

## MSEA Controllers

### FEC/FAC

#### Field Equipment Controller

The Metasys® Field Equipment Controllers (FEC) are a complete family of BACnet® compatible field controllers and accessories designed with the flexibility to meet a wide range of your HVAC control applications. Built on the ASHRAE standard for building automation system control and communication, these controllers support Johnson Controls commitment to open communication standards and greater control options for you.

The FEC family includes the 10-point FEC1600 and the 17-point FEC2600, as well as I/O expandability and VAV application specific controllers, all seamlessly integrated with the Metasys® building management system. FEC controllers are available with optional LCD display.

FAC Series controllers feature an integral real-time clock and support time-based tasks, which enables these field controllers to monitor and control schedules, calendars, alarms and trends.



#### Features

- Supports peer-to-peer communications
- Continuous tuning adaptive control provides more efficient control and reduces level of manual intervention
- Advanced diagnostics for failure detection, resolution and prevention
- Standard packaging and terminations simplify installation
- Field Equipment Controllers have been tested by the BACnet Testing Labs (BTL) and are certified as BACnet application specific controllers
- FAC models feature a integral real time clock with on-board time schedules, calendars, trends and alarms and are BTL certified as BACnet Advanced Application Controllers (B-AAC)

#### Point Type Counts per Model

Point Types	Signals Accepted	FEC16	FEC/FAC2611	FAC2612
<b>Universal Input (UI)</b>	Analog input, voltage mode, 0–10 VDC Analog input, current mode, 4–20 mA1 Analog input, resistive mode, 0–2k ohm, RTD (1k NI [Johnson Controls], 1k PT, A99B SI), NTC (10k type L, 2.252k type 2) Binary input, dry contact maintained mode	2	6	5
<b>Binary Input (BI)</b>	Dry contact maintained mode Pulse counter/accumulator mode (high speed), 100 Hz	1	2	4
<b>Analog Output (AO)</b>	Analog output, voltage mode, 0–10 VDC Analog output, current mode, 4–20 mA	0	2	0
<b>Binary Output (BO)</b>	24 VAC triac	3	3	0
<b>Configurable Output (CO)</b>	Analog output, voltage mode, 0–10 VDC Binary output mode, 24 VAC triac	4	4	4
<b>Relay Outputs (RO)</b>	240 VAC maximum voltage 1/3 hp 125 VAC, 1/2 hp 250 VAC 400 VA Pilot Duty at 240 VAC 200 VA Pilot Duty at 120 VAC 3 A Noninductive 24–240 VAC	0	0	5 (2 x SPDT) (3 x SPST)

**Note:**

Analog input, current mode is set by hardware for the FEC/FAC26 and as software for the FEC16.

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Ordering Codes	Description
<b>MS-FEC1611-0</b>	10-Point Field Equipment Controller with 2 UI, 1 BI, 3 BO and 4 CO; 24 VAC; SA Bus
<b>MS-FEC1621-0</b>	10-Point Field Equipment Controller with 2 UI, 1 BI, 3 BO and 4 CO; 24 VAC; SA Bus; Integral display
<b>MS-FEC2611-0</b>	17-Point Field Equipment Controller with 6 UI, 2 BI, 3 BO, 2 AO and 4 CO; 24 VAC; SA Bus
<b>MS-FEC2621-0</b>	Field Equipment Controller Cover with 6 UI, 2 BI, 3 BO, 2 AO and 4 CO; 24 VAC; SA Bus; Integral display
<b>MS-FAC2611-0</b>	17-Point Advanced Application Field Equipment Controller with 6 UI, 2 BI, 2 AO, 3 BO and 4 CO; 24 VAC; SA Bus
<b>MS-FAC2612-1</b>	18-Point Advanced Application Field Equipment Controller with 5 UI, 4 BI, 4 CO and 5 RO; 24 VAC; SA Bus; Pluggable Terminals
<b>MS-FAC2612-2</b>	18-Point Advanced Application Field Equipment Controller with 5 UI, 4 BI, 4 CO and 5 RO; 120-240 VAC; SA Bus; Pluggable Terminals

#### Accessories

Ordering Codes	Description
<b>MS-DIS1710-0</b>	Local Controller Display for FEC1610 and FEC2610 Models
<b>MS-BTCVT-1</b>	BlueTooth wireless commissioning adaptor
<b>MS-BTCVTCBL-700</b>	Cable replacement Set for the MS-BTCVT-1 includes retractable 5M cable.
<b>AP-TBK4SA-0</b>	Replacement MS/TP SA Bus Terminal, 4-Position Connector, Brown, Bulk Pack
<b>AP-TBK4FC-0</b>	Replacement MS/TP FC Bus Terminal, 4-Position Connector, Blue, Bulk Pack
<b>AP-TBK3PW-0</b>	Replacement Power Terminal, 3-Position Connector, Grey, Bulk Pack
<b>MS-TBKLV03-0</b>	FAC2612, 3 Position Line Voltage Terminal Block. Includes 3 pieces (Grey)
<b>MS-TBKRO02-0</b>	FAC2612, 2 Position Relay Output Terminal Block. Includes 9 pieces, 3 of each position (Red)
<b>MS-TBKRO03-0</b>	FAC2612, 3 Position Relay Output Terminal Block. Includes 6 pieces, 3 of each position (Red)
<b>MS-TBKCO04-0</b>	FAC2612, 4 Position Configurable Output Terminal Block. Includes 6 pieces, 3 of each position (Black)
<b>MS-TBKUI04-0</b>	FAC2612, 4 Position Universal Input Terminal Block. Includes 9 pieces, 3 of each position (White)
<b>MS-TBKUI05-0</b>	FAC2612, 5 Position Universal Input Terminal Block. Includes 3 pieces (White)
<b>MS-ZFR1810-0</b>	Wireless Field Bus Coordinator, 10 mW Transmission Power. Functions with NAE35xx, NAE45xx, NAE55xx, and NCE25xx models.
<b>MS-ZFR1811-0</b>	Wireless Field Bus Router, 10 mW Transmission Power. Functions with Metasys BACnet FECs, VMA1600s, and WRZ-TTx Series Wireless Mesh Room Temperature Sensors.
<b>MS-ZFRCBL-0</b>	Wire Harness for use with ZFR1811 Router. Allows ZFR1811 Router to function with FEC1621; and with FEC1611, VMA1610, or VMA1620 controllers in conjunction with NS Series Sensors. Wireless Commissioning Converter, or DIS1710 Local Controller Display.

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#### FEC - Technical Specifications

<b>Supply Voltage</b>	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Safety Extra-Low Voltage (SELV) (Europe)
<b>Power Consumption</b>	14 VA maximum for FEC1611 and FEC2611 (no integral display) 20 VA maximum for FEC1621 and FEC2621 (with integral display) <b>Note:</b> VA ratings do not include any power supplied to the peripheral devices connected to Binary Outputs (BOs) or Configurable Outputs (COs), which can consume up to 12 VA for each BO or CO, for a possible total consumption of an additional 84 VA (maximum).
<b>Ambient Conditions</b>	
<i>Operating</i>	0 to 50°C; 10 to 90% RH noncondensing
<i>Storage Temperature</i>	-40 to 80°C; 5 to 95% RH noncondensing
<b>Controller Addressing</b>	DIP switch set; valid field controller device addresses 4–127 (Device addresses 0–3 and 128–255 are reserved and not valid field controller addresses.)
<b>Communications Bus</b>	BACnet® MS/TP, RS-485: 3-wire FC Bus between the supervisory controller and field controllers 4-wire SA Bus between field controller, network sensors, and other sensor/actuator devices, includes a lead to source 15 VDC supply power (from field controller) to bus devices.
<b>Processor</b>	H8SX/166xR Renesas® microcontroller
<b>Memory</b>	1 MB flash memory and 512 KB Random Access Memory (RAM)
<b>Input and Output Capabilities</b>	
<i>FEC16 Models</i>	2 - Universal inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm or binary dry contact 1 - Binary inputs: Defined as dry contact maintained or pulse counter/accumulator mode 3 - Binary outputs: Defined as 24 VAC triac (selectable internal or external source power) 4 - Configurable outputs: Defined as 0–10 VDC or 24 VAC triac BO
<i>FEC26 Models</i>	6 - Universal inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm or binary dry contact 2 - Binary inputs: Defined as dry contact maintained or pulse counter/accumulator mode 3 - Binary outputs: Defined as 24 VAC triac (selectable internal or external source power) 4 - Configurable outputs: Defined as 0–10 VDC or 24 VAC triac BO 2 - Analog outputs: Defined as 0–10 VDC or 4–20 mA
<b>Analog Input/Analog Output Resolution and Accuracy</b>	Analog input: 16-bit resolution Analog output: 16-bit resolution and ±200 mV in 0–10 VDC applications
<b>Terminations</b>	Input/output: Fixed screw terminal blocks FC Bus, SA Bus and power supply: 3-wire and 4-wire pluggable screw terminal blocks FC Bus and SA Bus: RJ-12 6-pin modular jacks
<b>Mounting</b>	Horizontal on single 35 mm DIN rail mount (preferred) or screw mount on flat surface with three integral mounting clips on controller
<b>Housing</b>	Enclosure material: ABS and polycarbonate UL94 5VB; Self-extinguishing, plenum-rated protection class: IP20 (IEC529)
<b>Dimensions (H x W x D)</b>	
<i>FEC16 Models</i>	150 x 164 x 53 mm including terminals and mounting clips
<i>FEC26 Models</i>	150 x 190 x 53 mm including terminals and mounting clips <b>Note:</b> Mounting space for FEC16 and FEC26 models requires an additional 50 mm space on top, bottom, and front face of controller for easy cover removal, ventilation and wire terminations.
<b>Weight</b>	
<i>FEC16 Models</i>	0.4 kg
<i>FEC26 Models</i>	0.5 kg
<b>Compliance</b>	
<i>Europe</i>	CE Mark, EMC Directive 2004/108/EC, in accordance with EN 61000-6-3 (2007) Generic Emission Standard for Residential and Light Industry and EN 61000-6-2 (2005) Generic Immunity Standard for Heavy Industrial Environment <b>Note:</b> For FEC26 models, conducted RF immunity within EN 61000-6-2 meets performance criteria B.
<i>BACnet International</i>	BACnet Testing Laboratories (BTL) 135-2004 Listed BACnet Application Specific Controller (B-ASC)

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#### FAC - Technical Specifications

<b>Supply Voltage</b>	
<i>FAC2611-0 and FAC2612-1</i>	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Safety Extra-Low Voltage (SELV) (Europe)
<i>MS-FAC2612-2</i>	100 to 250 VAC, 50/60 Hz
<b>Power Consumption</b>	
	25 VA maximum <b>Note:</b> VA ratings do not include any power supplied to the peripheral devices connected to Binary Outputs (BOs) or Configurable Outputs (COs), which can consume up to 12 VA for each BO or CO; for a possible total consumption of an additional 84 VA (maximum).
<b>Ambient Conditions</b>	
<i>Operating</i>	0 to 50°C; 10 to 90% RH noncondensing
<i>Storage</i>	-40 to 80°C; 5 to 95% RH noncondensing
<b>Controller Addressing</b>	
	DIP switch set; valid field controller device addresses 4–127 (Device addresses 0–3 and 128–255 are reserved and not valid field controller addresses)
<b>Communications Bus</b>	
	BACnet® MS/TP, RS-485: 3-wire FC Bus between the supervisory controller and field controllers. 4-wire SA Bus between field controller, network sensors, and other sensor/actuator devices, includes a lead to source 15 VDC supply power (from field controller) to bus devices.
<b>Processor</b>	
	H8SX/166xR Renesas® microcontroller
<b>Memory</b>	
	4 MB Flash Memory and 1 MB Random Access Memory (RAM)
<b>Input and Output Capabilities</b>	
<i>FAC2611-0</i>	6 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 2 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode 2 - Analog Outputs: Defined as 0–10 VDC or 4–20 mA 3 - Binary Outputs: Defined as 24 VAC Triac (selectable internal or external source power) 4 - Configurable Outputs: Defined as 0–10 VDC or 24 VAC Triac BO
<i>FAC2612-1 and FAC2612-2</i>	5 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm, or Binary Dry Contact 4 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode 4 - Configurable Outputs: Defined as 0–10 VDC or 24 VAC Triac BO 2 - Relay Outputs: (Single-Pole, Double-Throw) Rated as: 240 VAC maximum voltage 1/3 hp 125 VAC, 1/2 hp 250 VAC 400 VA Pilot Duty at 240 VAC 200 VA Pilot Duty at 120 VAC 3 A Noninductive 24–240 VAC 3 - Relay Outputs: (Single-Pole, Single-Throw) Rated as: 240 VAC maximum voltage 1/3 hp 125 VAC, 1/2 hp 250 VAC 400 VA Pilot Duty at 240 VAC 200 VA Pilot Duty at 120 VAC 3 A Noninductive 24–240 VAC
<b>Analog Input/Analog Output Resolution and Accuracy</b>	
	Analog Input: 16-bit resolution Analog Output: 16-bit resolution and ±200 mV in 0–10 VDC applications
<b>Terminations</b>	
	Input/Output: Fixed Screw Terminal Blocks (FAC2611) Pluggable Terminal Blocks (FAC2612) FC Bus, SA Bus, and Supply Power: 3-Wire and 4-Wire Pluggable Screw Terminal Blocks FC Bus and SA Bus: RJ-12 6-Pin Modular Jacks
<b>Mounting</b>	
	Horizontal on single 35 mm DIN rail mount (preferred), or screw mount on flat surface with three integral mounting clips on controller
<b>Housing</b>	
	Enclosure material: ABS and polycarbonate UL94 5VB; Self-extinguishing, Plenum Rated. Protection Class: IP20 (IEC529)
<b>Dimensions (H x W x D)</b>	
<i>FAC2611-0</i>	150 x 190 x 53 mm including terminals and mounting clips
<i>FAC2612-x</i>	150 x 164 x 53 mm including terminals and mounting clips <b>Note:</b> Mounting space for FAC26 models requires an additional 50 mm space on top, bottom, and front face of controller for easy cover removal, ventilation, and wire terminations.
<b>Weight</b>	
	0.5 kg
<b>Compliance</b>	
<i>Europe</i>	CE Mark – Johnson Controls, Inc., declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC.
<i>BACnet International</i>	BACnet Testing Laboratories™ (BTL) 135-2004 Listed BACnet Advanced Application Controller (B-AAC)