Kraemer Consulting Engineers, P.L.L.C.
Mechanical & Electrical Engineers

Submittal Review

SUBMITTAL REVIEW NOTES

1. Correction or comments made on the submittals during review do not relieve the contractor from compliance and requirements of the sealed contract design drawings and specifications.
2. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents.
3. The contractor is responsible for confirming and correlating all quantities and dimensions; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner.
4. The contractor is responsible for confirming the electrical requirements of each piece of equipment with the electrical drawings, Electrical Engineer, and Architect prior to ordering equipment.
5. The General Contractor and the Architect are also responsible for reviewing submittals prior to issuing to the field or ordering of equipment or materials.
6. Each trade is responsible for coordinating submittal information with the other trades as required.
7. Please review submittal thoroughly for additional stamps and notes on subsequent pages. A stamp on the front page does not constitute acceptance of entire submittal.
8. Submittals returned marked "REVIEWED - MAKE CORRECTIONS NOTED" do not require resubmittal provided that the Contractor agrees to comply with all exceptions noted in the submittal, and so states in a letter to the Architect. Provide final record submittal to the general contractor.
9. Submittals marked "REVISE AND RESUBMIT" requires a subsequent review based on the submittal comments.
10. Submittals marked "REJECTED" requires a subsequent review of an alternate equipment manufacturer. The submitted manufacturer is not acceptable based on the project contract documents and/or was not prior approved.
11. Final approval of the submittal for equipment procurement is the responsibility of the submitting contractor.
12. Equipment proposed for early release by the contractor or Owner, prior to the issuance of signed and sealed set of construction documents, are to be considered "released at risk" with the understanding that possible changes to this equipment may be required based upon (1) city comments from the authority having jurisdiction, (2) information obtained from the Owner or (3) design changes based upon final coordination of the drawing set. The design consultant shall be held-harmless if additional costs or time delays are incurred due to these changes.

Job Name: AMAZON IXD 5M LIT3 LITTLE ROCK, AR

KCE Job Number: 24-240

Submittal Number:

Submittal Name: 230000-0001 Air Curtain

Architect: SMDC

☒ **Reviewed - No Exceptions Taken**

☐ **Reviewed - Make Corrections Noted**

☐ **Reviewed – For Record Only**

☐ **Revise and Resubmit**

☐ **Rejected**

Reviewed By: Wes Colgan

Date: 6/6/25

KRAEMER CONSULTING ENGINEERS, PLLC.
2050 W WHISPERING WIND DR, SUITE 158
PHOENIX, AZ 85085
(PH): 602-285-1669
(FX): 602-285-9450

alston
CONSTRUCTION

SUBMITTAL COVER

Project #/Name: 41-2501 Amazon IXD - LIT3
Customer: HAMILTON CONSTRUCTION MANAGEMENT LLC

Submittal Register #:	230000-0001
Spec Section:	230000
Name:	Air Curtain
Type:	Product Data
Supplier/Manufacturer:	
Notes:	

Date:	May 13, 2025
Required By:	2025-05-27
Status:	Open

Receiver: KRAEMER CONSULTING ENG PLLC
Wesley Colgan

THE CONTENT WITHIN HAS BEEN EVALUATED AND CHECKED FOR GENERAL CONFORMANCE AND COMPLIANCE WITH CONTRACT DOCUMENTS

THIS REVIEW DOES NOT RELIEVE THE SUBCONTRACTOR, FABRICATOR, OR VENDOR OF RESPONSIBILITY FOR COMPLIANCE WITH CONTRACT DOCUMENTS

ALSTON CONSTRUCTION COMPANY

Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
P.O. Box 16620
Little Rock, AR 72231
Phone 501-834-3320
Fax 501-834-5416

Date: 5/7/2025
Return Request: 5/17/2025
Project: Amazon – LIT 3
Supplier: Airetech
Manufacturer: Mars
Submittal: Air Curtains
Submittal Number: 23 00 00-02
Drawing # and Installation: Mechanical Drawings

ARCHITECT
SM Design & Consulting
855 Bloomfield Avenue, Suite 220
Glen Ridge, NJ 07028
973-259-9500

ENGINEER
Kreamer Consulting Eng, PLLC
2050 W. Whispering Wind Drive, Suite 158
Phoenix, AZ 85085
602-285-1669

GENERAL CONTRACTOR
Alston Construction
255 Schilling Blvd. Suite 110
Collierville, TN 38017
901-861-2000

MECHANICAL SUBCONTRACTOR
Comfort Systems USA (Arkansas), Inc.
9924 Landers Rd.
N. Little Rock, AR 72117
501-834-3320

Notes:

dpierce@comfortar.com

SUBMITTAL DATA

EQUIPMENT:	Mars Air Curtains
SPEC SECTION:	23 0000
TAGS:	EUH-AC (AC1-AC4), EUH-AC (AC5-AC10) EUH-RAC (RAC-1,2,3,4)
PROJECT:	Amazon LIT3 - Port of Little Rock
LOCATION:	Little Rock, Arkansas
ENGINEER:	Kraemer Consulting Engineers, P.L.L.C. Mechanical & Electrical Engineers
CONTRACTOR:	COMFORT SYSTEMS USA ARKANSAS
DATE:	4/24/2025
SUBMITTED BY:	Forrest Moseley forrest@airetechcorp.com

Mars Air Curtain Bill of Material

Qty	Model Number	Description	
4	STD272-2EHN-PW	STD272, 2Mtr, 1/2HP, Elec Htd, 460v,3ø,60Hz, 24kW, Galv, PW	AC1-AC-4
4	99-125	Switch, Industrial Metallic, Magnetic Reed, Surface Mntd, 120v, NEMA 1 (Ctrl or Pnl Req)	
4	INS-TD	Accessory, Unit Mounted, Adjustable Time Delay, 1sec-17min, 24V-120V Ctrl, Elec Htd	
4	BMS-300	Accessory, BMS Adder for Mntr&Cntrl, Elec Htd, LPV2/QP8/QP10/STD2/HV2/PH8/PH10/PH12	
4	99-145	Switch, Disconnect, Non-Fused, 600v, 60A, 3Pole, NEMA 1 (Pnl/Unit Mntd)	
6	STD236-1EEH-PW	STD236, 1Mtr, 1/2HP, Elec Htd, 208v,3ø,60Hz, 12kW, Galv, PW	AC-5 - AC-10
6	99-125	Switch, Industrial Metallic, Magnetic Reed, Surface Mntd, 120v, NEMA 1 (Ctrl or Pnl Req)	
6	INS-TD	Accessory, Unit Mounted, Adjustable Time Delay, 1sec-17min, 24V-120V Ctrl, Elec Htd	
6	BMS-300	Accessory, BMS Adder for Mntr&Cntrl, Elec Htd, LPV2/QP8/QP10/STD2/HV2/PH8/PH10/PH12	
6	99-145	Switch, Disconnect, Non-Fused, 600v, 60A, 3Pole, NEMA 1 (Pnl/Unit Mntd)	
4	PH1036-1EEH-PW	PH1036, 1Mtr, 1/2HP, Elec Htd, 208v,3ø,60Hz, 12kW, Alum, PW	RAC-1, 2, 3, 4
4	99-125	Switch, Industrial Metallic, Magnetic Reed, Surface Mntd, 120v, NEMA 1 (Ctrl or Pnl Req)	
4	INS-TD	Accessory, Unit Mounted, Adjustable Time Delay, 1sec-17min, 24V-120V Ctrl, Elec Htd	
4	BMS-300	Accessory, BMS Adder for Mntr&Cntrl, Elec Htd, LPV2/QP8/QP10/STD2/HV2/PH8/PH10/PH12	
4	99-145	Switch, Disconnect, Non-Fused, 600v, 60A, 3Pole, NEMA 1 (Pnl/Unit Mntd)	

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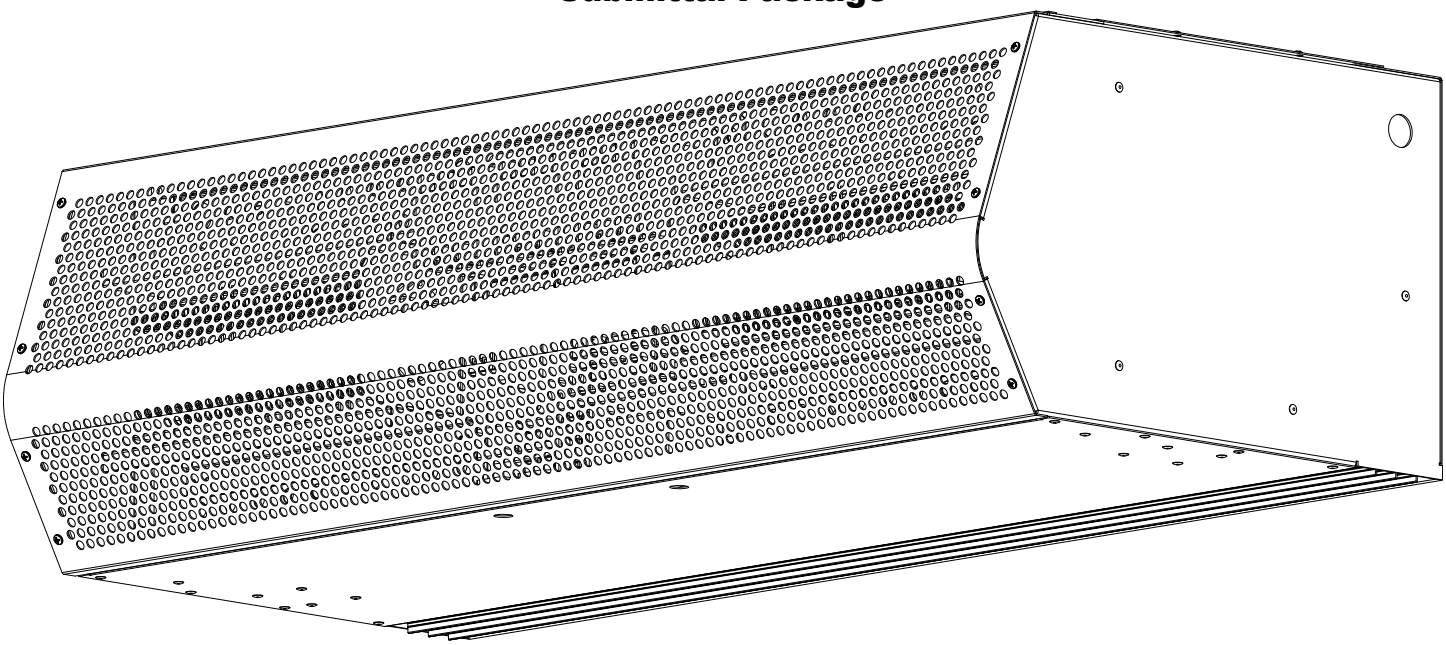
STD2 Electric Heated Series

Standard Series 2
Commercial Air Curtain
Submittal Package



Submitted by:
Mars Air Systems, LLC
14716 S. Broadway
Gardena, CA 90248

Project Name	Amazon LIT 3
P.O.#	
S.Q.	
Company	
Print Name	
Signature	
Date	

(Electronic Signature Preferred)

Company Seal or Stamp

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Table of Contents

STD2 (Standard 2) Series

Electric heated
Model Lengths: 36”–144”
Environmental Separation (up to 12’)
Insect Control (up to 10’)

AC-1 thru AC-4- STD272-2EHN-PW

AC-5 thru AC-10 - STD236-1EEH-PW

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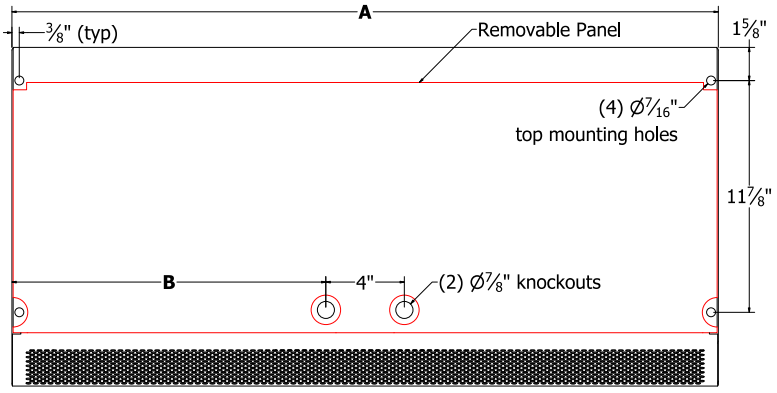
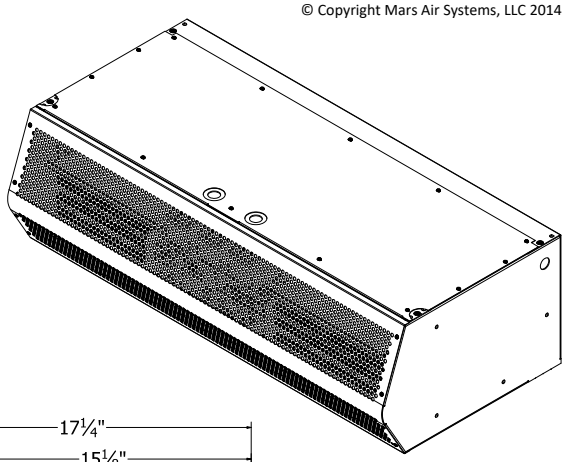
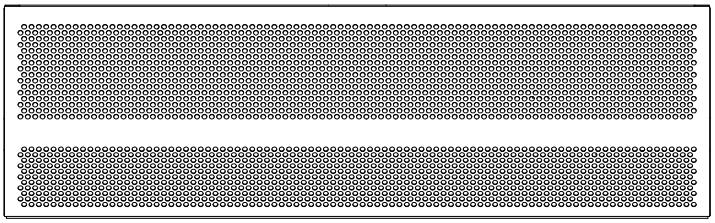
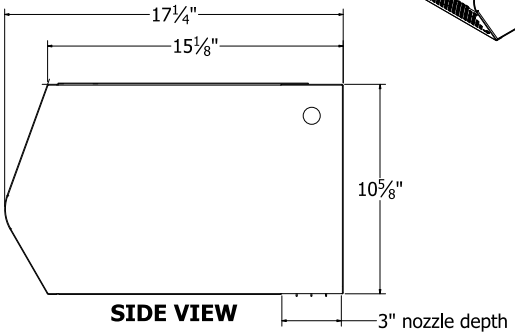


TOP VIEW

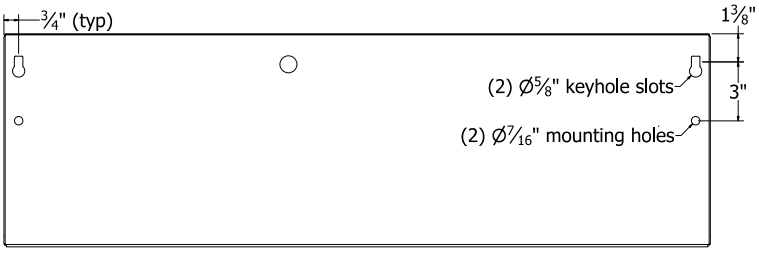




FRONT VIEW



SIDE VIEW



REAR VIEW

Intertek

Notes:

1. Recommended service clearances are 2” to the left and right sides, 24” on top, and 24” in front of the unit.
2. Circuit protection (per NEC) to be installed by others.
3. To prevent accidental damage during operation, unit must be installed so that the bottom of the air curtain does not extend below the door header.
4. Unit can be fastened to wall on both ends without intermediate support.
5. Units are shipped with Motor-Fan Assembly (MFA) factory-installed.

Model Number	Mechanical Data					AMCA Certified Lab Data				
	Overall Length A (in)	Nozzle Length (in)	Top Knockout Location B (in)	Motor (hp)	Weight (lb)	Max Core Velocity at Nozzle (in)	Avg Velocity (fpm)	Volume (cfm)	Uniformity (%)	Power Rating (watt)
☑ STD236-1E**-OB	36	36	16	½	90	3609	1387	1040	79	406
☐ STD240-1E**-OB †	40	40	18	½	95	4077	1406	1172	77	520
☐ STD242-1E**-OB	42	42	19	½	95	3537	1314	1150	82	499
☐ STD248-1E**-OB	48	48	22	½	100	3855	1149	1149	59	511
☑ STD272-2E**-OB	72	72	16	(2) ½	180	3609	1387	2080	79	812
☐ STD284-2E**-OB	84	84	19	(2) ½	190	3537	1314	2300	82	998
☐ STD296-2E**-OB	96	96	22	(2) ½	225	3855	1149	2298	59	1022
☐ STD2108-3E**-OB	108	108	16	(3) ½	270	3609	1387	3120	79	1218
☐ STD2120-3E**-OB	120	120	18	(3) ½	280	4077	1406	3516	77	1560
☐ STD2144-3E**-OB	144	144	22	(3) ½	330	3855	1149	3447	59	1533
The following model is not licensed to bear the AMCA seal										
☐ STD260-2E**-OB	60	60	13	(2) ½	130	4200	1584	2082	93	797

*** – Use corresponding letters in “Electrical Data” (see page 2) column headers, “Voltage Code” followed by “Wattage Code,” to complete the model numbers.**

Note: above data is for 60 Hz at 1725 RPM. For 50 Hz, RPM is 1425 with a 17% reduction in performance.

- *The AMCA Certified Ratings Seal applies to airflow rate, average outlet velocity, outlet velocity uniformity, velocity project, and power rating at free delivery only.*

† *Limited availability, long lead times may apply.*

NOTE: Mars Air Systems, LLC reserves the right to change specifications and product design without notice. Such revisions do not entitle the buyer to corresponding changes, improvements, additions, or replacements for previously purchased equipment.

AC-1 thru AC-4- STD272-2EHN-PW

AC-5 thru AC-10 - STD236-1EEH-PW

STD2 (Standard 2) Series

Electric heated
Model Lengths: 36”–144”
Environmental Separation (up to 12’)
Insect Control (up to 10’)

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Standard Features:

Air curtain

- ETL-certified to conform to UL 2021 (US) and CSA 22.2 (Canada) standards for indoor use
- AMCA-certified to AMCA 211 (includes performance testing per AMCA 220)
  - Certified models are approved for use as alternate to vestibules (per ASHRAE 90.1, IECC, and IgCC)
- Sleek self-contained one-piece heavy-gauge and corrosion-proof paint lock metal design
- Fire retardant and rust preventative electrostatic polyurethane powder coating
  - Standard color is Obsidian Black (OB)
- ½ HP continuous duty Totally Enclosed Air Over (TEAO) motors (NEMA 1)
- Adjustable air directional vanes with 40° sweep front to back
- 18-month parts warranty
- Freight included (FOB continental USA)
- Proudly made in the USA

Electric heater coil and wiring

- Coils are open type (for rapid temperature rise) and are located directly in the air curtain’s intake air stream
- Manual reset thermal overload protection provided
- On/off switch mounted on bottom (unit control voltage is 24V)
- Controls are internally mounted and prewired to receive power connection – accessible through the intake or top access panels
- 24-volt thermostat with “heat/off/fan” capability is shipped loose for field installation
  - Not applicable for units with SimpleLink

Three Phase Electrical Data Full Load Amp (FLA)	Unit Amperage (Voltage Code) 208V/3Ø ☑ (E)	230V/3Ø ☐ (F)	460V/3Ø ☑ (H)	Heater Kilowatts (Wattage Code) (H)	(N)	(S)	Temp Rise °F
☑ STD236-1E**-OB	36.5	33.5	16.8	12	-	-	36
☐ STD240-1E**-OB †	36.5	33.5	16.8	12	-	-	33
☐ STD242-1E**-OB	36.5	33.5	16.8	12	-	-	33
☐ STD248-1E**-OB	36.5	33.5	16.8	12	-	-	33
☐ STD260-2E**-OB	72	66	32.6	-	24	-	38
☑ STD272-2E**-OB	72	66	32.6	-	24	-	36
☐ STD284-2E**-OB	72	66	32.6	-	24	-	33
☐ STD296-2E**-OB	72	66	32.6	-	24	-	33
☐ STD2108-3E**-OB	107.5	98.5	48.4	-	-	36	36
☐ STD2120-3E**-OB	107.5	98.5	48.4	-	-	36	32
☐ STD2144-3E**-OB	107.5	98.5	48.4	-	-	36	33

* - Use corresponding letters in “Voltage Code” and “Wattage Code” column headers to complete the model numbers.
† - Limited availability, long lead times may apply.

Ampacity (MCA) = total FLA x 1.25

Amps per motor (included in values above):
2.5A @ 208-230V/1Ø; 1.8A @ 208V/3Ø; 1.6A @ 230/3Ø; 0.8A @ 460V/3Ø.

Single Phase Electrical Data Full Load Amp (FLA)	Unit Amperage (Voltage Code) 208V/1Ø ☐ (B)	230V/1Ø ☐ (C)	Heater Kilowatts (Wattage Code) (B)	(H)	(K)	Temp Rise °F
☐ STD236-1E**-OB	31.5	29.5	6	-	-	18
☐ STD240-1E**-OB †	31.5	29.5	6	-	-	16
☐ STD242-1E**-OB	31.5	29.5	6	-	-	16
☐ STD248-1E**-OB	31.5	29.5	6	-	-	17
☐ STD260-2E**-OB	63	58	-	12	-	19
☐ STD272-2E**-OB	63	58	-	12	-	18
☐ STD284-2E**-OB	63	58	-	12	-	16
☐ STD296-2E**-OB	63	58	-	12	-	17
☐ STD2108-3E**-OB	94.5	86.5	-	-	18	18
☐ STD2120-3E**-OB	94.5	86.5	-	-	18	16
☐ STD2144-3E**-OB	94.5	86.5	-	-	18	17

* - Use corresponding letters in “Voltage Code” and “Wattage Code” column headers to complete the model numbers.
† - Limited availability, long lead times may apply.

Ampacity (MCA) = total FLA x 1.25

Amps per motor (included in values above): 2.5A @ 208-230V/1Ø

Mars Recommended Accessories (see catalog for complete listing):

- Door Limit Switches (§) 99-125 Door Switch
  - ☐ 99-014, Combination mechanical switch, 250V, 1HP Max
  - ☐ 99-018, Commercial surface mounted magnetic switch, 24V
- Controllers
  - ☐ SK-EU, SimpleLink, 208-575V (460-575V, 3PH needs additional 115-230V, 1PH power), Integral Control, NEMA1
- Factory Mounted Control Options
  - ☑ INS-TD, Adjustable Time Delay (1 sec to 17 min)
  - ☐ INS-HD, Heat on Demand
  - ☑ BMS-300, BMS for monitor and control
    Note: dry contact provided in panel for monitoring motor and heater. 24Vac signal provided from panel for controlling motor and heater
- Disconnects (§)
  - ☐ 99-122 & 99-123, Non-Fused Disconnect, remote mounted, 600V, 32A & 80A respectively, 3 Pole, IP65
  - ☑ 99-***-**, Fused Disconnect, remote mounted, 240V-600V, 30A-100A, 3 Pole, NEMA3R (see disconnect submittals for complete part numbers) 99-145 disconnect
- Brackets (§)
  - ☐ B0004, Adjustable mounting bracket set, 3½” clearance
  - ☐ B0005, Adjustable mounting bracket set, 7”–13” clearance
  - ☐ B0041, Transom mounting bracket set for STD2
- Filters
  - ☐ J21‡-†, ¼” aluminum pressed frame bank filters (‡ = Model Length, † = # of Motors) (Not applicable for units with SimpleLink

(§) = Shipped loose

AMCA Certified Projection Velocity		
Model	Distance from Nozzle (in)	Average Core Velocity (fpm)
STD236-1E**	40	850
	80	610
	120	509
	160	469
	200	423

EXAMPLE

STD2 72 - 2 E H N - OB

- Series: Standard 2
- LENGTH OF UNIT
- # OF MOTORS
- E = ELECTRIC HEATED
- VOLTAGE CODE
- WATTAGE CODE
- COLOR

Sound Levels (measured at 10’ in an open field):

1 Motor Unit = 66 dBA, 2 Motor Unit = 68 dBA, 3 Motor Unit = 71 dBA, 4 Motor Unit = 73 dBA

MARS Air Systems, LLC certifies that the Air Curtains shown on this data sheet are licensed to bear the AMCA 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.

The AMCA Certified Ratings Seal applies to airflow rate, average outlet velocity, outlet velocity uniformity, velocity projection and power rating at free delivery only.

NOTE: Model STD260-2 is not AMCA-certified.

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Document No: ACC-IOM
Date: 04/13/2013

ACCESSORY INSTALLATION SUPPLEMENT

Door Limit and Magnetic Reed Switches

1. Mars door limit and magnetic reed switches are available with NEMA 1, 4X and 7 ratings. Contact the factory for additional ratings and details. (See FIG. 1 for typical single swing, hinged door type, door limit switch installation)

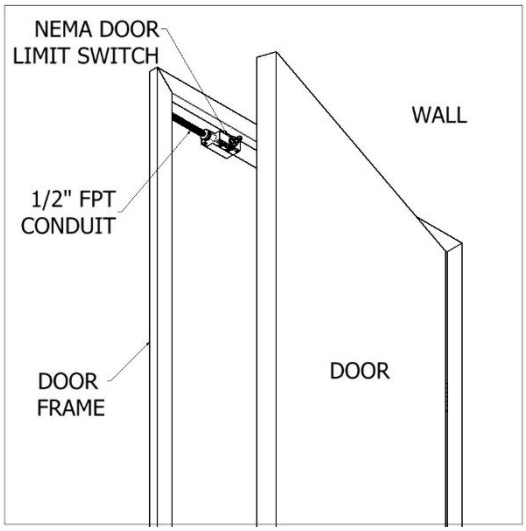

FIG. 1

2. Use light gauge materials when field fabricating brackets to activate and deactivate the door limit switch(s). (FIG. 2) Figure 2 also shows the typical installation of the combination plunger/roller type NEMA 1 door limit switch, for all non-hinged style doors.

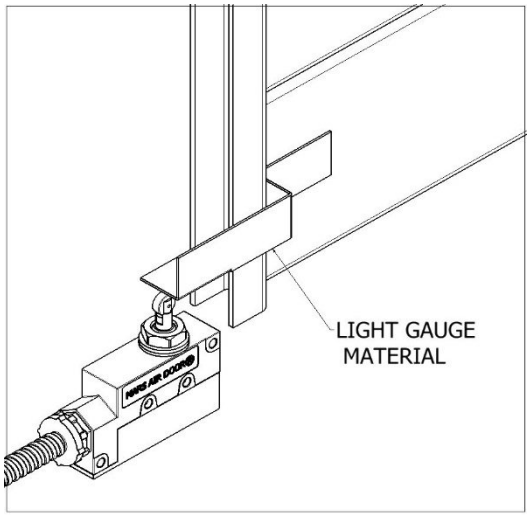

FIG. 2

3. All wiring must be per local and NEC (National Electric Code) codes.

4. Panels or controllers may be required. Refer to wiring diagram inside the control panel box.

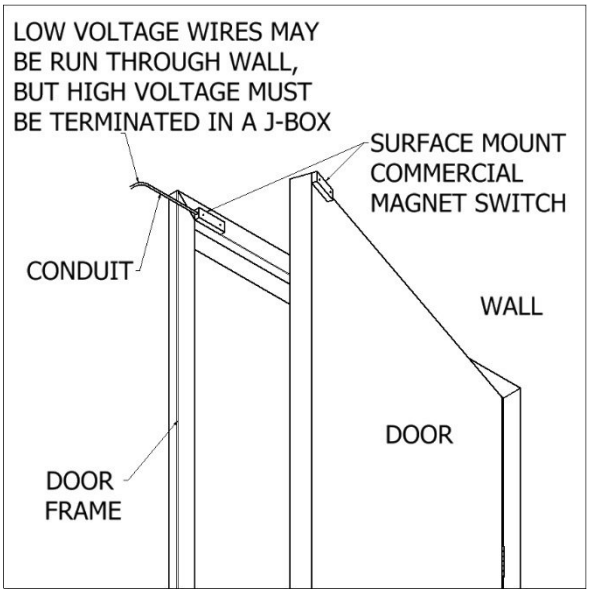

FIG. 3

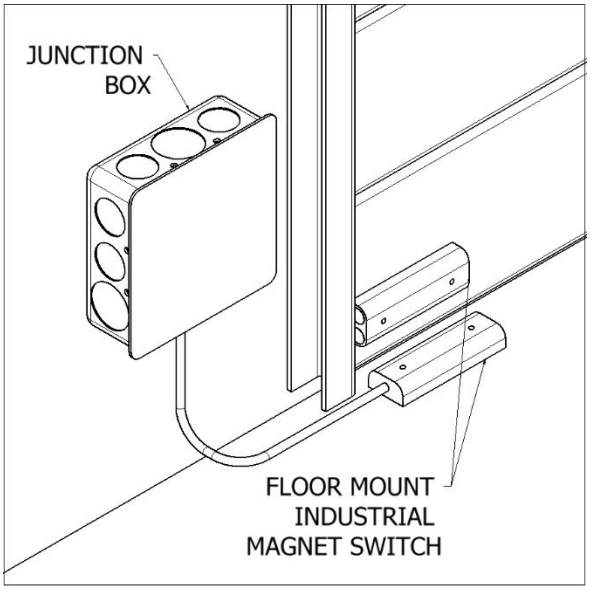

FIG. 4

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Bracket Installation

1. Side Extension Plates: For doorways wider than the air curtain, use combination of Side Extension Plates and Adjustable Mounting Brackets. (FIG. 5)

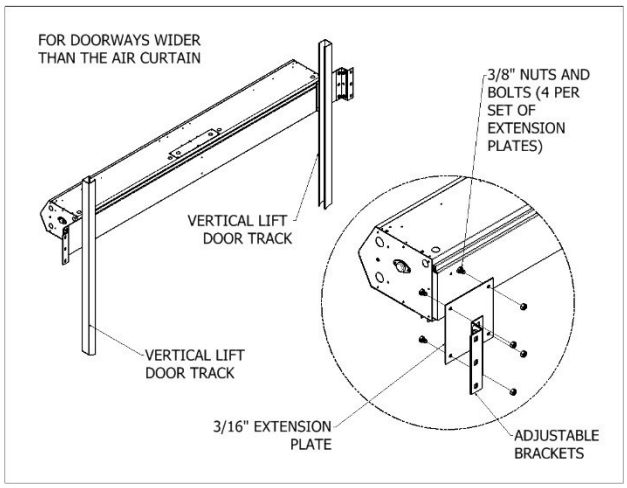

FIG. 5 (LPV SHOWN)

2. Adjustable Mounting Brackets: For installation of air curtain over drum-style roll-up door, use Extended Wall Mounting Brackets. (FIG. 6)

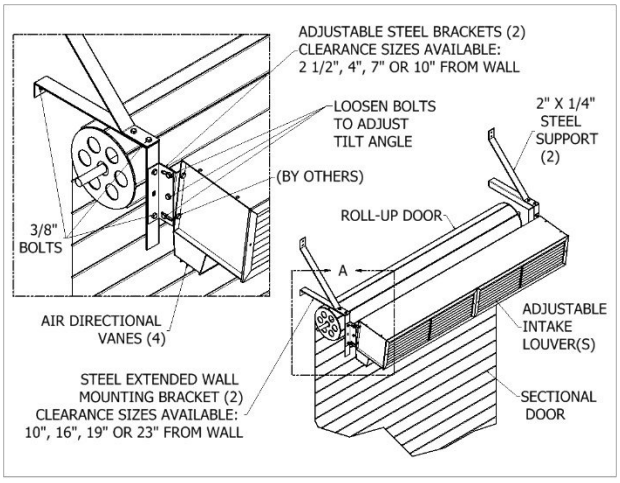

FIG. 6 (STD SHOWN)

3. Extended Wall Mounting: For Tandem Mounting of air curtain over sectional style door, use either wall mounting angle brackets or threaded rods.

4. Top Mounting Brackets: For overhead installation of units, use in conjunction with the threaded holes provided on top of unit.

Note: Angle brackets, threaded rods and I Beams are provided by others. (FIGS. 7 & 8) All optional brackets are not available for WMI/WMH and BD Series.

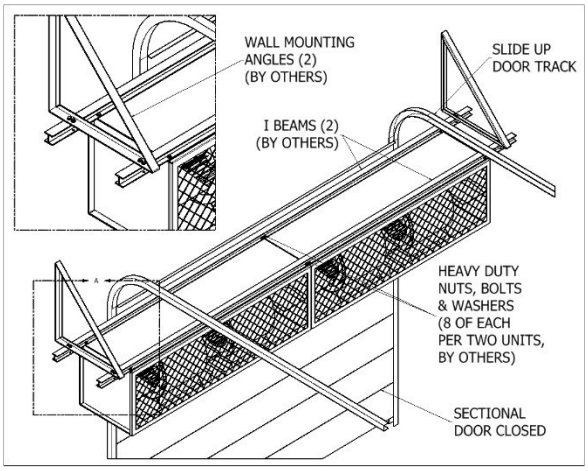

FIG. 7 (WMI/WMH Shown)

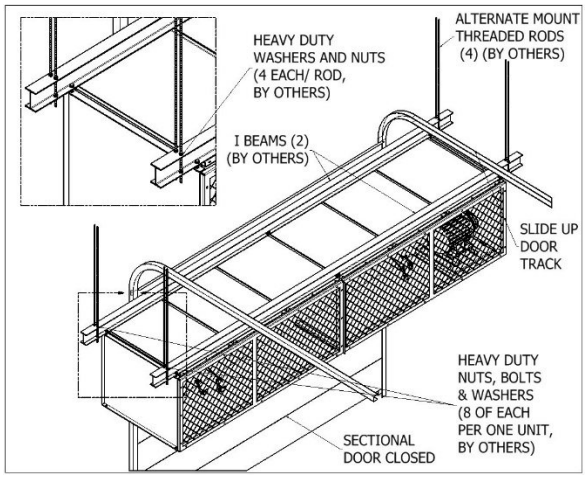

FIG. 8 (BD Shown)

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Fax: (310) 324-3030

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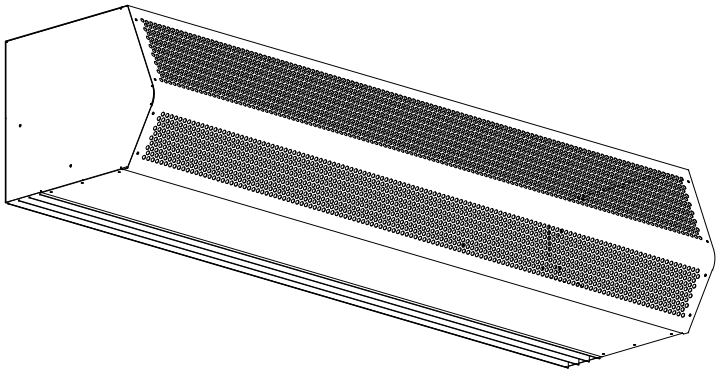
Document No: IND2-IOM
Date: 08/14/20

STANDARD 2 (STD2), HIGH VELOCITY 2 (HV2), EXTRA POWER 2 (EP2) AND ETL SANITATION CERTIFIED INDUSTRIAL SERIES

Installation, Operation and Maintenance Manual

Please read and save these instructions. Read carefully before attempting to assemble, install, operate, or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with these instructions could result in personal injury and/or property damage. Retain these instructions for future reference.

OVERVIEW



Mars Air Curtains are designed to cover door openings, providing both temperature control/environmental separation and flying insect control, when the building's doors are opened. Typical installation heights are: Standard 2 Series (Environmental Separation up to 12', Flying Insect Control up to 10'), High Velocity 2 Series (Environmental Separation up to 14', Flying Insect Control up to 12'), and Extra Power 2 Series (Environmental up to 16', Flying Insect Control up to 14'). All ETL Sanitation Certified Series should be mounted at 7' for Flying Insect Control. The units are typically wall mounted horizontally above the door opening. They can also be suspended from the ceiling or vertically mounted alongside the opening. The units are ETL Listed for either an inside or outside mount. Heated units must be mounted on the inside or the protected side of the opening. The motors used in the Standard 2, High Velocity 2 and Extra Power 2 Series are 1/2HP, 1HP and 3HP, respectively. The ETL Sanitation Series utilizes 1/2HP and 1HP motors.

The Standard 2, High Velocity 2 and Extra Power 2 Series come standard with an air intake grille. They can also be configured with an aluminum mesh air intake filter instead of the air intake grille or in conjunction with it.

WARNING

When servicing the product, motor may be hot enough to cause pain or injury. Allow motor to cool before servicing.

GENERAL SAFETY INFORMATION

Use this product only in the manner intended by the manufacturer. If you have any questions, contact the manufacturer. Only qualified personnel should install this product. Installing personnel should have a clear understanding of these instructions and should be aware of general safety precautions. Improper installation can result in electric shock, possible injury due to coming in contact with moving parts, as well as other potential hazards.

WARNING

To reduce the risk of fire, electric shock, or injury to persons, observe the following.

A. Always disconnect, lock and tag power source before installing or servicing product.
B. Installation work or electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
C. The combustion airflow needed for safe operation of fuel burning equipment in the area may be affected by the product's operation. Follow the heating equipment manufacturer's guideline and safety standards, such as those published by the National Fire Protection Agency (NFPA), the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) and local code authorities.
D. When cutting or drilling into a wall or ceiling, be careful not to damage electrical wiring and other hidden utilities.

WARNING

Precaution should be taken in explosive atmospheres.

RECEIVING AND INSPECTION

Upon receiving the product, check to make sure all items are accounted for by referencing the Bill of Lading to ensure all items were received. Inspect each carton for shipping damage before accepting delivery. Notify the freight carrier if any damage is noticed. The carrier will make notification on the delivery receipt acknowledging any damage to the product. All damage should be noted on all copies of the Bill of Lading which is countersigned by the delivering carrier. A Carrier Inspection Report should be filled out by the carrier upon arrival and a report given to the Traffic Department. If damaged upon arrival, file a claim immediately with the carrier. Any physical damage to the unit after acceptance is not the responsibility of Mars Air Systems.

UNPACKING

Verify that all parts, components and accessories, and the correct quantities of each have been received. If any items are missing, report shortages to Mars Air Systems directly to arrange for obtaining the missing items. Again, verify quantities received against those on the Bill of Lading only, as multiple shipments may be involved.

INSTALLATION

Typical Mounting – Wall or Ceiling Mounted Horizontally Above the Door Opening

1. Remove the air intake grille(s) and/or filter(s) from the product and set aside. Only products 48” or less, except HV2 and EP2 models, are shipped with the motor fan assembly (MFA) mounted inside.
2. Measure the housing and center it over the opening. The air curtain shall be equal to or greater than the width of the opening.
3. Total of two (2) key-hole slots and six (6) pre-punched mounting holes are provided for your convenience. The 7/16” pre-punched holes (4) provided, (2) on each end for top/celling mounts. The 1/2” key-hole slot and 7/16” pre-punched hole (2) provided, (2) on each end for wall mounts. These holes must be utilized to secure the product to the wall or ceiling. If necessary, holes may be drilled inside the product to align with the stud spacing. All hardware is field provided by others.
4. Mount the product such that the discharge is 1” above the opening and all obstacles. (FIG. 1)
   Note: If the product is installed higher than the recommended 1” above the opening, then it must be moved 3/8” away from the wall for every 1” that it is moved up. Any void between the wall and the product must be sealed, by others, to optimize performance.
5. Use four (4) threaded rods for overhead installation or four (4) threaded bolts for wall installation. All hardware is field provided by others. (FIG. 1)
6. If applicable, optional Adjustable Mounting Brackets, Side Extension Plates and Extended Wall Mounted Brackets are also available for installations over a Vertical Lift or Drum Roll-up type door. (Reference **Accessory Installation Supplement**)
7. If applicable, for tandem installation or products mounted side by side, allow no more than 6” between the two products. For overhead installation using threaded rods, the products may require a beam, by others, to span the full distance of the mounting length. (Reference **Accessory Installation Supplement**)
8. All wires must be connected internal of the unit and some knockouts are provided. However, it may be necessary to create your own knockout, as required.
9. The unit must be wired per NEC and local codes.

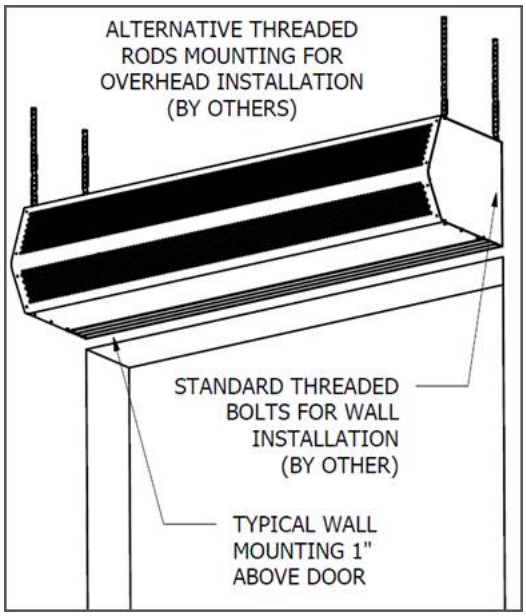


FIG. 1

Motor Fan Assembly Installation and Electrical Field Wiring

1. Once the housing is installed over the opening, the Motor Fan Assembly (MFA) must be re-placed and securely fastened. For products with the MFA shipped loose, wing nuts or hex nuts are provided inside the unit (FIG. 2). For heated MFA installation, reference **Heated Products Supplement Sheet**.
2. The unit and any optional accessories must be wired with the proper voltage to the junction box per the wiring diagram. (FIG. 3, unheated products only)
3. All 3 phase motors are bi-directional, which means they can rotate in either direction. Follow directional arrows on the blower wheel housings for proper rotation. If the motor is rotating incorrectly, switch two of the 3 phase

4. power or motor leads and the motor will rotate the opposite direction. Make sure all motors are turning in the same and proper direction. (FIG. 2)
5. Replace the air intake grille(s) or filter(s) once the product has been properly tested.

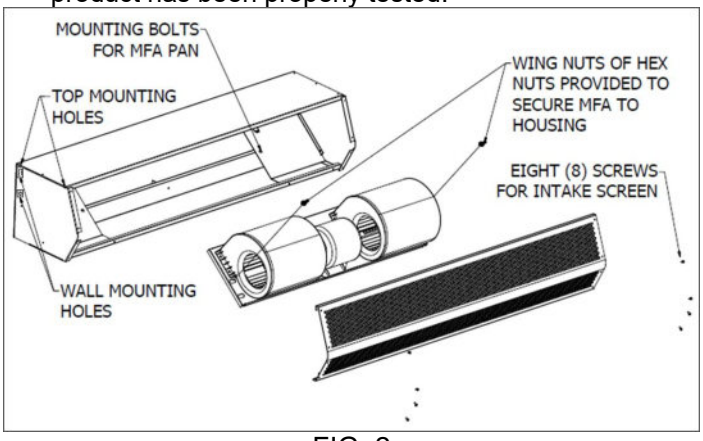


FIG. 2

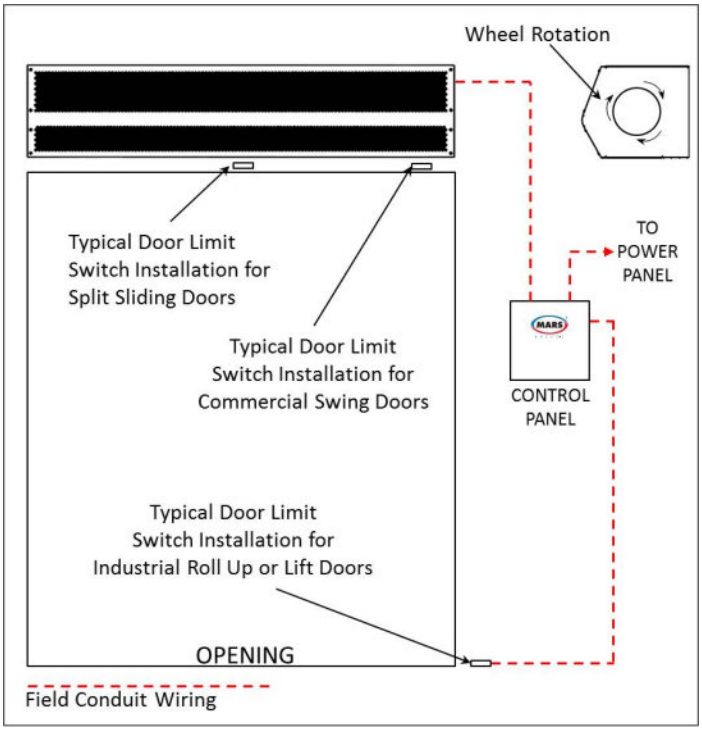


FIG. 3

NOTE

For accessory installation, reference Accessory Installation Supplement.

For heated products, reference Heated Products Supplement.

START-UP

This product has been assembled and tested at the factory prior to shipping. The following procedures should be performed to assure its performance. Before continuing with the start-up, it is important to recognize the safety controls furnished with the unit.

WARNING

The following items must all be completed by a qualified installer and checked off when completed

A. Re-check that the product has been installed properly and is level and secure.
B. Check all terminal screws are tight and field wiring is connected in accordance to National Electrical Code and wired per the enclosed wiring diagram. For electric heated models, ensure that the coils are secured and not touching each other on any metal surface.
C. Verify proper voltage prior to powering the product. (See product label for reference).
D. Check all field wired components “if supplied” are wired correctly.
E. Check that the inlet air supply and the discharge air supply are free of obstructions.
F. Check that all air filter(s) and/or air intake grille(s) are in place and installed properly, as originally shipped.
G. Verify voltage to the product once more and turn power on.
H. Regardless of whether the product is mounted on the inside or outside of the door opening, set the air directional vanes in the discharge nozzle slightly outward to approximately 10-15° towards the outside, or the wind load. (FIG. 4)

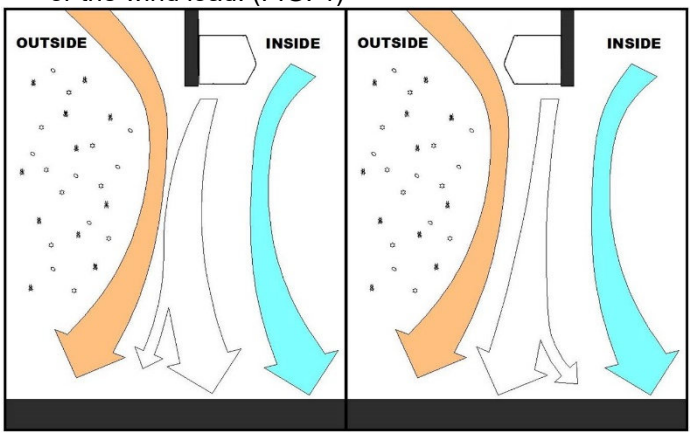


Fig. 4

I. For products with control panels, turn the HOA (Hand-On-Auto) selector switch to “On” position and open the door to energize the product. For products without a control panel or an On/Off switch, open the door to energize the product.
J. If heated products are installed, reference **Heated Products Supplement**.
K. For three phase units, verify direction of rotation of blower wheels (note direction arrows on the blower wheel housing). Correct if needed by changing polarity of three phase power.
L. **VERY IMPORTANT** Using a clamp meter, measure the amperage to each motor and ensure that they do not exceed the amperage listed on the product label.

M. If applicable, adjust the air intake grille(s) such that the output air stream reaches the floor. For temperature control and environmental separation applications, the air stream should reach the floor with sufficient strength to create an air seal around the door opening without creating turbulent mixing of the inside and outside air. For flying insect control applications, the air stream should reach the floor with maximum strength. If after proper installation and adjustment, the product appears to be producing too little or too much air for the application, contact the manufacturer.

MAINTENANCE

Routine maintenance is required to keep this product operating at its peak performance and efficiency. Over time, the housing, air intake grille, air intake filter, blower wheels and motor(s) will accumulate a buildup of dust, debris and other residue. It is imperative to keep these components clean. Failure to do so will not only lower operational efficiency and performance, but also reduce the useful life of the product. The time between cleanings depends on the application, location, and daily hours of use. On average, under normal use conditions, the product should require a thorough cleaning once every six (6) months.

⚠ WARNING

Prevent hazard of electrical shock. More than one disconnect switch may be required to de-energize this product.

⚠ WARNING

To reduce the risk of fire, electrical shock, or injury to persons, observe the following:

A. Maintenance is to be performed only by qualified personnel who are familiar with local codes and regulations and are experienced with this type of product.
B. Before servicing or cleaning the product switch power off at service panel and lock service panel to prevent power from being switched “ON” accidentally.

To clean the product, perform the following:

1. Verify the product has been disconnected from the power source.
2. Use a damp cloth and either a warm mild soapy water solution or bio-degradable degreaser, to wipe down the exterior components of the housing.
3. To access the interior of the product, remove the air intake grille and/or air intake filter. This is accomplished by removing the eight (8) self-tapping screws on the face of each air intake grille/filter.
4. Thoroughly clean the air intake grille/filter.
5. Remove the motor fan assembly (MFA) from inside the air curtain housing. This is accomplished by loosening the watertight fitting and pulling the cord out (3 phase power) or by the quick disconnect plug on the motor (1 phase power). Then remove the two (2) wing nuts on the out-board sides of the MFA pan. Care should be taken to avoid the MFA from tipping over.
6. Remove the MFA from the unit and thoroughly wipe down the motor, blower wheels and blower wheel housings. Be careful not to submerge the motor in water or spray it with a water hose.
7. The motor(s) require no additional lubrication. They are permanently lubricated and feature double sealed ball bearings.
8. To re-install the product, reverse the procedures above.
9. Reconnect the power source to the product
10. If you have any questions regarding the maintenance of the product, contact the manufacturer.

SPECIAL APPLICATIONS

Outdoor Installation

For outdoor unit special consideration may be required for enclosure, motor, wheel, and other components to minimize damage caused by exposure to the outdoor elements. Contact factory for special construction and costing.

Freezer and Cooler Installation

Air curtain must be mounted on the warm side for optimal performance. Variable Frequency Drive (VFD) is strongly recommended to control the air curtain air flow velocity at the floor level.

High humid areas may require de-humidifier or additional defrost cycle to minimize condensation and freezing for freezer applications. We recommend the air curtain unit to not replace doors but work in conjunction with door opening sequence cycle. Contact factory for details.

CAUTION

The appliance is not to be used by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction. Children are not to play with the appliance.

DISCLAIMER

Mars reserves the right to change specifications and product design without notice. Such revisions do not entitle the buyer to corresponding changes, improvements, additions, or replacements for previously purchased equipment.

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Document No: HT-IOM
Date: 10/20/2023

HEATED PRODUCTS SUPPLEMENT

NOTE

Before proceeding, refer to the unit's specific IOM Manual for safety, installation, and startup information. Verify proper voltage to the product per local and NEC codes. Ensure proper rotation for units with three phase motors.

Electric Heated Products

Electric heated products are certified only for indoor use. Electric heated products come standard with a thermostat (shipped loose, unless ordered as factory pre-mounted) which is to be field installed at eye level within 3 feet of the unit.

Note:

1. Electric heated Low Profile 2, Standard 2, High Velocity 2, Extra Power 2, and Phantom series units come standard with internally mounted controls with 24V control circuit (FIG. 1).
2. Wiring connection for the electric heated Low Profile 2 units is at the top of the housing which can be accessed by removing the top cover plate, while internal terminal blocks are provided for electric heated Standard 2, High Velocity 2, Extra Power 2, and Phantom series units.
3. Electric heated Wind Stopping and WindGuard units include an electric heater control panel mounted on the right-hand side, as standard. Optional motor/unit control panel available, which includes a remote 24-volt thermostat with On/Off switch with terminals provided.

The thermostat should be mounted close to the product to best sense the air temperature in the vicinity of the door opening. Connect proper voltage to the product per local and NEC codes.

Thermal overload protection is built into all heater coil assemblies. In the event of an overload condition, the overload will trip and disconnect electrical power from the heater coil. Upon diagnosing and fixing the problem, power can be reconnected to the heater coil by manually resetting the thermal overload by way of the buttons(s) or lever(s) located in the unit or panel.

To operate multiple units in conjunction using a single door switch and single thermostat, a primary/secondary configuration is required (FIG. 2).

For high ampacity units, additional holes can be drilled to bring in additional electrical wires. Use appropriate bushings for new holes to protect wire casing. High temperature silicon wires are recommended for main supply power.

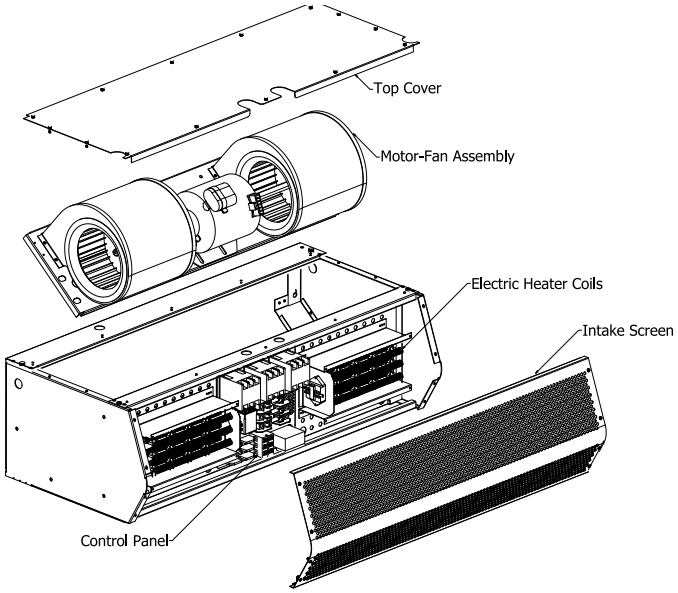

FIG. 1 (Electric Heated STD2 unit)

An unobstructed clearance space of 18-24" is required at the top of all heated air curtains to allow for service and optimal performance.

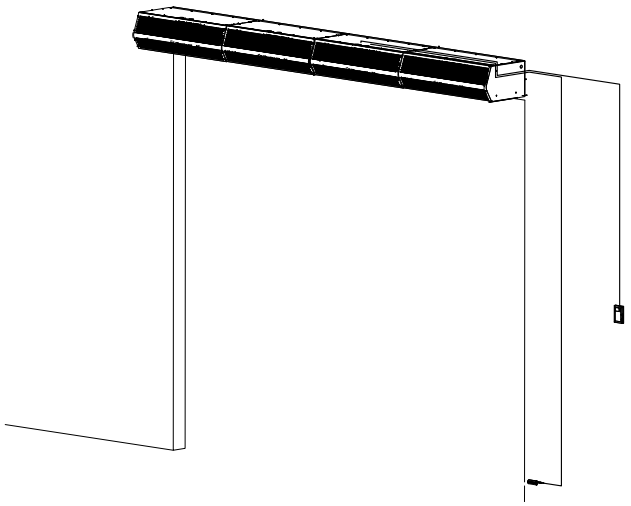

FIG. 2 (Tandem Mounted Primary/Secondary Units)

Hot Water and Steam Heated Products

Hot water and steam heated products are certified only for indoor use. Low Profile 2, Standard 2, High Velocity 2, Extra Power 2, and Phantom series units are shipped with coils mounted in the interior of the unit. Wind Stopping and WindGuard units are shipped with coils factory mounted to the exterior of the unit.

Once the coil has been secured to the cabinet, access to the motor and fan is through the removable access panels located on the top of the cabinet for Standard 2, High Velocity 2, Extra Power 2, Phantom series, and WindGuard units.

Note: Low Profile 2 and Wind Stopping units require the removal of the coil to access the motor(s) and/or fans.

All piping should be done by a licensed pipe fitter and in accordance with local codes and regulations. Connect the supply and return fittings as required. All traps and valves are to be sized and field installed by others. For Standard 2, High Velocity 2, and Extra Power 2 units, front intake screen must be removed to access vent plugs. Standard coil configuration is right hand supply and left-hand return (FIGS. 3 & 4) except for Low Profile 2 series, which has supply and return connection on the same end. Optional temperature controls, if ordered, are to be field installed by others.

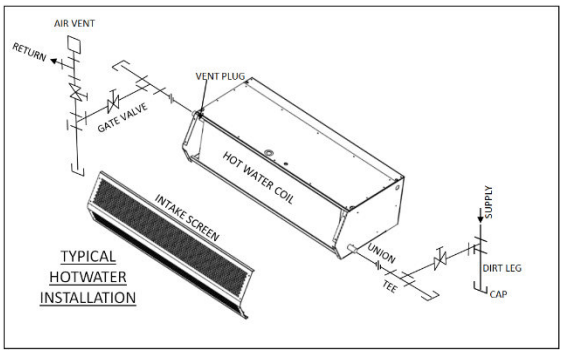

FIG. 3 (Hot Water Heated STD2 Unit)

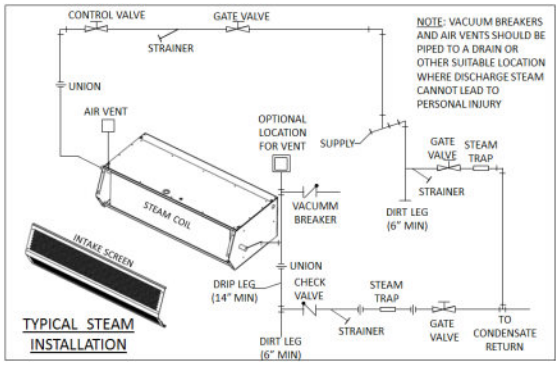

FIG. 4 (Steam Heated STD2 Unit)

14716 S. Broadway St., Gardena, CA 90248

(800) 421-1266 ● Fax: (310) 324-3030 ● www.marsair.com

TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
NO AIR BLOWING OUT OF DISCHARGE NOZZLE	- No power being supplied to the unit from the electrical power source	- Confirm power source / check if in on position
	- Circuit breaker is tripped	- Reset circuit breaker
	- Blown fuses on power supply	- Replace fuses
	- Motor overload is open or tripped	- Allow the motor to cool down; motor has auto reset internal overload; if unit is panel equipped, press reset button on overload inside panel, or replace motor overload if overload remains tripped
	- Motor contactor / relay defective (if applicable)	- Check voltage to coil; check contacts to see if they are pulling in
	- Failed switch	- Replace or repair limit switch
MOTOR IS RUNNING BUT FANS ARE NOT SPINNING	- Loose or broken coupling (belt drive)	- Replace or tighten coupling
	- Loose set screws on wheel hubs	- Tighten set screws on motor shaft flats
	- Fan spinning inside fan housing	- Tighten fan on shaft or replace fan
	- Broken fan hub	- Replace fan wheels
ELECTRICAL CONTROLS NOT WORKING WHEN DOOR IS OPEN	- Switch is in off position	- Turn unit's switch to the on position
	- Door limit switch is not operating	- Repair or replace door limit switch
UNIT WILL NOT TURN OFF	- Door limit switch is permanently closed or energized	- Position the door switch in a manner that turns off the unit when the door closes and turns on the unit when the door opens. Only light pressure required.
LOW AIR FLOW	- Discharge air vanes out of adjustment	- Adjust vanes to proper position (Refer to Start-Up Section in this manual)
	- Obstruction on intake or discharge	- Remove obstruction or move air curtain
	- Power leads out of polarity	- Switch power leads to correct polarity (3 phase models only)
	- Blower motor rotating below normal speed	- Apply proper voltage per unit requirement (see unit label) / Adjust adjustable motor speed knob (if applicable)
	- Fan rubbing against housing	- Free fan from housing
	- Blower wheels clogged with dirt	- Clean and remove dirt from blower wheels
EXCESSIVE AIR VELOCITY AT DOOR OPENING	- Nozzle out of adjustment and not angled far out enough (BD only)	- Adjust nozzle angle to outside
	- Air temperature too cold	- Add auxiliary heat to overcome wind chill
	- Air stream pushing air outside of the building	- Adjust discharge angle back into building
AIR NOT HITTING THE FLOOR	- Low air velocity	- Adjust vanes to proper position or check installation height (Refer to Start-Up Section in this manual)
	- Obstruction in the direction of air flow	- Remove obstruction or move air curtain (Move out 3/8" for every 1" up from the door)
	- Negative building pressure	- Provide a make-up air system to relieve negative building pressure
UNEVEN AIR	- Shaft rotating inside fan	- Replace fan or tighten fan on shaft
	- One motor not functioning	- Replace or repair motor
EXCESSIVE NOISE AND OR VIBRATION	- Loose or broken coupling (belt drive)	- Replace or tighten coupling
	- Loose set screws on wheel hubs	- Tighten set screws on motor shaft flats
	- Fan spinning inside fan housing	- Tighten fan on shaft or replace fan
	- Broken fan hub	- Replace fan wheels
	- Bearing end caps worn	- Replace Bearing end caps
	- Damaged blower wheel	- Replace Blower Wheel
	- Bearing end caps worn	- Replace Bearing end caps
	- Pillow block bearings make noise	- Grease Bearing
	- Balancing clips missing	- Replace Blower Wheel

TROUBLESHOOTING MOTOR

To determine if the motor is in good operating condition, compare measured motor resistance at the motor terminals to the values shown below.

MARS MOTOR RESISTANCE READINGS

Single Phase Motors

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Applicable Air Curtain Series	Mars Part #	Manufacturer Part #	Brand	Motor Rating	HP	Voltage	Phase	Capacitor Rating	Motor Frame	MOTOR WIRES OR TERMINAL (T) OHM READINGS HIGH SPEED (1750) Black Motor Wire & White Motor Wire	MEDIUM SPEED (1650) -	LOW SPEED (1450) -
LPV2, LPN2	03-001	7190-1682	Fasco	Nema 1	1/6	115	1	5 µF 370Vac	-	11.5	-	-
	03-002	7190-1903	Fasco	Nema 1	1/6	115	1	5 µF 370Vac	-	8.4	-	-
	03-003	7190-1825	Fasco	Nema 1	1/6	230	1	4 µF 440Vac	-	64	-	-
	03-004	7190-1904	Fasco	Nema 1	1/6	230	1	6 µF 370Vac	-	44.6	-	-
	03-124	7190-3307	Fasco	Nema 1	1/6	115/230	1	10 µF 370Vac	-	8.2/36	-	-
	03-124	K33NVDHJ-1446	US	Nema 1	1/6	115/230	1	10 µF 370Vac	-	8.1/32	-	-
Applicable Air Curtain Series	**Mars Part #**	**Manufacturer Part #**	**Brand**	**Motor Rating**	**HP**	**Voltage**	**Phase**	**Capacitor Rating**	**Motor Frame**	**White Motor Wire (T1) & Black Motor Wire (T3)**	**White Motor Wire (T1) & Black Motor Wire (T5)**	**White Motor Wire (T1) & Black Motor Wire (T2)**
STD2, N2, PH10, QP10	03-010	34G928X169	Baldor	Washdown (IP54)	1/2	115	1	-	56Z	1.2	-	-
	03-010	34G928X169	Baldor	Washdown (IP54)	1/2	208/230	1	-	56Z	4.6	-	-
	03-005	7124-1175	Genteq	Nema 1	1/2	115	1	7.5 µF 370Vac	48	2.6	3.8	5.2
	03-006	7124-1560	Genteq	Nema 1	1/2	208/230	1	10 µF 370Vac	48	9.9	15.9	22.5
	03-007	48S17T439	Marathon	Nema 1	1/2	277	1	-	48Z	7.7	-	-
	03-005	K055PWM1736C13H	Nidec	Nema 1	1/2	115	1	10 µF 370Vac	48Y	2.1	3.7	5.2
	03-005	K055PWM1736C13H	US	Nema 1	1/2	115	1	10 µF 370Vac	48Y	5.3	3.7	5.4
	03-006	K55HXPNA-2845	US	Nema 1	1/2	208/230	1	10 µF 370Vac	48Y	8.7	18.2	24.2
Applicable Air Curtain Series	**Mars Part #**	**Manufacturer Part #**	**Brand**	**Motor Rating**	**HP**	**Voltage**	**Phase**	**Capacitor Rating**	**Motor Frame**	**White Motor Wire (T1) & Black Motor Wire (T2)**	**White Motor Wire (T1) & Black Motor Wire (T3)**	**-**
HV2, NH2, PH12	03-021	35T276R025G1	Baldor	Washdown (IP54)	1	115	1	-	56Z	0.7	-	-
	03-015-Baldor	35M316S174	Baldor	Nema 1	1	115	1	-	56Z	0.6	-	-
	03-015-Baldor	35M316S174	Baldor	Nema 1	1	208/230	1	-	56Z	2.2	-	-
	03-021	35T276R025G1	Baldor	Washdown (IP54)	1	208/230	1	-	56Z	2.8	-	-
	03-014	7124-0985	Genteq	Nema 1	1	115	1	50 µF 370Vac	56	1.6	2.4	-
	03-015	7124-1096	Genteq	Nema 1	1	208/230	1	30 µF 370Vac	56	6.5	9.2	-
	03-015	-	Nidec	Nema 1	1	208/230	1	20 µF 370Vac	48Y	4.3	6.5	-
	03-014	K55BWJZB-2362	US	Nema 1	1	115	1	20 µF 370Vac	48Y	1	2.1	-
	03-015	-	US	Nema 1	1	208/230	1	20 µF 370Vac	48Y	3.2	6.3	-

Three Phase Motors

Applicable Air Curtain Series	Mars Part #	Manufacturer Part #	Brand	Motor Rating	HP	Voltage	Phase	Motor Frame	LEAD WIRE OHM READINGS Black Motor Wire (L1) & Red Motor Wire (L2)	Black Motor Wire (L1) & White Motor Wire (L3)	Red Motor Wire (L2) & White Motor Wire (L3)
STD2, N2, PH10, QP10	03-008	P55YYDHB-1527	US	Nema 1	1/2	208-230	3	48	16.1	16.1	16.1
	03-008	P55YYDHB-1527	US	Nema 1	1/2	460	3	48	63.6	63.6	63.6
	03-009	48T17T135	Marathon	Nema 1	1/2	575	3	48	136	136	136
HV2, NH2, PH12	03-017	56T17T5541	Marathon	Nema 1	1	208-230	3	56Z	4.3	4.3	4.3
	03-017	56T17T5541	Marathon	Nema 1	1	460	3	56Z	16.5	16.5	16.5
	03-018	56T17T5544	Marathon	Nema 1	1	575	3	56Z	26.6	26.6	26.6
	03-022	35N127S902	Baldor	Washdown (IP54)	1	208-230	3	56Z	5.1	5.1	5.1
	03-022	35N127S902	Baldor	Washdown (IP54)	1	460	3	56Z	19.8	19.8	19.8
EP2	03-026	165716	Century	Nema 1	3	208-230	3	U56Y	1.5	1.5	1.5
	03-026	165716	Century	Nema 1	3	460	3	U56Y	5.7	5.7	5.7
	03-026	P63TYFMJ-1687	US	Nema 1	3	208-230	3	56HZ	1.2	1.2	1.2
	03-026	P63TYFMJ-1687	US	Nema 1	3	460	3	56HZ	4.4	4.4	4.4
	03-028	35E92Y26	Baldor	Nema 1	3	575	3	56Z	9.2	9.2	9.2
WMI	03-110	36H110-2211G1	Baldor	Nema 1	1,2,3	208-230	3	184Z	3.5	3.5	3.5
	03-110	36H110-2211G1	Baldor	Nema 1	1,2,3	460	3	184Z	13.5	13.5	13.5
WMH	03-055	37F932W828G1	Baldor	Nema 1	5	230	3	215YZ	0.7	0.7	0.7
	03-055	37F932W828G1	Baldor	Nema 1	5	460	3	215YZ	2.4	2.4	2.4
	03-046	37F909X889G1	Baldor	Nema 1	7	230	3	215YZ	0.6	0.6	0.6
	03-046	37F909X889G1	Baldor	Nema 1	7	460	3	215YZ	1.6	1.6	1.6
BD	03-033	U639A - 215TTFC6027	Marathon	Nema 1	10	208-230	3	215T	0.4	0.4	0.4
	03-033	U639A - 215TTFC6027	Marathon	Nema 1	10	460	3	215T	1.2	1.2	1.2
	03-074	GT1128A 170118.60	Marathon	Nema 1	25	575	3	284TS	0.5	0.5	0.5

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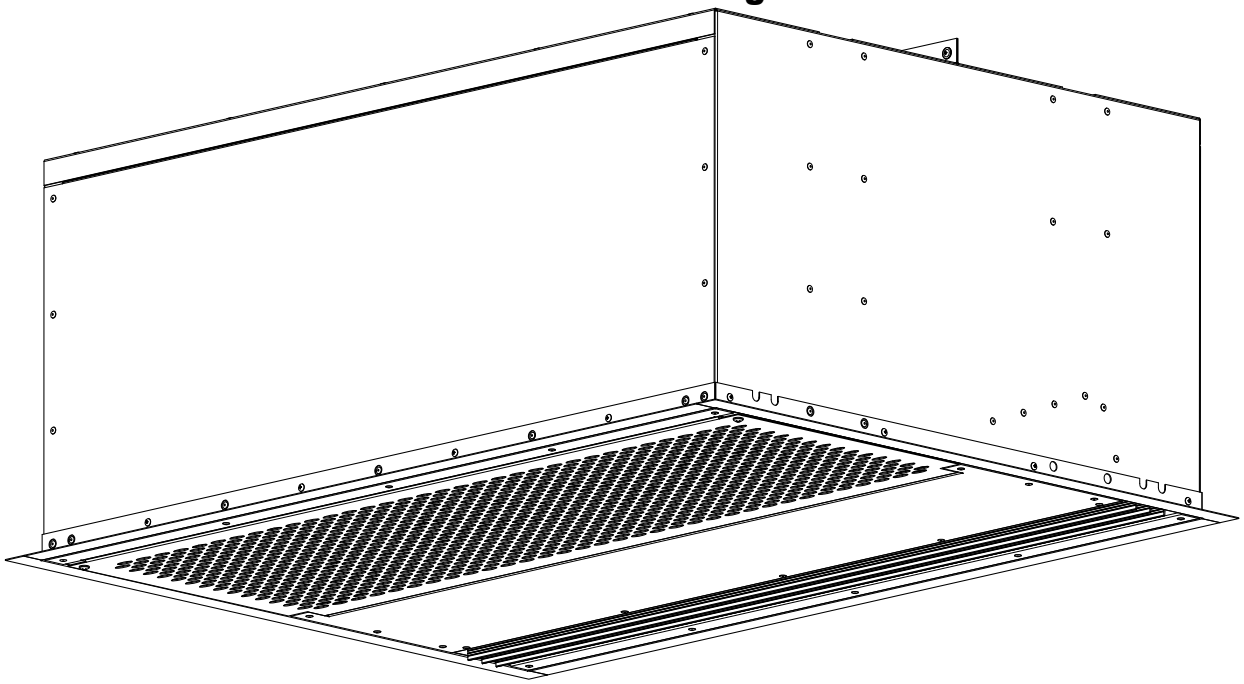
PH10 Electric Heated Series

Phantom 10 Series
Air Curtain
Submittal Package



Submitted by:
Mars Air Systems, LLC
14716 S. Broadway
Gardena, CA 90248

Project Name	Amazon LIT3
P.O.#	
S.Q.	
Company	
Print Name	
Signature	
Date	

(Electronic Signature Preferred)

Company Seal or Stamp

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Table of Contents

PH10 (Phantom 10) Series

RAC-1 thru RAC-4
PH1036-1EEH-PW

Electric Heated
Model Lengths: 36”–144”
Environmental Separation (up to 12’)
Insect Control (up to 10’)

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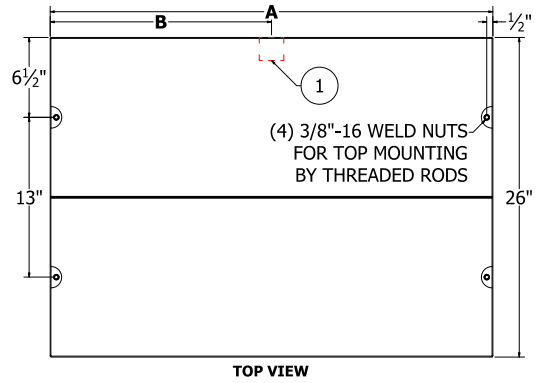
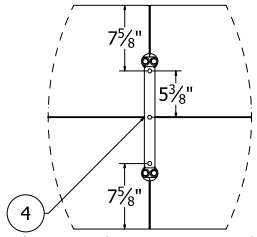
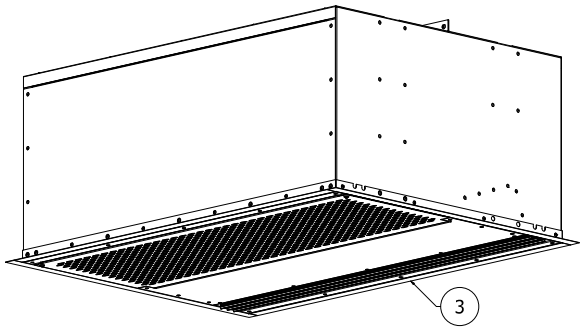
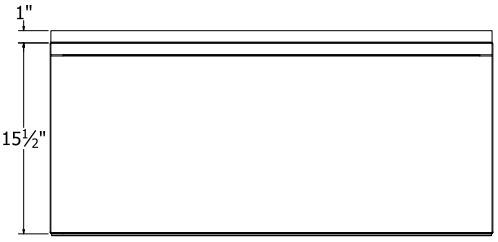


TOP VIEW

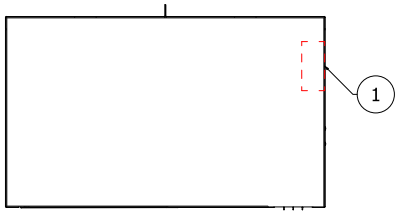


TOP VIEW - CENTER TANDEM MOUNT
(FOR UNITS LONGER THAN 72")





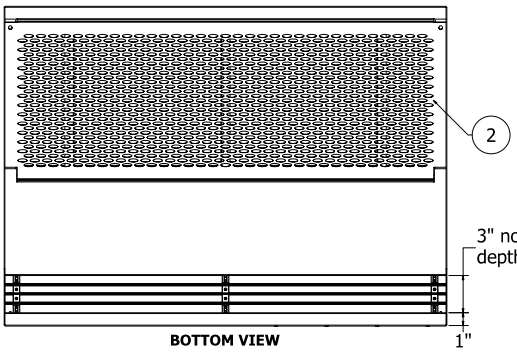
FRONT VIEW



SIDE VIEW

AIR INTAKE

AIR DISCHARGE



BOTTOM VIEW

Notes:

1. Internal junction box (j-box) provided for electrical wiring.
2. Cleanable polyester filters are installed standard. Optional washable aluminum or pleated paper filters are also available.
3. (4) 1” wide matching trim pieces are included and shipped loose for optional installation.
4. Units up to 72” in width can be suspended from both ends without intermediate support. Longer units are double units and must be supported in the center.
5. Recommended service clearances are 2” to the left and right sides and 18” on top of the unit.
6. Circuit protection (per NEC) to be installed by others.
7. To prevent accidental damage during operation, unit must be installed so that the bottom of the air curtain does not extend below the door header.

Model Number	Mechanical Data					AMCA Certified Lab Data				
	Overall Length A (in)	Nozzle Length (in)	J-box Distance from Each Edge B (in)	Motor (hp)	Weight (lb)	Max Core Velocity at Nozzle (in)	Avg Velocity (fpm)	Volume (cfm)	Uniformity (%)	Power Rating (watt)
☑ PH1036-1E**-PW	36	36	18	½	65	3500	1623	1217	86	455
☐ PH1042-1E**-PW	42	42	21	½	70	4500	1642	1437	82	462
☐ PH1048-1E**-PW	48	48	24	½	75	3400	1383	1383	93	467
☐ PH1072-2E**-PW	72	72	36	(2) ½	120	3500	1623	2434	86	910
☐ PH1084-2E**-PW	84	84	(2) 21	(2) ½	140	4500	1642	2874	82	924
☐ PH1096-2E**-PW	96	96	(2) 24	(2) ½	145	3400	1383	2766	93	934
☐ PH10108-3E**-PW	108	108	(2) 18	(3) ½	195	3500	1623	3651	86	1365
☐ PH10144-4E**-PW	144	144	(2) 36	(4) ½	260	3500	1623	4868	86	1820
The following models are not licensed to bear the AMCA seal										
☐ PH1060-2E**-PW	60	60	30	(2) ½	115	4400	1887	2359	93	899
☐ PH10120-4E**-PW	120	120	(2) 30	(4) ½	230	4400	1887	4719	93	1797

*** – Use corresponding letters in “Electrical Data” column headers (see page 2) to complete the model numbers.**

Note: above data is for 60 Hz at 1725 RPM. For 50 Hz, RPM is 1425 with a 17% reduction in performance.

- *The AMCA Certified Ratings Seal applies to airflow rate, average outlet velocity, outlet velocity uniformity, velocity project, and power rating at free delivery only.*

PH10 (Phantom 10) Series

RAC-1 thru RAC-4
PH1036-1EEH-PW

Electric Heated
Model Lengths: 36”–144”
Environmental Separation (up to 12’)
Insect Control (up to 10’)

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Standard Features:

Air curtain

- ETL-certified to conform to UL 2021 (US) and CSA 22.2 (Canada) standards for indoor use
- AMCA-certified to AMCA 211 (includes performance testing per AMCA 220)
  - Certified models are approved for use as alternate to vestibules (per ASHRAE 90.1, IECC, and IgCC)
- Sleek self-contained one-piece heavy-gauge corrosion-proof paint lock metal design
- Rust preventative electrostatic polyurethane powder coating
  - Standard color is Pearl White (PW)
- ½ HP continuous duty Totally Enclosed Air Over (TEAO) motors (NEMA 1)
- Adjustable air directional vanes with 40° sweep front to back
- 18-month parts warranty
- Freight included (FOB continental USA)
- Proudly made in the USA

Electric heater coil and wiring

- Coils are open type (for rapid temperature rise) and are located directly in the air curtain’s intake air stream
- Manual reset thermal overload protection provided
- Control voltage is 24V
- Controls are internally mounted and prewired to receive power connection – accessible through the bottom intake or top access panels
- 24-volt thermostat with “heat/off/fan” capability is shipped loose for field installation
  - Not applicable for units with SimpleLink

Three Phase Electrical Data Full Load Amp (FLA)	Unit Voltage (Voltage Code) 208V/3Ø ☑ (E)	230V/3Ø ☐ (F)	460V/3Ø ☐ (H)	Heater Kilowatts (Wattage Code) (H)	(N)	(S)	(T)	Temp Rise °F
☑ PH1036-1E**-PW	36.5	33.5	16.8	12	-	-	-	31
☐ PH1042-1E**-PW	36.5	33.5	16.8	12	-	-	-	26
☐ PH1048-1E**-PW	36.5	33.5	16.8	12	-	-	-	27
☐ PH1060-2E**-PW	72	66	32.6	-	24	-	-	36
☐ PH1072-2E**-PW	72	66	32.6	-	24	-	-	31
☐ PH1084-2E**-PW	72	66	32.6	-	24	-	-	26
☐ PH1096-2E**-PW	72	66	32.6	-	24	-	-	27
☐ PH10108-3E**-PW	107.5	98.5	48.4	-	-	36	-	31
☐ PH10120-4E**-PW	144	131	64.2	-	-	-	48	36
☐ PH10144-4E**-PW	144	131	64.2	-	-	-	48	31

* - Use corresponding letters in “Voltage Code” and “Wattage Code” column headers to complete the model numbers.

Ampacity (MCA) = total FLA x 1.25

Amps per motor (included in values above):
2.5A @ 208-230V/1Ø; 1.8A @ 208V/3Ø; 1.6A @ 230/3Ø; 0.8A @ 460V/3Ø

Single Phase Electrical Data Full Load Amp (FLA)	Unit Amperage (Voltage Code) 208V/1Ø ☐ (B)	230V/1Ø ☐ (C)	Heater Kilowatts (Wattage Code) (B)	(H)	(K)	(N)	Temp Rise °F
☐ PH1036-1E**-PW	31.5	29.5	6	-	-	-	16
☐ PH1042-1E**-PW	31.5	29.5	6	-	-	-	13
☐ PH1048-1E**-PW	31.5	29.5	6	-	-	-	14
☐ PH1060-2E**-PW	63	58	-	12	-	-	18
☐ PH1072-2E**-PW	63	58	-	12	-	-	16
☐ PH1084-2E**-PW	63	58	-	12	-	-	13
☐ PH1096-2E**-PW	63	58	-	12	-	-	14
☐ PH10108-3E**-PW	94.5	86.5	-	-	18	-	16
☐ PH10120-4E**-PW	126	115	-	-	-	24	18
☐ PH10144-4E**-PW	126	115	-	-	-	24	16

* - Use corresponding letters in “Voltage Code” and “Wattage Code” column headers to complete the model numbers.

Ampacity (MCA) = total FLA x 1.25

Amps per motor (included in values above): 2.5A @ 208-230V/1Ø

Mars Recommended Accessories (see catalog for complete listing):

- Door Limit Switches (§) 99-125 Door Switch
  - ☐ 99-018, Commercial surface mounted magnetic switch, 24V
- Controllers
  - ☐ SK-EU, SimpleLink, 208-575V (460-575V, 3PH needs additional 115-230V, 1PH power), Integral Control, NEMA1
- Factory Mounted Control Options
  - ☑ INS-TD, Adjustable time delay (1 sec to 17 min)
  - ☐ INS-HD, Heat on demand
  - ☐ INS-2S, Unit mounted 2 speed switch (460-575V, 3PH needs additional 115V-230V, 1PH power)
  - ☑ BMS-300, BMS for monitor and control
  - *Note: dry contact provided in panel for monitoring motor and heater. 24Vac signal provided from panel for controlling motor and heater*
- Disconnects (§)
  - ☐ 99-122 & 99-123, Non-Fused Disconnect, remote mounted, 600V, 32A & 80A respectively, 3 Pole, IP65
  - ☑ 99-***-**, Fused Disconnect, remote mounted, 240V-600V, 30A-100A, 3 Pole, NEMA3R (see disconnect submittals for complete part numbers)

(§) = Shipped loose 99-145 Disconnect

AMCA Certified Projection Velocity		
Model	Distance from Nozzle (in)	Average Core Velocity (fpm)
PH1036-1E*	40	961
	80	840
	120	772
	160	714

EXAMPLE

PH10 72 - 2 E H N - PW

- PH10 — SERIES: PHANTOM 10
- 72 — LENGTH OF UNIT
- 2 — # OF MOTORS
- E — E = ELECTRIC HEATED
- H — VOLTAGE CODE
- N — WATTAGE CODE
- PW — COLOR

Sound Levels (measured at 10’ in a free field):

1 Motor Unit = 66 dBA, 2 Motor Unit = 68 dBA, 3 Motor Unit = 71 dBA, 4 Motor Unit = 73 dBA

MARS Air Systems, LLC certifies that the Air Curtains shown on this data sheet are licensed to bear the AMCA 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.
The AMCA Certified Ratings Seal applies to airflow rate, average outlet velocity, outlet velocity uniformity, velocity projection and power rating at free delivery only.
NOTE: Models PH1060-2 and PH10120-4 are not AMCA-certified.

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Document No: ACC-IOM
Date: 04/13/2013

ACCESSORY INSTALLATION SUPPLEMENT

Door Limit and Magnetic Reed Switches

1. Mars door limit and magnetic reed switches are available with NEMA 1, 4X and 7 ratings. Contact the factory for additional ratings and details. (See FIG. 1 for typical single swing, hinged door type, door limit switch installation)

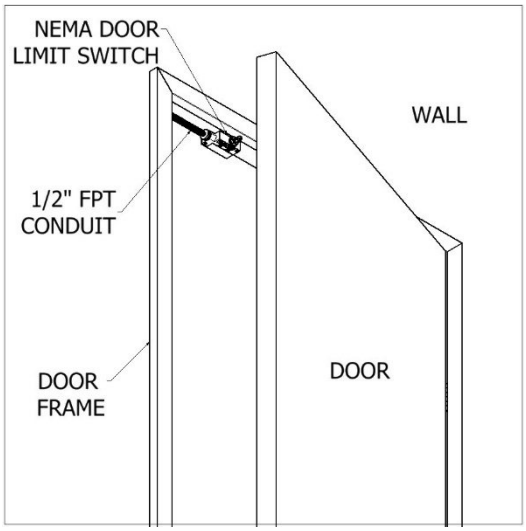

FIG. 1

2. Use light gauge materials when field fabricating brackets to activate and deactivate the door limit switch(s). (FIG. 2) Figure 2 also shows the typical installation of the combination plunger/roller type NEMA 1 door limit switch, for all non-hinged style doors.

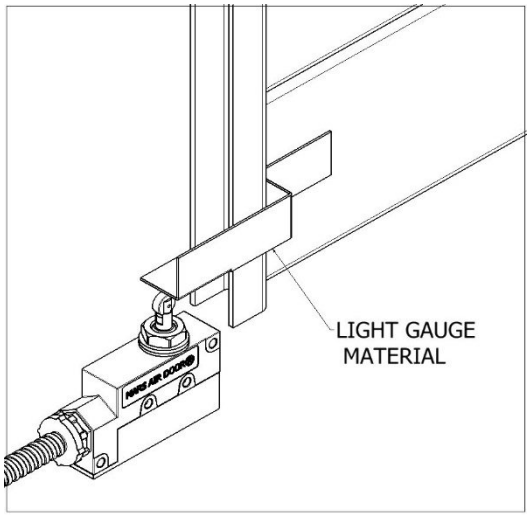

FIG. 2

3. All wiring must be per local and NEC (National Electric Code) codes.

4. Panels or controllers may be required. Refer to wiring diagram inside the control panel box.

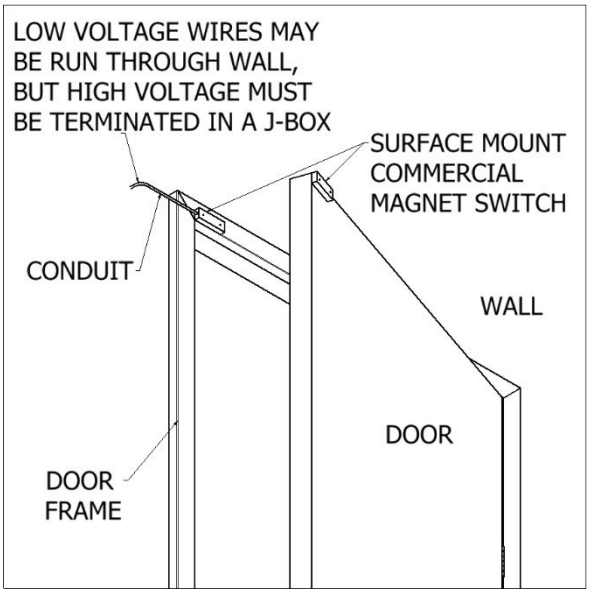

FIG. 3

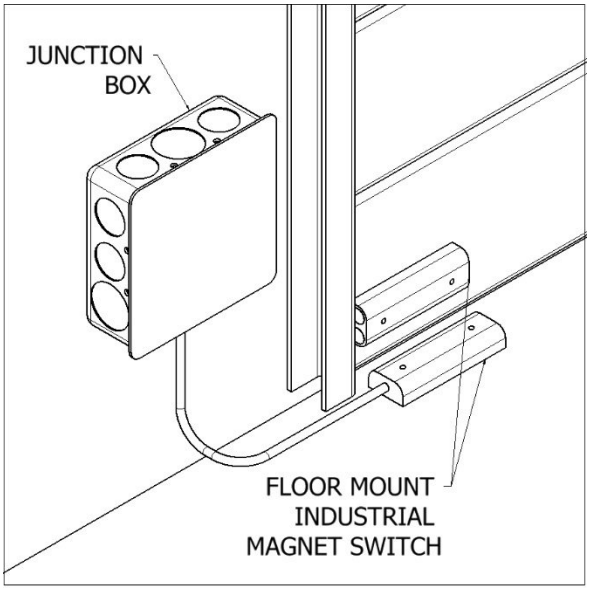

FIG. 4

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Bracket Installation

1. Side Extension Plates: For doorways wider than the air curtain, use combination of Side Extension Plates and Adjustable Mounting Brackets. (FIG. 5)

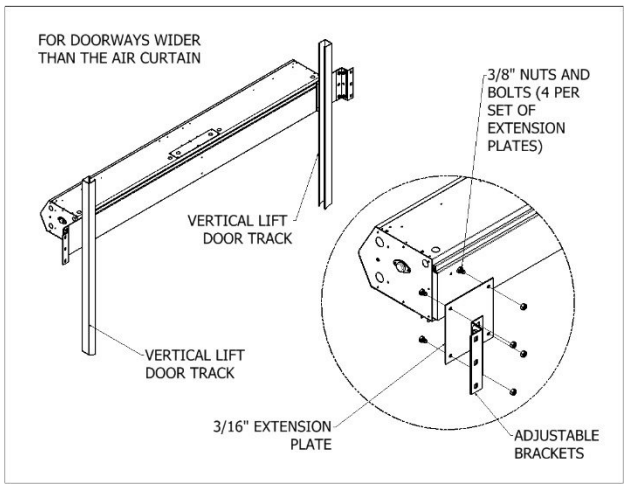

FIG. 5 (LPV SHOWN)

2. Adjustable Mounting Brackets: For installation of air curtain over drum-style roll-up door, use Extended Wall Mounting Brackets. (FIG. 6)

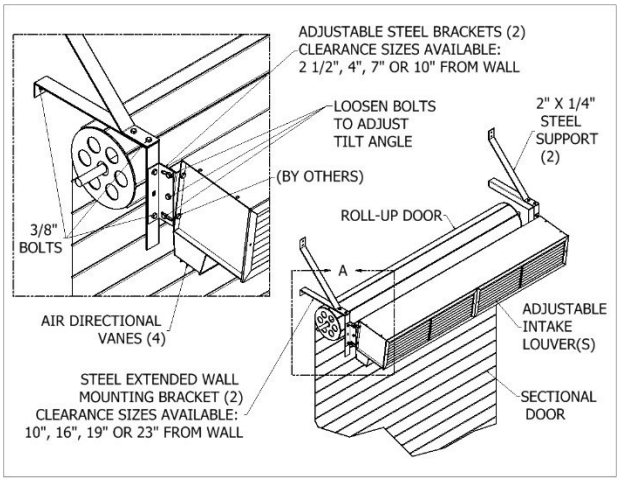

FIG. 6 (STD SHOWN)

3. Extended Wall Mounting: For Tandem Mounting of air curtain over sectional style door, use either wall mounting angle brackets or threaded rods.

4. Top Mounting Brackets: For overhead installation of units, use in conjunction with the threaded holes provided on top of unit.

Note: Angle brackets, threaded rods and I Beams are provided by others. (FIGS. 7 & 8) All optional brackets are not available for WMI/WMH and BD Series.

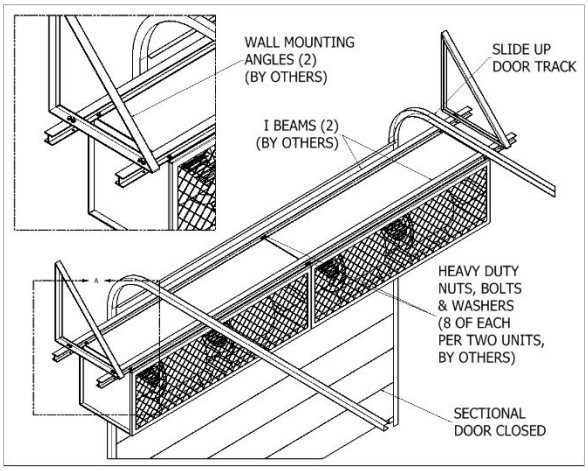

FIG. 7 (WMI/WMH Shown)

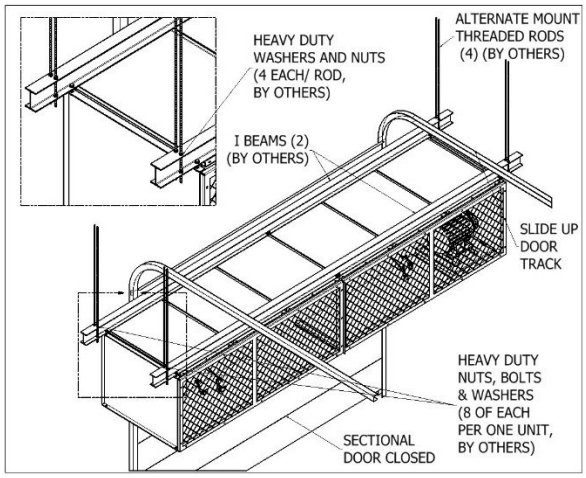

FIG. 8 (BD Shown)

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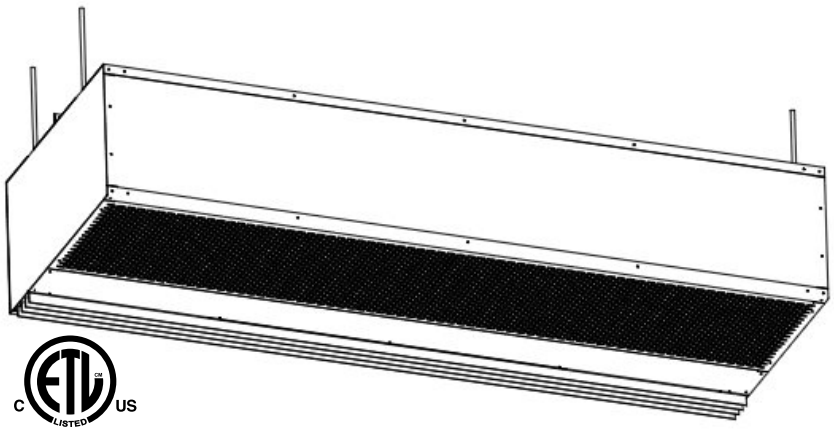
Document No: ICM-IOM
Date: 08/24/20

PHANTOM (PH10 and PH12) COMMERCIAL AND INDUSTRIAL SERIES

Installation, Operation and Maintenance Manual

Please read and save these instructions. Read carefully before attempting to assemble, install, operate, or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with these instructions could result in personal injury and/or property damage. Retain these instructions for future reference.

OVERVIEW



Mars Air Curtains are designed to cover door openings, providing both temperature control/ environmental separation and flying insect control, when the building's doors are opened. Typical installation heights are: Phantom 10 Series (Environmental Separation up to 12' / Flying Insect Control up to 10'), and Phantom 12 Series (Environmental Separation up to 16' / Flying Insect Control up to 14'). The units are typically suspended from the ceiling and hidden inside the false roof. They can also be wall mounted using special brackets. The units are ETL Listed, Canada and US, for either an inside or outside mount. Heated units must be mounted on the inside or the protected side of the opening. The motors used in the Phantom 10 and Phantom 12 series are 1/2 HP and 1 HP, respectively.

The Phantom Series come standard with an air intake screen(s).

WARNING

When servicing the product, motor may be hot enough to cause pain or injury. Allow motor to cool before servicing.

GENERAL SAFETY INFORMATION

Use this product only in the manner intended by the manufacturer. If you have any questions, contact the manufacturer. Only qualified personnel should install this product. Installing personnel should have a clear understanding of these instructions and should be aware of general safety precautions. Improper installation can result in electric shock, possible injury due to coming in contact with moving parts, as well as other potential hazards.

WARNING

To reduce the risk of fire, electric shock, or injury to persons, observe the following.

A. Always disconnect, lock and tag power source before installing or servicing product.
B. Installation work or electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
C. The combustion airflow needed for safe operation of fuel burning equipment in the area may be affected by the product's operation. Follow the heating equipment manufacturer's guideline and safety standards, such as those published by the National Fire Protection Agency (NFPA), the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) and local code authorities.
D. When cutting or drilling into a wall or ceiling, be careful not to damage electrical wiring and other hidden utilities.

WARNING

Precaution should be taken in explosive atmospheres.

RECEIVING AND INSPECTION

Upon receiving the product, check to make sure all items are accounted for by referencing the Bill of Lading to ensure all items were received. Inspect each carton for shipping damage before accepting delivery. Notify the freight carrier if any damage is noticed. The carrier will make notification on the delivery receipt acknowledging any damage to the product. All damage should be noted on all copies of the Bill of Lading which is countersigned by the delivering carrier. A Carrier Inspection Report should be filled out by the carrier upon arrival and a report given to the Traffic Department. If damaged upon arrival, file a claim immediately with the carrier. Any physical damage to the unit after acceptance is not the responsibility of Mars Air Systems.

UNPACKING

Verify that all parts, components and accessories, and the correct quantities of each have been received. If any items are missing, report shortages to Mars Air Systems directly to arrange for obtaining the missing items. Again, verify quantities received against those on the Bill of Lading only, as multiple shipments may be involved.

INSTALLATION

Typical Mounting – Wall or Ceiling Mounted Horizontally Above the Door Opening

1. Gently remove all packaging materials, hardware, and all other accessories from interior of unit prior to operating. Severe unit damage will occur if these items are not removed prior to operation.
2. The intake screen can be opened by removing the two screws on the bottom of the unit. The screen can be removed from the unit by pulling the spring-loaded piano hinges. (FIG. 1)
3. All Phantom series have the Motor Fan Assembly (MFA) shipped internally mounted.
4. All units are equipped with (4) 3/8'' threaded inserts on top for overhead installation (FIG. 2)
5. Determine the exact mounting locations to suspend the unit above the ceiling so that the unit is centered and parallel with the door opening. Use (4) threaded rods to suspend the enclosure to the ceiling.
   Note: When installed in the ceiling above the door, the air curtain must be moved 3/8" away from the wall for every 1" above the door height.
6. If applicable, extended wall mounting brackets are available for attaching the unit to a wall.
7. If applicable, for tandem installation (units longer than 72") of products mounted side by side, allow no more than 6" between the two units. Note that (4) sets of threaded rods are used to suspend each unit to the ceiling or center mounting brackets are to be used for joining and top mounting tandem units.
8. Mount the product such that the discharge is flush with the ceiling.
9. All wires must be connected internal of the unit and some knockouts are provided. However, it may be necessary to create your own knockout, as required.
10. The unit must be wired per NEC and local codes.

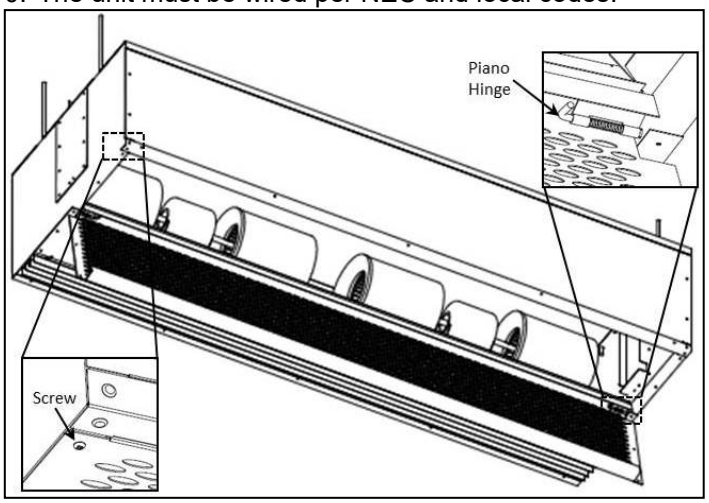


FIG 1

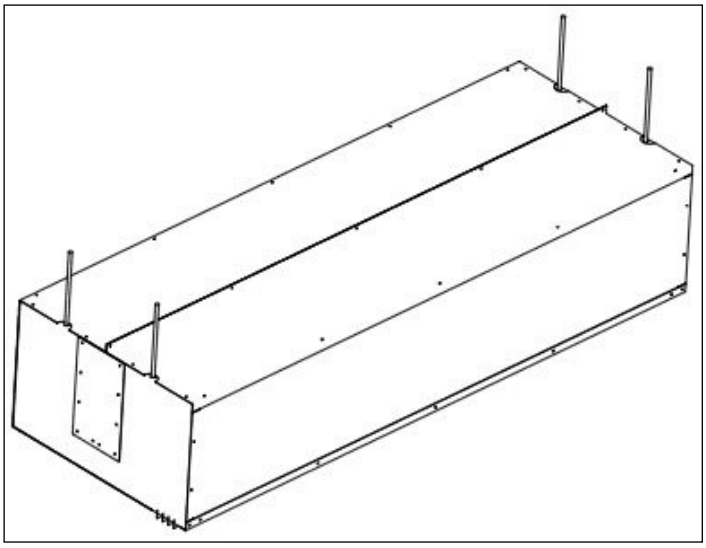


FIG. 2

Electrical Field Wiring

1. For electric models, reference the **Heated Products Supplement**.
2. The unit and any optional accessories must be wired with the proper voltage to the junction box per the wiring diagram. (FIG. 3, unheated products only)
3. All 3 phase motors are bi-directional, which means they can rotate in either direction. Follow directional arrows on the blower wheel housings for proper rotation. If the motor is rotating incorrectly, switch two of the 3 phase power or motor leads and the motor will rotate the opposite direction. Make sure all motors are turning in the same and proper direction. (FIG. 3)

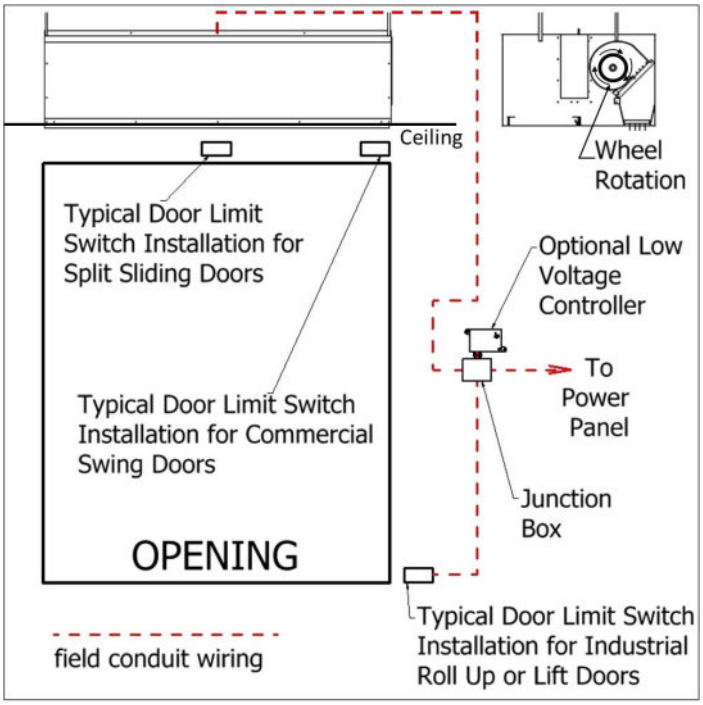


FIG. 3

NOTE

For accessory installation, reference Accessory Installation Supplement.

For heated products, reference Heated Products Supplement.

START-UP

This product has been assembled and tested at the factory prior to shipping. The following procedures should be performed to assure its performance. Before continuing with the start-up, it is important to recognize the safety controls furnished with the unit.

WARNING

Prevent hazard of electrical shock. More than one disconnect switch may be required to de-energize this product.

WARNING

The following items must all be completed by a qualified installer and checked off when completed

A. Re-check that the product has been installed properly and is level and secure.
B. Check all terminal screws are tight and field wiring is connected in accordance to National Electrical Code and wired per the enclosed wiring diagram. For electric heated models, ensure that the coils are secured and not touching each other on any metal surface.
C. Verify proper voltage prior to powering the product. (See product label for reference).
D. Check all field wired components “if supplied” are wired correctly.
E. Check that the inlet air supply and the discharge air supply are free of obstructions.
F. Check that all air filter(s) and/or air intake grille(s) are in place and installed properly, as originally shipped.
G. Verify voltage to the product once more and turn power on.
H. Regardless of whether the product is mounted on the inside or outside of the door opening, set the air directional vanes in the discharge nozzle slightly outward to approximately 10-15° towards the outside, or the wind load. (FIG. 4).

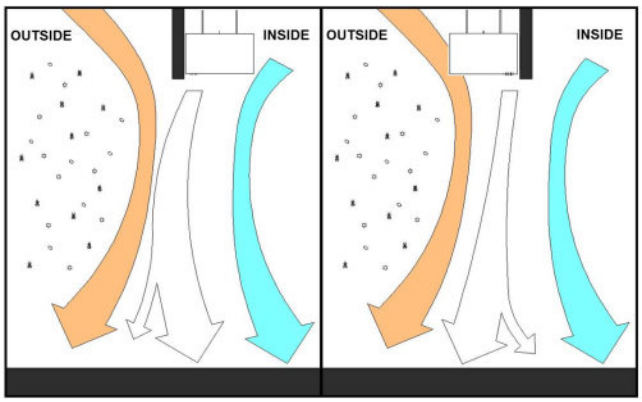


FIG. 4

I. For products with control panels, turn the HOA (Hand-On-Auto) selector switch to “On” position and open the door to energize the product. For products without a control panel or an On/Off switch, open the door to energize the product.
J. If heated products are installed, reference **Heated Products Supplement**.
K. For three phase units, verify direction of rotation of blower wheels (note direction arrows on the blower wheel housing). Correct if needed by changing polarity of three phase power.

L. **VERY IMPORTANT** Using a clamp meter, measure the amperage to each motor and ensure that they do not exceed the amperage listed on the product label.
M. If applicable, adjust the air intake grille(s) such that the output air stream reaches the floor. For temperature control and environmental separation applications, the air stream should reach the floor with sufficient strength to create an air seal around the door opening without creating turbulent mixing of the inside and outside air. If applicable, adjust the air intake grille(s) such that the output air stream reaches the floor. For flying insect control applications, the air stream should reach the floor with maximum strength. If after proper installation and adjustment, the product appears to be producing too little or too much air for the application, contact the manufacturer.

MAINTENANCE

WARNING

To reduce the risk of fire, electrical shock, or injury to persons, observe the following:

A. Maintenance is to be performed only by qualified personnel who are familiar with local codes and regulations and are experienced with this type of product.
B. Before servicing or cleaning the product switch power off at service panel and lock service panel to prevent power from being switched “ON” accidentally.

Routine maintenance is required to keep this product operating at its peak performance and efficiency. Over time, the housing, air intake grille, air intake filter, blower wheels and motor(s) will accumulate a build up of dust, debris and other residue. It is imperative to keep these components clean. Failure to do so will not only lower operational efficiency and performance, but also reduce the useful life of the product. The time between cleanings depends on the application, location, and daily hours of use. On average, under normal use conditions, the product should require a thorough cleaning once every six (6) months.

To clean the product, perform the following:

1. Verify the product has been disconnected from the power source.
2. Use a damp cloth and either a warm mild soapy water solution or bio-degradable degreaser, to wipe down the exterior components of the housing.
3. To access the interior of the product, remove the air intake grille(s) and/or air intake filter(s). This is accomplished by removing the screws on the face of the air intake grille(s)/filter(s) and releasing the grille by pulling on the spring hinge.
4. Thoroughly clean the air intake grille(s) and clean or replace the intake filter(s).
5. Thoroughly wipe down the motor, blower wheels and blower wheel housings. Be careful not to spray the motor with a water hose.
6. The motor(s) require no additional lubrication. They are permanently lubricated and feature double sealed ball bearings.
7. To re-install the product, reverse the procedures above.
8. Reconnect the power source to the product.
9. If you have any questions regarding the maintenance of the product, contact the manufacturer.

SPECIAL APPLICATIONS

Outdoor Installation

For outdoor unit special consideration may be required for enclosure, motor, wheel, and other components to minimize damage caused by exposure to the outdoor elements. Contact factory for special construction and costing.

Freezer and Cooler Installation

Air curtain must be mounted on the warm side for optimal performance. Variable Frequency Drive (VFD) is strongly recommended to control the air curtain air flow velocity at the floor level.

High humid areas may require de-humidifier or additional defrost cycle to minimize condensation and freezing for freezer applications. We recommend the air curtain unit to not replace doors but work in conjunction with door opening sequence cycle.
Contact factory for details.

DISCLAIMER

Mars reserves the right to change specifications and product design without notice. Such revisions do not entitle the buyer to corresponding changes, improvements, additions, or replacements for previously purchased equipment.

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Document No: HT-IOM
Date: 10/20/2023

HEATED PRODUCTS SUPPLEMENT

NOTE

Before proceeding, refer to the unit's specific IOM Manual for safety, installation, and startup information. Verify proper voltage to the product per local and NEC codes. Ensure proper rotation for units with three phase motors.

Electric Heated Products

Electric heated products are certified only for indoor use. Electric heated products come standard with a thermostat (shipped loose, unless ordered as factory pre-mounted) which is to be field installed at eye level within 3 feet of the unit.

Note:

1. Electric heated Low Profile 2, Standard 2, High Velocity 2, Extra Power 2, and Phantom series units come standard with internally mounted controls with 24V control circuit (FIG. 1).
2. Wiring connection for the electric heated Low Profile 2 units is at the top of the housing which can be accessed by removing the top cover plate, while internal terminal blocks are provided for electric heated Standard 2, High Velocity 2, Extra Power 2, and Phantom series units.
3. Electric heated Wind Stopping and WindGuard units include an electric heater control panel mounted on the right-hand side, as standard. Optional motor/unit control panel available, which includes a remote 24-volt thermostat with On/Off switch with terminals provided.

The thermostat should be mounted close to the product to best sense the air temperature in the vicinity of the door opening. Connect proper voltage to the product per local and NEC codes.

Thermal overload protection is built into all heater coil assemblies. In the event of an overload condition, the overload will trip and disconnect electrical power from the heater coil. Upon diagnosing and fixing the problem, power can be reconnected to the heater coil by manually resetting the thermal overload by way of the buttons(s) or lever(s) located in the unit or panel.

To operate multiple units in conjunction using a single door switch and single thermostat, a primary/secondary configuration is required (FIG. 2).

For high ampacity units, additional holes can be drilled to bring in additional electrical wires. Use appropriate bushings for new holes to protect wire casing. High temperature silicon wires are recommended for main supply power.

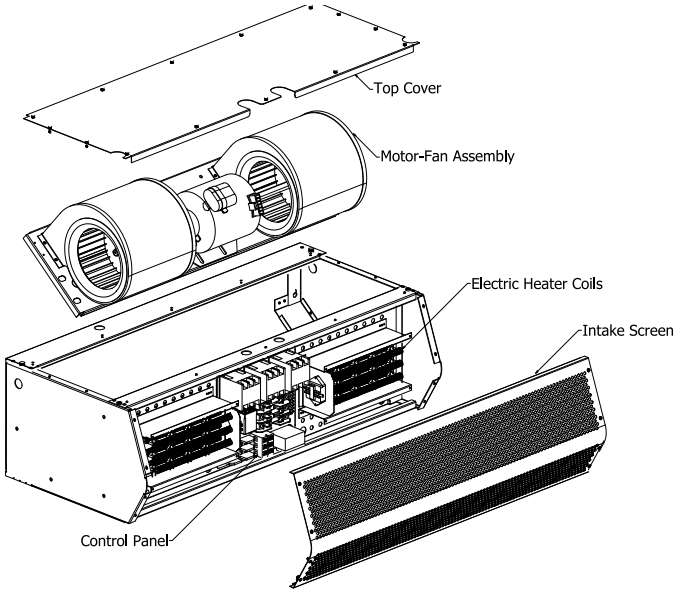

FIG. 1 (Electric Heated STD2 unit)

An unobstructed clearance space of 18-24" is required at the top of all heated air curtains to allow for service and optimal performance.

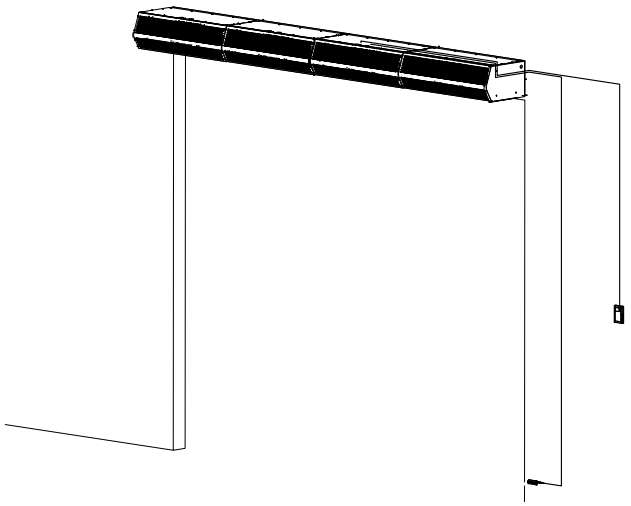

FIG. 2 (Tandem Mounted Primary/Secondary Units)

Hot Water and Steam Heated Products

Hot water and steam heated products are certified only for indoor use. Low Profile 2, Standard 2, High Velocity 2, Extra Power 2, and Phantom series units are shipped with coils mounted in the interior of the unit. Wind Stopping and WindGuard units are shipped with coils factory mounted to the exterior of the unit.

Once the coil has been secured to the cabinet, access to the motor and fan is through the removable access panels located on the top of the cabinet for Standard 2, High Velocity 2, Extra Power 2, Phantom series, and WindGuard units.

Note: Low Profile 2 and Wind Stopping units require the removal of the coil to access the motor(s) and/or fans.

All piping should be done by a licensed pipe fitter and in accordance with local codes and regulations. Connect the supply and return fittings as required. All traps and valves are to be sized and field installed by others. For Standard 2, High Velocity 2, and Extra Power 2 units, front intake screen must be removed to access vent plugs. Standard coil configuration is right hand supply and left-hand return (FIGS. 3 & 4) except for Low Profile 2 series, which has supply and return connection on the same end. Optional temperature controls, if ordered, are to be field installed by others.

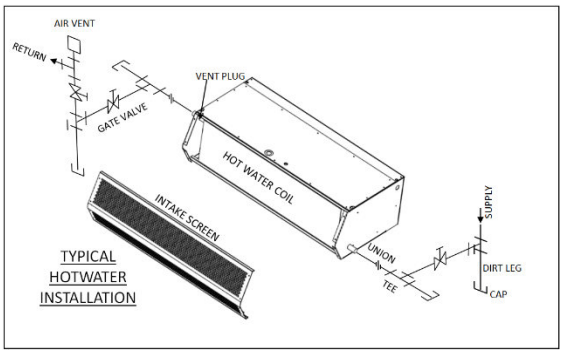

FIG. 3 (Hot Water Heated STD2 Unit)

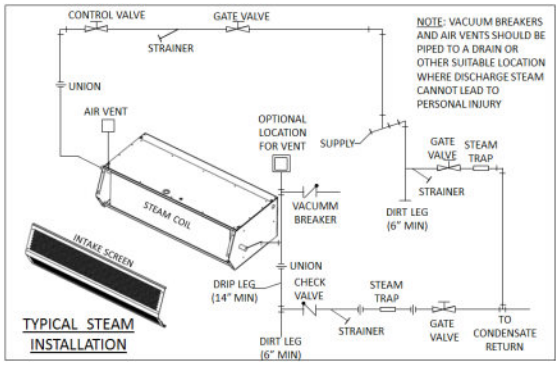

FIG. 4 (Steam Heated STD2 Unit)

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TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
NO AIR BLOWING OUT OF DISCHARGE NOZZLE	- No power being supplied to the unit from the electrical power source	- Confirm power source / check if in on position
	- Circuit breaker is tripped	- Reset circuit breaker
	- Blown fuses on power supply	- Replace fuses
	- Motor overload is open or tripped	- Allow the motor to cool down; motor has auto reset internal overload; if unit is panel equipped, press reset button on overload inside panel, or replace motor overload if overload remains tripped
	- Motor contactor / relay defective (if applicable)	- Check voltage to coil; check contacts to see if they are pulling in
	- Failed switch	- Replace or repair limit switch
MOTOR IS RUNNING BUT FANS ARE NOT SPINNING	- Loose or broken coupling (belt drive)	- Replace or tighten coupling
	- Loose set screws on wheel hubs	- Tighten set screws on motor shaft flats
	- Fan spinning inside fan housing	- Tighten fan on shaft or replace fan
	- Broken fan hub	- Replace fan wheels
ELECTRICAL CONTROLS NOT WORKING WHEN DOOR IS OPEN	- Switch is in off position	- Turn unit's switch to the on position
	- Door limit switch is not operating	- Repair or replace door limit switch
UNIT WILL NOT TURN OFF	- Door limit switch is permanently closed or energized	- Position the door switch in a manner that turns off the unit when the door closes and turns on the unit when the door opens. Only light pressure required.
LOW AIR FLOW	- Discharge air vanes out of adjustment	- Adjust vanes to proper position (Refer to Start-Up Section in this manual)
	- Obstruction on intake or discharge	- Remove obstruction or move air curtain
	- Power leads out of polarity	- Switch power leads to correct polarity (3 phase models only)
	- Blower motor rotating below normal speed	- Apply proper voltage per unit requirement (see unit label) / Adjust adjustable motor speed knob (if applicable)
	- Fan rubbing against housing	- Free fan from housing
	- Blower wheels clogged with dirt	- Clean and remove dirt from blower wheels
EXCESSIVE AIR VELOCITY AT DOOR OPENING	- Nozzle out of adjustment and not angled far out enough (BD only)	- Adjust nozzle angle to outside
	- Air temperature too cold	- Add auxiliary heat to overcome wind chill
	- Air stream pushing air outside of the building	- Adjust discharge angle back into building
AIR NOT HITTING THE FLOOR	- Low air velocity	- Adjust vanes to proper position or check installation height (Refer to Start-Up Section in this manual)
	- Obstruction in the direction of air flow	- Remove obstruction or move air curtain (Move out 3/8" for every 1" up from the door)
	- Negative building pressure	- Provide a make-up air system to relieve negative building pressure
UNEVEN AIR	- Shaft rotating inside fan	- Replace fan or tighten fan on shaft
	- One motor not functioning	- Replace or repair motor
EXCESSIVE NOISE AND OR VIBRATION	- Loose or broken coupling (belt drive)	- Replace or tighten coupling
	- Loose set screws on wheel hubs	- Tighten set screws on motor shaft flats
	- Fan spinning inside fan housing	- Tighten fan on shaft or replace fan
	- Broken fan hub	- Replace fan wheels
	- Bearing end caps worn	- Replace Bearing end caps
	- Damaged blower wheel	- Replace Blower Wheel
	- Bearing end caps worn	- Replace Bearing end caps
	- Pillow block bearings make noise	- Grease Bearing
	- Balancing clips missing	- Replace Blower Wheel

TROUBLESHOOTING MOTOR

To determine if the motor is in good operating condition, compare measured motor resistance at the motor terminals to the values shown below.

MARS MOTOR RESISTANCE READINGS

Single Phase Motors

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Applicable Air Curtain Series	Mars Part #	Manufacturer Part #	Brand	Motor Rating	HP	Voltage	Phase	Capacitor Rating	Motor Frame	MOTOR WIRES OR TERMINAL (T) OHM READINGS HIGH SPEED (1750) Black Motor Wire & White Motor Wire	MEDIUM SPEED (1650) -	LOW SPEED (1450) -
LPV2, LPN2	03-001	7190-1682	Fasco	Nema 1	1/6	115	1	5 µF 370Vac	-	11.5	-	-
	03-002	7190-1903	Fasco	Nema 1	1/6	115	1	5 µF 370Vac	-	8.4	-	-
	03-003	7190-1825	Fasco	Nema 1	1/6	230	1	4 µF 440Vac	-	64	-	-
	03-004	7190-1904	Fasco	Nema 1	1/6	230	1	6 µF 370Vac	-	44.6	-	-
	03-124	7190-3307	Fasco	Nema 1	1/6	115/230	1	10 µF 370Vac	-	8.2/36	-	-
	03-124	K33NVDHJ-1446	US	Nema 1	1/6	115/230	1	10 µF 370Vac	-	8.1/32	-	-
Applicable Air Curtain Series	**Mars Part #**	**Manufacturer Part #**	**Brand**	**Motor Rating**	**HP**	**Voltage**	**Phase**	**Capacitor Rating**	**Motor Frame**	**White Motor Wire (T1) & Black Motor Wire (T3)**	**White Motor Wire (T1) & Black Motor Wire (T5)**	**White Motor Wire (T1) & Black Motor Wire (T2)**
STD2, N2, PH10, QP10	03-010	34G928X169	Baldor	Washdown (IP54)	1/2	115	1	-	56Z	1.2	-	-
	03-010	34G928X169	Baldor	Washdown (IP54)	1/2	208/230	1	-	56Z	4.6	-	-
	03-005	7124-1175	Genteq	Nema 1	1/2	115	1	7.5 µF 370Vac	48	2.6	3.8	5.2
	03-006	7124-1560	Genteq	Nema 1	1/2	208/230	1	10 µF 370Vac	48	9.9	15.9	22.5
	03-007	48S17T439	Marathon	Nema 1	1/2	277	1	-	48Z	7.7	-	-
	03-005	K055PWM1736C13H	Nidec	Nema 1	1/2	115	1	10 µF 370Vac	48Y	2.1	3.7	5.2
	03-005	K055PWM1736C13H	US	Nema 1	1/2	115	1	10 µF 370Vac	48Y	5.3	3.7	5.4
	03-006	K55HXPNA-2845	US	Nema 1	1/2	208/230	1	10 µF 370Vac	48Y	8.7	18.2	24.2
Applicable Air Curtain Series	**Mars Part #**	**Manufacturer Part #**	**Brand**	**Motor Rating**	**HP**	**Voltage**	**Phase**	**Capacitor Rating**	**Motor Frame**	**White Motor Wire (T1) & Black Motor Wire (T2)**	**White Motor Wire (T1) & Black Motor Wire (T3)**	**-**
HV2, NH2, PH12	03-021	35T276R025G1	Baldor	Washdown (IP54)	1	115	1	-	56Z	0.7	-	-
	03-015-Baldor	35M316S174	Baldor	Nema 1	1	115	1	-	56Z	0.6	-	-
	03-015-Baldor	35M316S174	Baldor	Nema 1	1	208/230	1	-	56Z	2.2	-	-
	03-021	35T276R025G1	Baldor	Washdown (IP54)	1	208/230	1	-	56Z	2.8	-	-
	03-014	7124-0985	Genteq	Nema 1	1	115	1	50 µF 370Vac	56	1.6	2.4	-
	03-015	7124-1096	Genteq	Nema 1	1	208/230	1	30 µF 370Vac	56	6.5	9.2	-
	03-015	-	Nidec	Nema 1	1	208/230	1	20 µF 370Vac	48Y	4.3	6.5	-
	03-014	K55BWJZB-2362	US	Nema 1	1	115	1	20 µF 370Vac	48Y	1	2.1	-
	03-015	-	US	Nema 1	1	208/230	1	20 µF 370Vac	48Y	3.2	6.3	-

Three Phase Motors

Applicable Air Curtain Series	Mars Part #	Manufacturer Part #	Brand	Motor Rating	HP	Voltage	Phase	Motor Frame	LEAD WIRE OHM READINGS Black Motor Wire (L1) & Red Motor Wire (L2)	Black Motor Wire (L1) & White Motor Wire (L3)	Red Motor Wire (L2) & White Motor Wire (L3)
STD2, N2, PH10, QP10	03-008	P55YYDHB-1527	US	Nema 1	1/2	208-230	3	48	16.1	16.1	16.1
	03-008	P55YYDHB-1527	US	Nema 1	1/2	460	3	48	63.6	63.6	63.6
	03-009	48T17T135	Marathon	Nema 1	1/2	575	3	48	136	136	136
HV2, NH2, PH12	03-017	56T17T5541	Marathon	Nema 1	1	208-230	3	56Z	4.3	4.3	4.3
	03-017	56T17T5541	Marathon	Nema 1	1	460	3	56Z	16.5	16.5	16.5
	03-018	56T17T5544	Marathon	Nema 1	1	575	3	56Z	26.6	26.6	26.6
	03-022	35N127S902	Baldor	Washdown (IP54)	1	208-230	3	56Z	5.1	5.1	5.1
	03-022	35N127S902	Baldor	Washdown (IP54)	1	460	3	56Z	19.8	19.8	19.8
EP2	03-026	165716	Century	Nema 1	3	208-230	3	U56Y	1.5	1.5	1.5
	03-026	165716	Century	Nema 1	3	460	3	U56Y	5.7	5.7	5.7
	03-026	P63TYFMJ-1687	US	Nema 1	3	208-230	3	56HZ	1.2	1.2	1.2
	03-026	P63TYFMJ-1687	US	Nema 1	3	460	3	56HZ	4.4	4.4	4.4
	03-028	35E92Y26	Baldor	Nema 1	3	575	3	56Z	9.2	9.2	9.2
WMI	03-110	36H110-2211G1	Baldor	Nema 1	1,2,3	208-230	3	184Z	3.5	3.5	3.5
	03-110	36H110-2211G1	Baldor	Nema 1	1,2,3	460	3	184Z	13.5	13.5	13.5
WMH	03-055	37F932W828G1	Baldor	Nema 1	5	230	3	215YZ	0.7	0.7	0.7
	03-055	37F932W828G1	Baldor	Nema 1	5	460	3	215YZ	2.4	2.4	2.4
	03-046	37F909X889G1	Baldor	Nema 1	7	230	3	215YZ	0.6	0.6	0.6
	03-046	37F909X889G1	Baldor	Nema 1	7	460	3	215YZ	1.6	1.6	1.6
BD	03-033	U639A - 215TTFC6027	Marathon	Nema 1	10	208-230	3	215T	0.4	0.4	0.4
	03-033	U639A - 215TTFC6027	Marathon	Nema 1	10	460	3	215T	1.2	1.2	1.2
	03-074	GT1128A 170118.60	Marathon	Nema 1	25	575	3	284TS	0.5	0.5	0.5

WARRANTY

Mars' warranty coverage, period, extent, and limitations apply to the product only. It does not apply to labor. Mars warrants that the Mars product 1) is free from defects in materials and workmanship, and 2) conforms to Mars' published specifications. The warranty period for Mars products (except for heated models, custom models, or WMI, WMH and BD models) is a five (5) year period commencing on the date of shipment. The warranty for heated models is an eighteen (18) month period, the warranty for custom models and for accessories is a twelve (12) month period, and the warranty for WMI, WMH, and BD models is a twelve (12) month period. The date on the customer's invoice is the date of shipment unless Mars or your reseller informs you and Mars otherwise. Mars will provide free replacement of any part that fails as a result of a defect in material or manufacturer's workmanship. Changes in operational specification parameters that differ from those provided on the original purchase order are not covered. Mars products are inspected and tested before packaging and are shipped in working condition. The warranty for Mars products only covers free-of-charge replacement of failed parts. The warranty does not cover labor and transportation expenses that may be required to deliver and to install replacement parts. Because in many instances it is impossible to determine the cause of failure, the customer may be responsible for transportation charges associated with replacement of failed part. Mars does not warrant uninterrupted or error-free operation of Mars product. Under no circumstance is Mars liable for any of the following: 1) third-party claims against you for damages, 2) special, incidental, or indirect damages, or 3) any economic consequential damages (including lost profits and savings), regardless of whether Mars, its suppliers, or its resellers were informed of the possibility of damages. The warranty does not cover repair or exchange of Mars products resulting from misuse, accidental damage, modification, unsuitable physical or operating environment, improper maintenance or installation by customer, or failure caused by a product for which Mars is not responsible. The warranty does not cover damages caused by mishandling during transportation. The warranty is voided by removal or alteration of Mars product or parts identification labels, and by improper installation of product and resulting non-compliance with federal, state, and local codes and regulations. Additionally, Mars reserves the right to void the warranty for non-payment of invoice.

CONTACT FACTORY FOR COMPLETE PARTS LIST FOR ALL MODELS.

KEEP THIS MANUAL FOR YOUR RECORDS.

Model Number:_____

Serial Number: _____

Date Purchased: _____

Dealer Purchased From: _____

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Door Switches 99-125 Used for all air curtains

NEMA1 to NEMA9 Models

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Door Switch Number	Description	Max Voltage	Phase	Max HP	Amperage	Poles	NEMA Rating
Mechanical Switches – controller not required for air curtains under switch electrical limits							
99-014	Combination Plunger/Roller	250V	1	1	20 A	1	NEMA 1
99-270	Washdown Roller	250V	1	1	20 A	1	NEMA 4X
99-016	Explosion Resistant Roller	250V	1	¾	15 A	1	NEMA 7 and 9
Magnetic Switches – controller required							
99-018	Commercial, Plastic, Surface Mounted	24V	1	-	½ A	1	NEMA 1
99-125	Industrial, Metal, Surface Mounted	120V	1	-	3 A	1	NEMA 1
99-124	Industrial, Metal, Floor Mounted	120V	1	-	3 A	1	NEMA 1

Note: DO NOT ground the green wire (for 99-124 and 99-125) or COM terminal (for all others). This is the switch common, not ground or neutral. Please refer to the wiring instructions included with the switches.

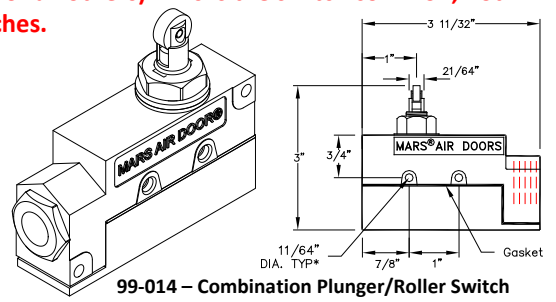
Mechanical Switch Features:

Combination Roller/Plunger Switch (99-014)

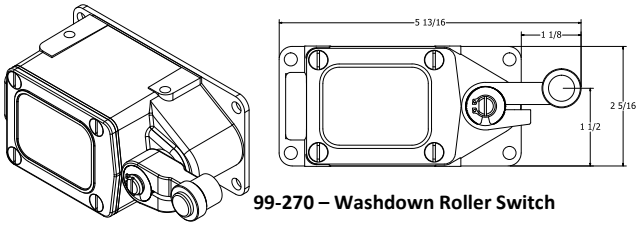
- Rated for NEMA 1 applications (field installed by others)
- Used to enable automatic control of air curtain(s): turns air curtain on when door opens and off when door closes
- Suitable for various applications and installation types
- Maximum ratings of 250V, 20A, and 1HP (see individual model specs for details)
  - If the air curtain exceeds any of these ratings, or if it is three phase, a Motor Control Panel (MCP) or solid state controller is required
- Single pole (1P) switch with normally closed (NC) and normally open (NO) contacts
  - Only normally closed and common (COM) terminals are provided with screws for wiring
- Requires less than 1/8" of travel and 2 lbs. of force on plunger to activate switch
- 1/2" FPT conduit connection (field wired by others)
- (2) 11/64" mounting holes*

**Do not use a fastener larger than a #6 sheet metal screw or a #8 Machine screw to mount this door limit switch. Larger screws may damage the switch and void the warranty.*

- 1 year parts warranty for all switches



99-014 – Combination Plunger/Roller Switch



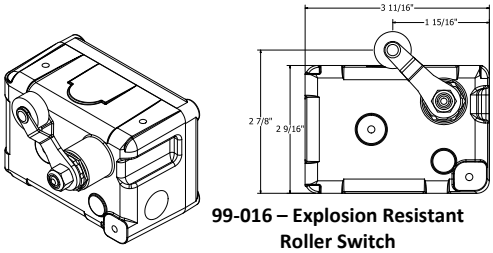
99-270 – Washdown Roller Switch

Washdown Roller Switch (99-270)

- UR (UL Recognized) and rated for NEMA4X/IP55

Explosion Resistant Roller Switch (99-016)

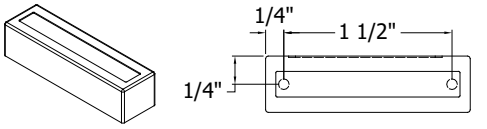
- UR (UL Recognized) and rated for NEMA 7 & 9 (Class 1, Division 1, Group D)



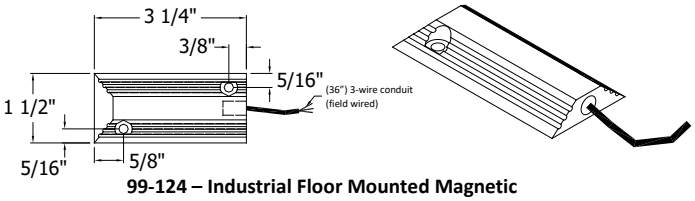
99-016 – Explosion Resistant Roller Switch

Magnetic Switch Features:

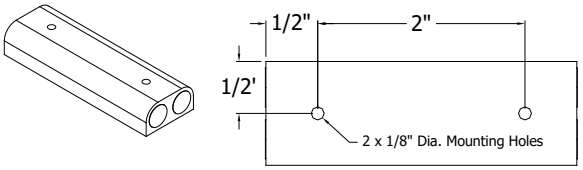
- UR (UL Recognized) and rated for NEMA 1 applications (field installed by others)
- Used to enable automatic control of air curtain(s): turns air curtain on when door opens and off when door closes
- Typical applications for each switch:
  - 99-018: for neat trim and finish in commercial applications
  - 99-125: for heavy duty industrial applications
  - 99-124: for roll-up doors with forklift traffic
- A Motor Control Panel (MCP) or solid state controller is required for use with all magnetic door switches (except for electric heated air curtain)
  - For 99-018, MCP-24V adder is required for use with MCP
- Single pole (1P) switch with normally closed (NC) and normally open (NO) contacts
- Maximum acceptable gap of 1/8" distance (commercial) or 1/2" (industrial) between magnets to activate switch
- Lightweight and easy to install
- 1 year parts warranty for all switches



99-018 – Commercial Surface Mounted Magnetic Switch



99-124 – Industrial Floor Mounted Magnetic



99-125 – Industrial Surface Mounted Magnetic Switch

Control Options

Multi option and Variable speed Switches

atmosphere is everything

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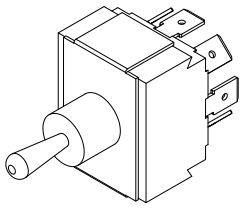
Model Number	Description
Unit Mounted Options	
INS-CTRL‡	Accessory, Unit Mounted, 24v Ctrl, Unhtd, up to 600v (4 Mtr Max), STD2/QP10/PH10/12 (RH Panel for HV2)
INS-SW	Accessory, Unit Mounted, Switch, ON/OFF, 115/230V, 1ø, 1HP max (Specify Location)
INS-2S*	Accessory, Unit Mounted, Switch, 2 Spd, HI/OFF/LO, 250V, 15A, 1ø, 1-1/2 HP Max
INS-2H	Accessory, Unit Mounted, Switch, HI/LO Heat, Elec Htd, LPV2/QP8/QP10/STD2/HV2/PH8/PH10/PH12
INS-PS	Accessory, Unit Mounted, Prim/Sec Ctrl, 24V Ctrl, LPV2/QP8/QP10/STD2/HV2/PH8/PH10/PH12
INS-TD	Accessory, Unit Mounted, Adjustable Time Delay, 1sec-17min, 24V Ctrl
INS-HD	Accessory, Unit Mounted, Heat on Demand, LPV2/QP8/QP10/STD2/HV2/PH8/PH10/PH12
INS-CP	Accessory, Unit Mounted, 8' Cord & Plug, 115/230V, 1ø, 1HP Max, Unhtd, (Specify Location)
INS-SOO	Accessory, Factory Wired Adder, Special Sequence of Operations
INS-NR	Accessory, Factory Mounted, Noise Reduction Package, LP2/STD2/PH10/PH12/HV2 (per Motor Fan Assembly)
INS-FP	Accessory, Factory Mounted, Freezer Package
Remote Mounted Options §	
RMT-SW	Accessory, Remote Mounted, Switch, ON/OFF, 250V, 15A, 1ø, 1-1/2 HP Max, NEMA 1
RMT-MCP	Accessory, Remote Mounted, Motor Ctrl Panel, Elec Htd
RMT-2S*	Accessory, Remote Mounted, Switch, 2 Spd, HI/OFF/LO, 250V, 15A, 1ø, 1-1/2 HP Max, NEMA 1
RMT-3S**	Accessory, Remote Mounted, Switch, 3 Spd, HI/MED/LO/OFF, 240V, 15A, 1ø, 1 HP MAX, NEMA 1
RMT-VLE	Accessory, Remote Mounted, Switch, Variable Spd, ON/OFF, 240V, 5A, Elec Htd, LPV2/QP8/PH8
RMT-VLA	Accessory, Remote Mounted, Switch, Variable Spd, ON/OFF, 120V, 6A, Unhtd/HW/S, LPV2/QP8/PH8
RMT-VLD	Accessory, Remote Mounted, Switch, Variable Spd, ON/OFF, 208/230V, 6A, Unhtd/HW/S, LPV2/QP8/PH8
RMT-VSA†	Accessory, Remote Mounted, Switch, Variable Spd, ON/OFF, 120V, Unhtd, 1 HP Max, PSC Mtr Only
RMT-VSD†	Accessory, Remote Mounted, Switch, Variable Spd, ON/OFF, 208/230V, Unhtd, 1 HP Max, PSC Mtr Only
RMT-HOA	Accessory, Remote Mounted, Switch, HOA, 240V, 3A, 1ø, NEMA 1 (Pnl Req'd for Unhtd/HW/S/IDF)
RMT-HOA-K	Accessory, Remote Mounted, Switch, HOA, 240V, 3A, 1ø, NEMA 1, Lockable (Pnl Req'd for Unhtd/HW/S/IDF

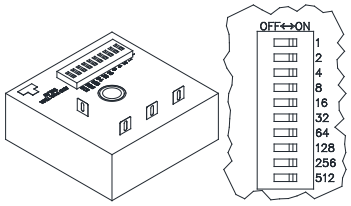
‡ Minimum 20" service clearance required for right hand panel for HV2. Specify for other panel mounting locations.
* 2-speed RPM: H=1750, L=1650 (Htd) or 1425 (Unhtd)
** 3-speed RPM: H=1750, M=1650, L=1425
† Not applicable for Washdown and Explosion Proof motors
§ RMT options not applicable with Motor Control Panel – see MCP submittal for relevant options

Options and Accessories Features:

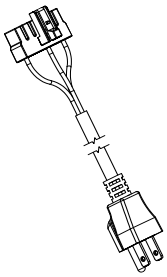
- Components are UR (UL Recognized) and rated for NEMA 1 or NEMA 3 applications (unless otherwise specified)
- "INS" accessories are installed on the unit or applied at the factory as standard
- "RMT" accessories are remote mounted in a NEMA 1 enclosure (field installed and wired, by others). Not applicable with Motor Control Panels
- Applications and rating limitations are specified in each accessory description and listed in chart above
- Additional NEMA/IP ratings available; contact factory for additional information
- 1 year parts warranty



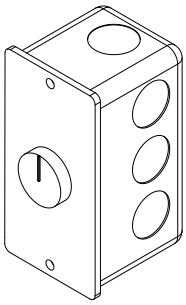
INS-2S: 2 Speed (Hi-Lo-Off)



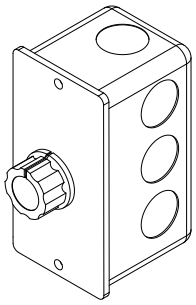
INS-TD: Adjustable Time Delay
(Turn ON dip switches to add time delay)



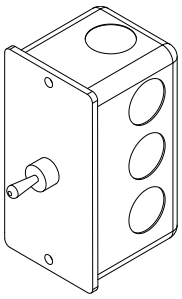
INS-CP: 8' Cord and Plug



RMT-VSA: Variable Speed

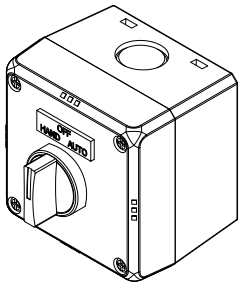


RMT-3S: 3 Speed



RMT-2S: 2 Speed

(2x4 junction box standard for remote mounted options, unless otherwise specified)



RMT-HOA: Hand-Off-Auto
(3x3x2.5 junction Box)