1. Overview
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Overview
Overview
Azure® Digi-Motor®

• Azure® Digi-Motor®: Blower Motor
  – Multi-Horsepower ECM (1/5 HP – 1 HP) for air handlers, heat pumps, fossil fuel/electric heat, and AC systems, etc.
  – Only two motors to stock:
    1. MARS No. 10860: 1/5 HP to 1/2HP, 115/230V, reversible rotation, (replaces original 10800)
    2. MARS No. 10861: 1/2 HP to 1 HP, 115/230V, reversible rotation, (replaces original 10801)
Overview
Azure® Digi-Motor®

• Applications for Azure®
  – Replaces Genteq/GE OEM ECM X-13 motors
    ✓ Emerging opportunity as warranties expire
    ✓ 5,000,000 motor installed base
    ✓ OEM replacement X-13 motors are expensive
    ✓ NOTE: Azure® does not replace Genteq 2.0, 2.3, 2.5, and 3.0 ECM; Azure® replaces motors marked X-13 (on motor label)
  – BONUS: Replaces standard PSC motors, too
    ✓ 65,000,000+ of these old motors
    ✓ Nice upgrade opportunity
    ✓ Nice truck motor for ALL service calls
Overview
Azure® Digi-Motor®

• **Origin of the Azure® Digi-Motor®**
  
  – The Digi-Motor® has been in existence for 6 years as a basic OEM ECM type motor and is currently trusted by Carrier, Trane, York, Goodman, Nordyne, and **MARS**.
Overview
Azure® Digi-Motor®

• Origin of the Azure® Digi-Motor®
  – MARS conceptualized and specified the unique features of the Azure® Digi-Motor® specifically for the HVAC aftermarket;
    ➢ Broad Ocean Motor Company manufactures Azure® for MARS using the OEM version of the Digi-Motor® as a basic ‘building block’.
  – The Azure® Digi-Motor® is the latest generation featuring the most innovation of any aftermarket HVAC EC motor available today.
Overview
Azure® Digi-Motor®

• **Two Motors Replace:**
  – ALL Evergreen AH, IM, and EM motors by Genteq
  – ALL Ecotech Rescue motors by US Motors
  – ALL standard PSC type motors 1/5 HP to 1 HP
  – ALL Genteq X-13 motors 1/5 HP to 1 HP

**NOTE:** Azure® does not replace Genteq 2.0, 2.3, 2.5, 3.0, 5.0 or EON motors
Key Features
Key Features
Azure® Digi-Motor®

• High Efficiency ECM (85% peak)
  – Lower operating cost & possible energy rebate

• Self Programming
  – Automatically sizes itself to the application at initial start-up for optimal performance

• Field Programmable (with optional controller)
  – Allows custom tailoring of Azure® to the application
    • Programmer is a portable tool that unlike a PWM controller does not need to be installed into the system.
Key Features
Azure® Digi-Motor®

• Optional Hand Held Programmer (MARS No. 08502)
  – Increase speed for high altitude applications
  – Decrease speed for high humidity applications
  – Duplicate speeds on any of the 4 speed taps
  – Optimize blower performance in multi-stage systems
  – Cost is about the same as a single PWM control card
  – Works with ALL generation 2 motors

  – Displays % of torque being applied by the motor on the tap being energized.
Key Features
Azure® Digi-Motor®

• Two Stage Surge Protection
  – Replaceable outboard 6,000V protector  
    (Wire harness allows easy bypass of this surge protector)
  – Permanent inboard 4,000V protector

• Constant Torque Design
  – Maintains CFM as filter becomes dirty

• Compact Motor Shell
  – 1/2HP is 5/8” shorter than Evergreen
  – 1HP is 1-1/8” shorter than Evergreen
Key Features
Azure® Digi-Motor®

• Inventory Reducer
  – 2 motors cover all PSC/X-13 blower motor applications up to 1HP; 115/230V and CW/CCW

• Simple Wiring
  – Connects exactly like a PSC motor (capacitor not needed)
  – Connects exactly like an X-13 motor
Construction
Construction
Azure® Digi-Motor®

- Standard 48 frame 5.5” diameter
- Ball Bearing Design
- Epoxy Encapsulated electronics
  - Protects from moisture and vibration
Construction
Azure® Digi-Motor®

• **Bypassable External 6KV Surge Protector**
  (4,000V secondary protection remains inside motor)

  – Failed surge protector can be removed and the harness can be reconnected without the external surge protector (if a replacement is not readily available).

  *(Reconnect without protector)*
Construction
Azure® Digi-Motor®

• Integrated Wire Jumpers
  – Configuration jumpers are actually part of the wire harness and cannot be lost like separate ‘clip’ type jumpers. Connect or disconnect for desired operation.

  – Red: Voltage
  – White: Rotation
  – Blue: Mode of Operation
    (PSC or X-13)
Set-up & Installation
Set-Up & Installation
Azure® Digi-Motor®

1. Set Motor Voltage
   - Red Jumper
     - Close for 120V
     - Open for 240V

2. Set Motor Rotation
   - White Jumper
     - Close for CWLE
     - Open for CCWLE
Set-Up & Installation
Azure® Digi-Motor®

3. Set Motor Mode of Operation

Blue Jumper
Close for PSC
Open for X-13

3A. Insert X-13 PC Board Into
Wire Harness
(for X-13 applications, only)
Set-Up & Installation

Azure® Digi-Motor®

4. Install Azure® Digi-Motor® into blower

Install with the wire harness between 4 and 8 o’clock to minimize chance of moisture entering the motor where the wires enter the module.
Set-Up & Installation
Azure® Digi-Motor®

Auto Sizing & Connecting Azure®
For
PSC Motor Applications
Auto Sizing The Azure® Digi-Motor®

PSC Mode

1) Make Connections
2) Apply power; motor runs 2 minutes and stops
3) Remove brown/white harness & red speed tap (5)
4) Connect desired 115V speed taps
5) Test operation
Connecting The Azure® Digi-Motor®

PSC Mode

MULTI COLOR SPEED TAPS

To 115V Blower Motor Speed Control

WHITE
To Neutral

GREEN/YELLOW
To Ground

Basic 4 speed HVAC control board

Same connections as PSC motor; but no capacitor
Connecting The Azure® Digi-Motor®

PSC Mode

• Options For Constant Fan Operation

1. Connect orange speed tap 1 to FAN terminal (if equipped) on system control board. 625 RPM will be controlled by thermostat.

   Or

2. Connect orange speed tap 1 to LINE POWER. 625 RPM will be controlled by main power to HVAC system. Thermostat can be left in AUTO mode; motor will run at 625 RPM 24/7 (unless there is a call for heat/cool).

   Or

3. Install MARS Constant Fan Kit (MARS No. 08595).
Connecting The Azure® Digi-Motor®

PSC Mode

- **Constant Fan Kit (MARS No. 08595)**

  Kit includes (1) SPST relay and (3) 24” lengths of pre-terminated leads.

**Notes on Installation:**
Disconnected G wire between T-Stat and HVAC system control board.

Some systems energize Y and G simultaneously for AC and constant fan; if so, jumper G and Y together on HVAC system control board.
Set-Up & Installation
Azure® Digi-Motor®

Auto Sizing & Connecting Azure®
For
X-13 Motor Applications
Auto Sizing The Azure® Digi-Motor®

X-13 Mode

Azure® plugs directly into the HVAC system wire harness. Just connect the 24V speed tap(s) and the job is complete. In fact, the connections for Azure® and X13 are identical. Note: The only difference will be that Azure® has 5 speed taps from which to select, and the OEM X13 will have only the number of taps needed for the application.

1) Make Connections
2) Apply power; motor runs 2 minutes and stops
3) Remove brown/white harness
4) Connect desired 24V speed taps
5) Test operation
Connecting The Azure® Digi-Motor®

X-13 Mode

Azure® plugs directly into the HVAC system wire harness. Just connect the 24V speed tap(s) and the job is complete. In fact, the connections for Azure® and X13 are identical.

Note: The only difference will be that Azure® has 5 speed taps from which to select, and the OEM X13 will have only the number of taps needed for the application.

Same connections as OEM X-13

From HVAC System

Factory Harness

Power Harness

From Azure® Motor

24V Speed Tap Harness

From Azure® Motor

Low

Med

High

One Lead to Cool on TStat – Y (Cooling Speed)

One Lead to Heat on TStat – W (Heating Speed)
Connecting The Azure® Digi-Motor®
X-13 Mode

• Options For Constant Fan Operation

1. Azure® and X-13 are controlled by 24VAC. If the OE had a tap for low speed constant fan, connect the orange speed tap 1 to this location. 625 RPM would be controlled by thermostat.

Or

2. Connect orange speed tap 1 to +24V. 625 RPM will be controlled by main power to HVAC system. Thermostat can be left in AUTO mode; motor will run at 625 RPM 24/7 (unless there is a call for heat/cool). An external switch between orange speed tap 1 and +24V can be added.