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# Field Equipment Controller (FEC) Series

## Description

The FEC is a programmable digital controller that communicates via BACnet® Master-Slave/Token Passing (MS/TP) protocol. The controllers featured in this family are the 10-point FEC16x0 and the 17-point FEC26x0. Some models also feature a built-in Liquid Crystal Display (LCD) screen that serves as a local user interface to the application in the device.

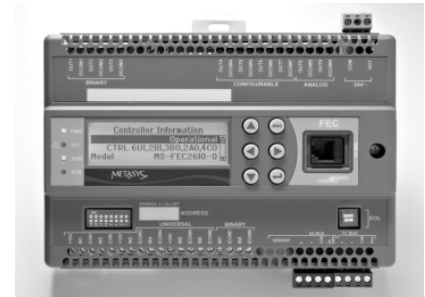
A full range of FEC models combined with the Input/Output Module (IOM) models can be applied to a wide variety of building applications ranging from simple fan coil or heat pump control, to advanced central plant management.

Refer to the *Metasys System Field Equipment Controllers, Network Sensors, and Related Products Product Bulletin (LIT-12011042)* for important product application information.

## Features

- Continuous loop tuning provided by patented proportional adaptive control (P-Adaptive) and Pattern Recognition Adaptive Control (PRAC) technologies.
- BACnet MS/TP communication provides open system compatibility.

- Writable flash memory allows you to download standard or customized applications from the Controller Configuration Tool (CCT) software.
- Removable base allows the base to be ordered, mounted, and pre-wired without the controller electronics.
- Universal and configurable inputs and outputs support multiple signal options and increase controller application flexibility.
- Different models provide a wide range of point mix to meet application requirements and allow for the addition of one or more Input/Output Modules (IOMs) and/or Network Sensors to provide even more application capacity.
- Ability to be automatically discovered by Network Automation Engines (NAEs) and Network Control Engines (NCEs) allows for easy controller integration.
- Local user interface display option (integral display or stand-alone display)



**FEC2620**

- Wireless capabilities via ZFR1800 Series Wireless Field Bus System enable wireless mesh connectivity between FECs to WRZ Series Wireless Room Temperature Sensors, and to NAE/NCE devices. This facilitates easy initial location and relocation.

## Repair Information

If the Field Equipment Controller fails to operate within its specifications, replace the unit. For a replacement FEC, contact the nearest Johnson Controls® representative.

## Selection Charts

### Point Type Counts per Model

Point Types	Signals Accepted	FEC1610	FEC2610
		FEC1620	FEC2620
<b>Universal Input (UI)</b>	Analog Input, Voltage Mode, 0 - 10 VDC; Analog Input, Current Mode, 4 - 20 mA; 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
<b>Binary Input (BI)</b>	Dry Contact Maintained Mode; Pulse Counter Mode (High Speed), 100 Hz	1	2
<b>Analog Output (AO)</b>	Analog Output, Voltage Mode, 0 - 10 VDC; Analog Output, Current Mode, 4 - 20 mA	0	2
<b>Binary Output (BO)</b>	24 VAC Triac	3	3
<b>Configurable Output (CO)</b>	Analog Output, Voltage Mode, 0 - 10 VDC; Binary Output Mode, 24 VAC Triac	4	4

## Field Equipment Controller (FEC) Series (Continued)

The FEC (MS-FEUx610-0) consists of two parts, which are also available separately: mounting base (MS-FEBx610-0) and the controller cover (MS-FECx6x0-0). FEU = FEB + FEC.

### Ordering Information

Product Code Number	Description
MS-FEU1610-0	10-Point Field Equipment Controller with 2 UI, 1 BI, 3 BO, and 4 CO; 24 VAC; SA Bus; Mounting Base
MS-FEU1610-0U	10-Point Field Equipment Controller with 2 UI, 1 BI, 3 BO, and 4 CO; 24 VAC; SA Bus; Mounting Base Note: This model is UL Listed, File S4977, UUKL 864 - 9th Edition, Smoke Control Equipment.
MS-FEC1610-0	Field Equipment Controller Cover with 2 UI, 1 BI, 3 BO, and 4 CO; 24 VAC; SA Bus
MS-FEB1610-0	Triac Mounting Base for FEC16x0
MS-FEU1620-0	10-Point Field Equipment Controller with 2 UI, 1 BI, 3 BO, and 4 CO; 24 VAC; SA Bus; Mounting Base; Integral Display
MS-FEU1620-0U	10-Point Field Equipment Controller with 2 UI, 1 BI, 3 BO, and 4 CO; 24 VAC; SA Bus; Mounting Base; Integral Display Note: This model is UL Listed, File S4977, UUKL 864 - 9th Edition, Smoke Control Equipment.
MS-FEC1620-0	Field Equipment Controller Cover with 2 UI, 1 BI, 3 BO, and 4 CO; 24 VAC; SA Bus; Integral Display
MS-FEU2610-0	17-Point Field Equipment Controller with 6 UI, 2 BI, 3 BO, 2 AO, and 4 CO; 24 VAC; SA Bus; Mounting Base
MS-FEU2610-0U	17-Point Field Equipment Controller with 6 UI, 2 BI, 3 BO, 2 AO, and 4 CO; 24 VAC; SA Bus; Mounting Base Note: This model is UL Listed, File S4977, UUKL 864 - 9th Edition, Smoke Control Equipment.
MS-FEC2610-0	Field Equipment Controller Cover with 6 UI, 2 BI, 3 BO, 2 AO, and 4 CO; 24 VAC; SA Bus
MS-FEB2610-0	Triac Mounting Base for FEC26x0
MS-FEC2620-0	17-Point Field Equipment Controller with 6 UI, 2 BI, 3 BO, 2 AO and 4 CO; 24 VAC; SA Bus; Integral Display
MS-FEU2620-0	Field Equipment Controller Cover with 6 UI, 2 BI, 3 BO, 2 AO, and 4 CO; 24 VAC; SA Bus; Mounting Base; Integral Display
MS-FEU2620-0U	Field Equipment Controller Cover with 6 UI, 2 BI, 3 BO, 2 AO, and 4 CO; 24 VAC; SA Bus; Mounting Base; Integral Display Note: This model is UL Listed, File S4977, UUKL 864 - 9th Edition, Smoke Control Equipment.

### Accessories

Product Code Number	Description
Y64T15-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 92 VA, Foot Mount, 30 in. Primary Leads and 30 in. Secondary Leads, Class 2
Y65A13-0	Transformer, 120 VAC Primary to 24 VAC Secondary, 40 VA, Foot Mount [Y65AS], 8 in. Primary Leads and 30 in. Secondary Leads, Class 2
Y65T42-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 40 VA, Hub Mount [Y65SP+], 8 in. Primary Leads and Secondary Screw Terminals, Class 2
Y65T31-0	Transformer, 120/208/240 VAC Primary to 24 VAC Secondary, 40 VA, Foot Mount [Y65AR+], 8 in. Primary Leads and Secondary Screw Terminals, Class 2
AP-TBK4SA-0	Replacement MS/TP SA Bus Terminal, 4 Position Connector, Brown, Bulk Pack
AP-TBK4FC-0	Replacement MS/TP FC Bus Terminal, 4 Position Connector, Blue, Bulk Pack
AP-TBK3PW-0	Replacement Power Terminal, 3 Position Connector, Gray, Bulk Pack
MS-BTCVTCBL-700	Cable replacement Set for the MS-BTCVT-1 or the NS-ATV7003-0; includes one 5-foot retractable cable.
MS-DIS1710-0	Local Controller Display for FEC1610 and FEC2610 Models
MS-ZFR1810-0	Wireless Field Bus Coordinator, 10 mW Transmission Power. Functions with NAE35xx, NAE45xx, NAE55xx, and NCE25xx models.
MS-ZFR1811-0	Wireless Field Bus Router, 10 mW Transmission Power. Functions with Metasys BACnet FECs, VMA1600s, and WRZ-TTx Series Wireless Mesh Room Temperature Sensors.
MS-ZFRCBL-0	Wire Harness for use with MS-ZFR1811-0 Wireless Field Bus Router. Allows ZFR1811 Router to function with FEC1620; and with FEC1610, VMA1610, or VMA1620 controllers in conjunction with NS Series Sensors. Wireless Commissioning Converter, or DIS1710 Local Controller Display.



## Field Equipment Controller (FEC) Series (Continued)

### Technical Specifications

Field Equipment Controller (FEC) Series	
<b>Product Code Numbers</b>	MS-FEC1610-0 - Cover MS-FEB1610-0 - Triac Mounting Base MS-FEU1610-0 - Cover and Triac Mounting Base MS-FEC2610-0 - Cover MS-FEB2610-0 - Triac Mounting Base MS-FEU2610-0 - Cover and Triac Mounting Base MS-FEC1620-0 - Cover with Integral Display MS-FEU1620-0 - Cover with Integral Display and Triac Mounting Base MS-FEC2620-0 - Cover with Integral Display MS-FEU2620-0 - Cover with Integral Display and Triac Mounting Base
<b>Supply Voltage</b>	20 - 30 VAC at 50 or 60 Hz, Class 2 or Safety Extra-Low Voltage (SELV)
<b>Power Consumption</b>	10 VA typical, 14 VA maximum, plus all BO and Configurable Output loads
<b>Ambient Conditions</b>	<b>Operating:</b> 0 to 50°C (32 to 122°F); 10 to 90% RH noncondensing <b>Storage:</b> -40 to 70°C (-40 to 158°F); 10 to 90% RH noncondensing
<b>Terminations</b>	Screw Terminals and Screw Terminal Pluggable Blocks
<b>Controller Addressing</b>	DIP switch set (4-127). Addresses 0-3, 128-255 are reserved.
<b>Communications Bus</b>	BACnet MS/TP; 3-wire FC Bus between the NAE/NCE and other devices. 4-wire SA Bus between network sensors and other devices. <sup>1</sup>
<b>Analog Input/Analog Output Resolution and Accuracy</b>	Analog Input: 16-bit resolution (15 bit on FEx1610) Analog Output: 16-bit resolution and ±200 mV in 0-10 VDC applications
<b>Mounting</b>	On flat surface with screws on three mounting clips or a single 35 mm DIN rail
<b>Compliance</b>	<b>United States:</b> UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment; UL Listed, File S4977, UUKL 864 - 9th Edition, Smoke Control Equipment (MS-FEU16x0-0U and MS-FEU26x0-0U models only) FCC Compliant to CFR47, Part 15, Subpart B, Class A <b>Canada:</b> UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205, Signal Equipment; Industry Canada Compliant, ICES-003 <b>Europe:</b> CE Mark, EMC Directive 89/336/EEC, in accordance with EN 61000-6-3 (2001) Generic Emission Standard for Residential and Light Industry and EN 61000-6-2 (2001) Generic Immunity Standard for Heavy Industrial Environment and the Low Voltage Directive 73/23/EEC in accordance with EN 60730-1 (1999) Automatic electrical controls for household and similar use. <b>Australia and New Zealand:</b> C-Tick Mark, Australia/NZ Emissions Compliant <b>BACnet International:</b> BACnet Testing Laboratories™ (BTL) 135-2004 Listed BACnet Application Specific Controller (B-ASC)
<b>Weight</b>	<b>FEC16x0 Models:</b> 0.5 kg (1.10 lb) <b>FEC26x0 Models:</b> 0.68 kg (1.5 lb)
<b>Dimensions (Height x Width x Depth)</b>	<b>FEC16x0 Models:</b> 144 x 127 x 58 mm (5-11/16 x 5 x 2-1/4 in.) <b>FEC26x0 Models:</b> 180 x 127 x 58 mm (7-1/16 x 5 x 2-1/4 in.)
<b>Housing</b>	Plastic housing Plastic material: ABS + polycarbonate UL 94-5VB Protection: IP20 (IEC 60529)

1. For more information, refer to the *MS/TP Communications Bus Technical Bulletin (LIT-12011034)*.