



Sales and Engineering Data

ED 19123

Group: **Applied Air Systems**

Part Number: **ED 19123**

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Daikin EC Fan-Only Controller

for Vision, Skyline, and Custom Air Handlers

1. General

The Daikin EC fan-only controller will accept a setpoint command from the unit controller or building management system (BMS) and control the fan array per the defined configuration programmed/selected for the application. All fans in the array will be commanded by the fan controller to run at the same speed to achieve the commanded setpoint condition.

2. User Interface

The controller has an integrated HMI for field commissioning and system status communications, including alarms and warning notifications.

3. Operating Modes

3.1 Constant Air Volume

- a. Fan Speed (RPM) – local control
- b. Air Flow (CFM) – local control based on demand signal (Requires sensor)

3.2 Variable Air Volume

- a. Fan Speed (RPM) – demand input
- b. Duct Static Pressure (DSP) - local control based on demand signal (Requires sensor)

3.3 “Fan Tracking”

- a. When two arrays are used in a single application, one fan controller can be configured as the “tracking” array, allowing the tracking array’s fan speed to be coordinated with the primary fan array. The primary controller produces a 0-10 VDC analog output linearly proportional to the fan speed (RPM) which is fed into the analog input of the tracking array. The proportionality of the analog output to the tracking controller is defined by a field adjustable offset.
- b. Primary Controller Output – 0-10 VDC proportional to FAN SPEED
- c. Secondary Controller Input – 0-10 VDC adjusted per field configuration settings
- d. Once a controller is configured for fan tracking, the demand input defaults to 0-10 VDC

4. Demand Inputs to Controller

4.1 0 – 10 VDC

4.2 4 – 20 mA

4.3 BACnet

- a. MS/TP
- b. IP

4.4 Direct input via HMI on fan controller (manually adjust fan speed via HMI)

5. Manual Override

- 5.1 Overrides programmed setpoint – for use when servicing
- 5.2 Selectable from the controller HMI menu
- 5.3 Times out after 60 minutes

6. Sensor Inputs

- 6.1 Duct Static Pressure (DSP) Pressure Sensor – local duct static pressure control
 - a. Duct Pressure (differential pressure)
 - b. Field provided
 - c. Range: up to 40" w.c. (field configurable)
 - d. Output: 0-10 VDC or 4-20 mA (field configurable)
- 6.2 Total Airflow (CFM) Pressure Sensor – local airflow reporting and control
 - a. CFM (piezo ring)
 - b. Factory installed
 - c. Range: up to 40" w.c. (field configurable)
 - d. Output: 0-10 VDC or 4-20 mA (field configurable)

7. Other Controller Inputs

- 7.1 Start/Stop – enables/disables fan array operation from a remote device.
- 7.2 Interlock – disables fan array operation until contact closure is detected, i.e. damper actuator end switch.
- 7.3 Safety Input – disables fan array operation when field-installed safety device opens circuit (high static, freeze stat, etc.)

Note: Start/Stop, Interlock & Safety inputs may be configured either enabled or disabled for the application.

- 7.4 Fire Mode Input – indicates system has entered fire mode, REPORTING ONLY.

Note: Fans must be able to be controlled directly from the fire safety device, bypassing the fan controller, in case of fire event.

8. Controller Outputs

- 8.1 Modbus RS485 – controller to fan communications
- 8.2 RPM Analog Output – 2-10 VDC for fan tracking
- 8.3 CFM Analog Output – 2-10 VDC for array airflow reporting
- 8.4 Relay Output 1 (RO1) – dry contacts indicating array is ready for operation
- 8.5 Relay Output 2 (RO2) – dry contacts indicating array is running (input demand > 0%)
- 8.6 Relay Output 3 (RO3) – dry contacts indicating array is in an alarm condition

9. Communications from individual fans via Modbus

9.1 Identification – Product Range

9.2 Status – OK

9.3 Current Set Point

9.4 Current Parameter Settings

9.5 Fan Speed – RPM

9.6 Power – Watts

9.7 Alarm Codes (EBM Motor Status)

- a. Hall Sensor Error (HLL)
- b. Electronics Interior Overload (TEI_high)
- c. Motor Overheated (TFM)
- d. Power Module Overheated (TFE)
- e. Locked Motor (BLK)
- f. Communication Error (Not EBM Status – indicates loss of Modbus communications)
- g. Phase Failure (PHA – 3 phase motors)
- h. DC Link Under-voltage (UzLow)
- i. DC Link Over-voltage (UzHigh)
- j. Mains Under-voltage (PHA – single phase motors)
- k. Mains Over-voltage (UeHigh)
- l. RPM Fault – motor RPM is more than 300 RPM from demanded speed)

10. System Status

10.1 The user can access system status parameters in real time when the system is in operation.

10.2 The following parameters will be capable of display:

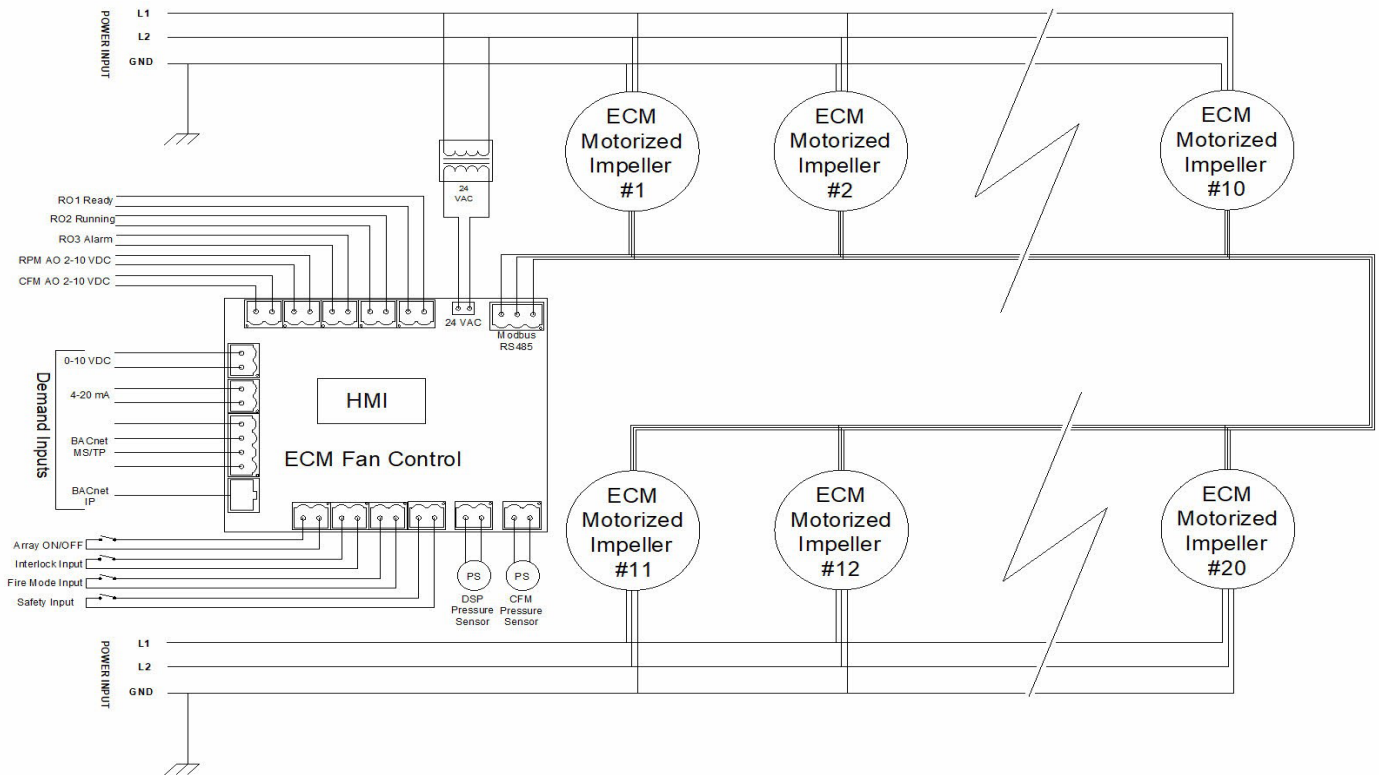
- a. Individual fan status – OK, Warning, Alarm
- b. Individual fan alarm code (during fault occurrence)
- c. Individual fan speed - RPM
- d. Individual fan power – Watts
- e. Command Input Mode – 0-10 VDC, 4-20 mA, BACnet
- f. Operating Mode – RPM, CFM, DSP
- g. Total System Power – Watts
- h. System alarm code (during fault occurrence)
- i. System alarm code history

11. System Alarms

- 11.1 Motor Failure – specific motor address, alarm code (from motor)
- 11.2 Fan RPM Incorrect – specific motor address (motor RPM feedback is $> \pm 300$ from demand)
- 11.3 Duct Pressure Warning – pressure outside of allowable tolerance (when used)
- 11.4 Piezo Ring Pressure Warning – pressure outside of allowable tolerance (when used for control)
- 11.5 Pressure Sensor Fault – pressure sensor reading below null threshold or above 0 +/- allowable offset when fan array is off.
- 11.6 Communication lost with motor – specific motor address, no response via Modbus
- 11.7 Fire Mode – the fire mode input indicates the system is operating in fire mode
- 11.8 Interlock Timer Expired – in systems where the interlock function is activated, the interlock circuit remains open beyond the selected delay time (time between the control receiving a start command and the interlock circuit closing)

Note: Alarms can be cleared either through the HMI or remotely through the analog input or BACnet.

12. System Diagram





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