w/o bell)

Volume Flow Rate: 20,000 CFM  
Fan Static Press.: 4.95 in wg  
Speed: 1496 rpm  
Power: 23.4 bhp

Temp.: 70 Deg F  
Altitude: 0 ft  
Density: 0.0750 lb/ft<sup>3</sup>



AMCA Licensed for Air Performance without Appurtenances. Power (bhp) excludes drives.  
Performance shown is for installation type: A - Free inlet, Free outlet.

[v1.66.0000 -- May, 2001] Date Printed: 5/7/2007  
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Your Sales Representative:  
0

Customer: Pacific Coliseum  
 Contact:  
 Telephone:  
 Fax:  
 Job: CH807938

Date: 5/7/2007  
 From:  
 Company: Munters Dry Cool  
 Return Tel: 210-651-5018  
 Return Fax: 210-651-9085

**GIVEN DATA**

Construction

Item: Post Cool  
 Coils Per Bank: 1  
 Allow Opp. End: No  
 Tube OD IN: 5/8  
 Coil Duty: Cool-Standard  
 Fins Per Inch: 10  
 Rows: 8  
 Fin Surface: B  
 Fin Height (IN): 78.00  
 Finned Length (IN): 82.00  
 Tubing Mat. (IN): 0.020 Copper  
 Fin Mat. (IN): 0.0075 Aluminum  
 Conn Qty/Size (IN): 1 / Optimize  
 Circuiting: Double

Air Side

Air Flow (Sft<sup>3</sup>/min) 20,000  
 Altitude FT: .00  
 Ent. Air DB/WB °F: 99.00 / .00  
 Lvg. Air DB/WB °F: 51.00 / .00  
 Total / Sensible MBH: .00 / .00  
 Max Air PD "H2O: .00

Fluid Side

Fluid Type: Water  
 Ent. Fluid : 45.00  
 Lvg. Fluid : .00  
 Fluid Flow gal/min: 207.0  
 Max FPD FT H2O: .00  
 TurboSpirals: No

OUTPUT DATA			OPTIONS	
Model Number:		5WD1008B	Casing Material:	Galvanized
Air Velocity:	(Sft/min)	450.3	Casing Type:	Flanged
Total Capacity:	MBH	1,038	Hand:	Left
Sens. Capacity:	MBH	1,038	Connection Material:	Copper
Lvg. Air DB:	°F	51.12	Connection Type:	Sweat
Lvg. Air WB:	°F	.00	Vent/Drain:	.50 FPT on Face
Standard APD	"H2O	.60	Label Kit:	No
Lvg. Fluid:	°F	55.00	Corrosion Resistant Coating:	No
Fluid Flow:	gal/min	207.0	Mounting Holes:	No
Fluid PD:	FT H2O	10.03	Drain Headers:	No
Fluid Vel.:	ft/s	2.17	Boxed Headers:	No
Conn Size:	IN	(1) 3.00		
Weight (Dry):	lbm	1,018		
Weight (w/Fluid):	lbm	1,463		
Notes:		AGIL		

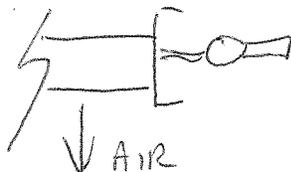
**Notes:**

A) ARI Certified And Rated In Accordance With ARI 410.

I) Header Pressure Drop Exceeds 30% of Total Fluid Pressure Drop.

G) Load below specification. Consult factory.

L) Coil rating valid for Heatcraft coils only.



INVERT TOP FLANGE



# General Installation Instructions

## Location of the unit

The unit must be set on a flat, level surface and supported around the entire perimeter of the base on either a roof curb or a slab. Proper service clearances must be provided on all four sides of the unit as follows:

Side	Unit Width	Clearance	Exception
Front	96"	72"	
Ends	96"	42"	
Back	96"	36"	

## Noise Considerations

Noise control issues should be taken into consideration when installing a rooftop or indoor air-handling unit. Modern roof and construction is normally lightweight. Where the air handler is located over noise sensitive areas, noise may be a concern. Generally, the distance between the roof-mounted equipment and the closest occupied spaces below the roof is insufficient to apply standard sound control treatments. Units should be placed above or next to spaces that are not acoustically sensitive and as far as possible from the nearest occupied space.

On curb mounted units, it is recommended that holes be cut through the roof just large enough to accommodate the ducts. The gap around the ducts should be properly sealed with an acoustical sealant after installation of the ducts. Proper duct design will reduce breakout and transition noise. Supply and return ducts should be lined with 1" minimum acoustical duct liner.

Where roof construction is particularly susceptible to vibration transmission, an isolation curb should be used. The curb deflection should be sized to be at least 15 times the deflection of the roof due to the unit weight. (Ex: if the roof deflects 1/8" due to the unit weight, the roof curb should deflect  $1/8" \times 15 = 1\ 7/8"$  due to the weight of the unit).

See 1999 ASHRAE Applications Handbook "Rooftop Mounted Air Handlers" (46.6) for further information.

## **Indoor Installation**

**Noise:** Units should be placed above or next to spaces that are not acoustically sensitive and as far as possible from the nearest occupied space. Noise sensitive indoor installations should incorporate unit vibration isolation to prevent sound transmission to internal building structure.

## **Lifting Unit**

Unit must be lifted by crane using all lifting lugs located on the sides of the unit. The crane must be selected to handle the weight shown on the General Arrangement drawing. Spreader bars that are 2" to 4" wider than the unit width must be used to prevent the rigging cables from squeezing the top of the unit. Failure to do so will damage the unit.

The base of the unit is 5" longer and 5" wider than the roof curb. There is a 2" wide rail that must sit over the curb. When setting the unit on the roof curb, insure that the unit sets properly over the curb.

## **Storage of unit**

If the unit must be stored prior to final installation on the roof curb or slab, care must be taken to set the unit on a flat surface. The unit is not designed to support its weight on an uneven surface. Storage on an uneven surface may cause damage to the unit structure.

## **Utility Connections**

### **Electrical:**

The unit has a single point electrical hookup. The control panel has an integral non-fused disconnect. An electrical service must be provided to accommodate the unit MCA (Minimum Circuit Ampacity). It must be suitably protected against short circuit and ground fault by a suitable means using the MOCP (Maximum Overcurrent Protection) stated on the nameplate.

Electrical service enters the unit from underneath through a prefabricated hole in the floor panel. If the service is to enter the unit from the side of the unit as on a slab mount, it must first pass through the base rail of the unit. Locate the existing hole through the unit floor below the electrical panel. Cut the appropriate size hole through the base rail directly below the existing hole in the floor panel. Attach a suitable watertight connector through this hole in the base rail.

### **Control Sensors**

Temperature and humidity controls or control sensors are generally mounted in the conditioned space to control cooling, heating and dehumidification functions. The conditioned space sensors should be carefully located so that they are away from supply air outlets to prevent short cycling and inadequate control of conditions in the space.

Never locate control sensors in the supply air duct. This will result in short cycling and compressor failure.

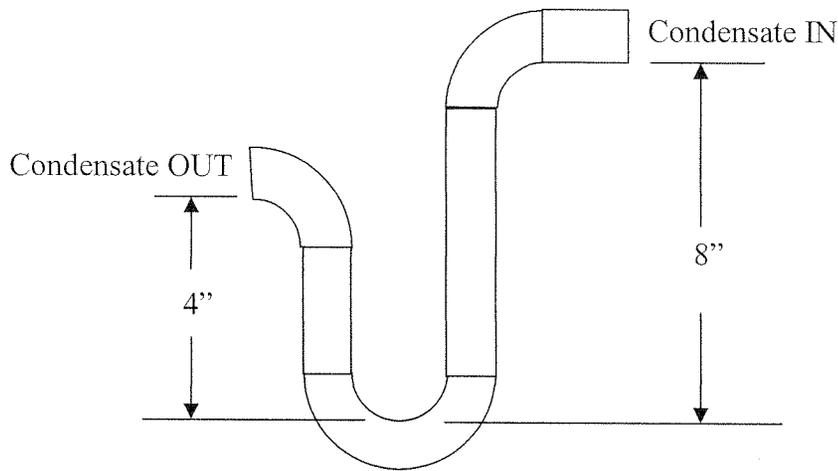
### Natural Gas or LPG:

**CAUTION! Insure that the type of gas is correct for the heaters.**

There are up to three gas connections on the unit. Gas service must be provided to each connection. The gas service must be sized according to the Equipment Data sheet located in the Manual or Submittal, or the unit nameplate located on the electrical control panel. The piping and regulator must be capable of continuously supplying the required BTUH at a pressure of 7 to 15 inches water column (11" to 15" for LPG) with the burner(s) on at full fire. The piping installer must install a proper sediment trap per National Fuel Gas Code NFPA 54 (ANSI Z 223.1) section 5.5, a pressure regulator, and a union. The pressure regulator must be a **lockup type** to prevent excessive pressure buildup during burner off periods.

### Cooling Coil Drain Connections:

Cooling coils must be properly trapped. Lack of a proper trap will admit air into the bottom of the condensate drain pan preventing draining of the pan. As water builds up, the entering air will blow water out of the drain pan. The trap must be at least 8" deep with a 4" high drain leg (see below). On units with positive pressure blow-through coils, the trap dimensions must be reversed.



### Vent connections:

Units equipped with a gas reactivation heater for will have a PVC pipe outlet labeled "REACTIVATION VENT". A small amount of reactivation exhaust will be emitted from this vent when the reactivation fan is running. On outdoor units, this vent should be left open to atmosphere. On indoor units, this vent must be routed to a drain or to a point outside the building. The pipe must be continuously sloped 1/4" per foot toward the drain or outlet. If this vent is piped to a drain, it must be sealed to the drain to prevent reactivation exhaust from entering the building.

## Ducting

### **Indoor Units**

**Reactivation ducting:** Reactivation air must be ducted to the outside of the building away from any air intakes into the building. The duct should be at least the same size as the reactivation outlet and as short as possible. The weather flapper must be removed prior to duct installation. The duct must be insulated on the outside and sloped toward the outside a minimum of  $\frac{1}{4}$ " per foot. The duct connections must be sealed so that air does not leak out. The air inside the reactivation duct is very wet and moisture will condense and cause corrosion if the proper material is not selected. The recommended material for the inside of the duct is aluminum or stainless steel. The reactivation vent pipe on the side of the unit must be piped to a drain or outside the building.

**Makeup air ducting:** Makeup air inlet(s) must be ducted to the outside. Care should be taken to locate the inlet where it will not entrain air from a contaminating source.