Metasys® controllers

FEC - FAC

Field Equipment Controllers

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 controllers from 10 to 28 points, as well as I/O expandability. All seamlessly integrate 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.

Some controllers feature selectable N2 or BACnet® MS/TP communication protocol, this allows them to be used as functional replacements for legacy N2 controllers.
Other controllers can communicate on the BACnet/IP protocol.

Features

▶ New model with BACnet/IP protocol
▶ 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	FEC25	FEC2611 and FAC2611	FAC2612	FAC3611	FAC4911
Communication protocol				BACnet® MS/TP, N2			BACnet® IP
Universal Input (UI)	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	4 **1**	6	5	8	10
Binary Input (BI)	Dry contact maintained mode Pulse counter/accumulator mode (high speed) 100 Hz (50 Hz – FEC25, FAC36)	1	6	2	4	6	6
Analog Output (AO)	Analog output, voltage mode, 0–10 VDC Analog output, current mode, 4–20 mA	0	2 **2**	2	0	6	4
Binary Output (BO)	24 VAC triac	3	2	3	0	6	4
Configurable Output (CO)	Analog output, voltage mode, 0–10 VDC Binary output mode, 24 VAC triac	4	2	4	4	0	4
Relay Outputs (RO)	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	0	5 (2 x SPDT) (3 x SPST)	0	0

Note
1 Does not support 4-20 mA input
2 Does not support 4-20 mA output

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Ordering information

Codes	Description
MS-FEC1611-1	10-point Field Equipment Controller with 2 UI, 1 BI, 3 BO and 4 CO; 24 VAC; SA Bus
MS-FEC1621-1	10-point Field Equipment Controller with 2 UI, 1 BI, 3 BO and 4 CO; 24 VAC; SA Bus; Integral display
MS-FEC2511-0	16-point Field Equipment Controller with 4 UI, 6 BI, 2 BO, 2 AO and 2 CO; 24 VAC; SA Bus
MS-FEC2611-0	17-point Field Equipment Controller with 6 UI, 2 BI, 3 BO, 2 AO and 4 CO; 24 VAC; SA Bus
MS-FEC2621-0	17-point Field Controller with 6 UI, 2 BI, 3 BO, 2 AO and 4 CO; 24 VAC; SA Bus; Integral display
MS-FAC2611-0	17-point advanced application Field Equipment Controller with 6 UI, 2 BI, 2 AO, 3 BO and 4 CO; 24 VAC; SA Bus
MS-FAC2612-1	18-point advanced application Field Equipment Controller with 5 UI, 4 BI, 4 CO and 5 RO; 24 VAC; SA Bus; pluggable terminals
MS-FAC2612-2	18-point advanced application Field Equipment Controller with 5 UI, 4 BI, 4 CO and 5 RO; 100-250 VAC; SA Bus; pluggable terminals
MS-FAC3611-0	26-point advanced application Field Controller with 8 UI, 6 BI, 6 AO and 6 BO; 24 VAC; SA Bus
MS-FAC4911-0	28-point advanced application IP Field Controller with 10 UI, 6 BI, 4 BO, 4 AO and 4 CO; 24 VAC; SA Bus

Accessories

Codes	Description
MS-DIS1710-0	Local controller display for FEC and FAC models
MS-BTCVT-1	BlueTooth wireless commissioning adaptor
MS-BTCVTCBL-700	Cable replacement set for the MS-BTCVT-1 includes retractable 5 m cable
TL-BRTRP-0	Portable BACnet/IP to MS/TP Router. Includes 1.8 m cable and 1.5 m Ethernet cable
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, grey, bulk pack
MS-TBKLV03-0	FAC2612, 3 position line voltage Terminal Block. Includes 3 pieces (grey)
MS-TBKRO02-0	FAC2612, 2 position Relay Output Terminal Block. Includes 9 pieces, 3 of each position (red)
MS-TBKRO03-0	FAC2612, 3 position Relay Output Terminal Block. Includes 6 pieces, 3 of each position (red)
MS-TBKCO04-0	FAC2612, 4 position configurable Output Terminal Block. Includes 6 pieces, 3 of each position (black)
MS-TBKUI04-0	FAC2612, 4 position Universal Input Terminal Block. Includes 9 pieces, 3 of each position (white)
MS-TBKUI05-0	FAC2612, 5 position Universal Input Terminal Block. Includes 3 pieces (white)
MS-ZFR1810-1	Wireless Field Bus Coordinator, 10 mW Transmission Power. Functions with NAE35xx, NAE45xx, NAE55xx and NCE25xx models.
MS-ZFR1811-1	Wireless Field Bus Router, 10 mW Transmission Power. Functions with Metasys BACnet FECs, VMA1600s and WRZ-TTx Series Wireless Mesh Room Temperature Sensors.
ZFR-USBHA-0	USB Dongle with ZigBee™ Driver provides a wireless connection through CCT to allow wireless commissioning of the wireless enabled FEC, FAC, IOM, and VMA16 field controllers. Also allows use of the ZFR Checkout Tool (ZCT) in CCT

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FEC - FAC

Technical specifications

FEC

Supply voltage	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Safety Extra-Low Voltage (SELV) (Europe)
Power consumption	14 VA maximum for FEC models with no integral display 20 VA maximum for FEC models with integral display **Note:** 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).
Ambient conditions	
Operating	0 to 50°C; 10 to 90% RH noncondensing (–xET models –40 to 70°C; 10 to 90% RH noncondensing)
Storage temperature	–40 to 80°C; 5 to 95% RH noncondensing
Controller addressing	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.)
Communications bus	Selectable N2 or 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.
Processor	H8SX/166xR Renesas® microcontroller
Memory	1 MB flash memory and 512 KB Random Access Memory (RAM)
Input and output capabilities	
FEC16 model	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
FEC25 model	4 – Universal inputs: Defined as 0–10 VDC, 0–600k ohm or binary dry contact 6 – Binary inputs: Defined as dry contact maintained or pulse counter/accumulator mode 2 – Binary outputs: Defined as 24 VAC triac (external source power only) 2 – Configurable outputs: Defined as 0–10 VDC or 24 VAC triac BO 2 – Analog outputs: Defined as 0–10 VDC only
FEC26 model	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
Analog input/analog output resolution and accuracy	Analog input: 16-bit resolution Analog output: 16-bit resolution and ±200 mV in 0–10 VDC applications
Terminations	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
Mounting	Horizontal on single 35 mm DIN rail mount (preferred) or screw mount on flat surface with three integral mounting clips on controller
Housing	Enclosure material: ABS and polycarbonate UL94 5VB; Self-extinguishing, plenum-rated protection class: IP20 (IEC529)
Dimensions (H x W x D)	
FEC16/25 model	150 x 164 x 53 mm including terminals and mounting clips
FEC2611 model	150 x 190 x 53 mm including terminals and mounting clips
	Note: Mounting space for FAC models requires an additional 50 mm space on top, bottom, and front face of controller for easy cover removal, ventilation, and wire terminations.
Weight	
FEC16/25 model	0.4 kg
FEC2611 model	0.5 kg
CE Compliance	Johnson Controls declares that these products are in compliance with the essential requirements and other relevant provisions of the EMC Directive and Low Voltage Directive.

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FEC – FAC

Technical specifications

FAC – (Part 1/2)

Engines Supported	
FAC2611, FAC2612 and FAC3611	All Models except NIEs
FAC4911	NAE55, NAE85, ODS
Supply voltage	
FAC2611, FAC3611, FAC4911 and FAC2612-1	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Safety Extra-Low Voltage (SELV) (Europe)
FAC2612-2	100 to 240 VAC, 50/60 Hz
Power consumption	
FAC2611, FAC3611 and FAC4911	14 VA maximum
FAC2612-1	30 VA maximum
FAC2612-2	40 VA maximum
	Note: 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).
Ambient conditions	
Operating	0 to 50°C; 10 to 90% RH noncondensing
Storage	−40 to 80°C; 5 to 95% RH noncondensing
Controller addressing	
BACnet MS/TP-configured controllers	DIP switch set; valid field controller device addresses 4–127 (device addresses 0–3 and 128–255 are reserved)
BACnet/IP controllers	3 rotary switches to assign unique number for each controller on the subnet to identify it in the Controller Tool for uploading, downloading, and commissioning
N2-configured controllers	DIP switch set; valid control device addresses 1–255
Communications bus	
FAC2611, FAC2612, FAC3611	RS-485, field selectable between BACnet Master–Slave/Token-Passing (MS/TP) and N2 communications: • 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.
FAC4911	• BACnet/IP over Ethernet cable • 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.
Processor	
FAC2611 and FAC2612	H8SX/166xR Renesas® microcontroller
FAC3611	RX630 32-Bit Renesas microcontroller
FAC4911	RX63N 32-Bit Renesas microcontroller
Memory	
FAC2611, FAC2612 and FAC3611	4 MB Flash Memory and 1 MB RAM
FAC4911	16 MB Flash Memory and 8 MB RAM

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Technical specifications

FAC - (Part 2/2)

Input and output capabilities		
	FAC2611 model	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
	FAC2612 models	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
		5 - Relay outputs: Defined as maximum 3A noninductive at 24-240VAC, 2 x SPDT and 3 x SPST
		4 - Configurable outputs: Defined as 0–10 VDC or 24 VAC triac BO
	FAC3611 model	8 - Universal inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohm or binary dry contact
		6 - Binary inputs: Defined as dry contact maintained or pulse counter/accumulator mode
		6 - Binary outputs: Defined as 24 VAC triac (selectable internal or external source power)
		6 - Analog outputs: Defined as 0–10 VDC or 4–20 mA
	FAC4911 model	10 - Universal Inputs: Defined as 0–10 VDC, 4–20 mA, 0–600k ohms, or Binary Dry Contact
		6 - Binary Inputs: Defined as Dry Contact Maintained or Pulse Counter/Accumulator Mode
		4 - Binary Outputs: Defined as 24 VAC Triac (external power source only)
		4 - Analog Outputs: Defined as 0–10 VDC or 4–20 mA
		4 - Configurable Outputs: Defined as AO mode , 0-10 VDC or BO mode, 24 VAC Triac
Analog input/analog output Resolution and Accuracy		Analog input: 16-bit resolution
		Analog output: 16-bit resolution and ±200 mV in 0–10 VDC applications
Terminations		Input/output: Fixed Screw Terminal Blocks (FAC2611, FAC3611 and FAC4911) 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
Mounting		Horizontal on single 35 mm DIN rail mount (preferred), or screw mount on flat surface with three integral mounting clips on controller
Housing		Enclosure material: ABS and polycarbonate UL94 5VB; Self-extinguishing, Plenum Rated.
		Protection Class: IP20 (IEC529)
Dimensions (H x W x D)		
	FAC2611	150 x 190 x 53 mm including terminals and mounting clips
	FAC2612	150 x 164 x 53 mm including terminals and mounting clips
	FAC3611 and FAC4911	150 x 220 x 57.5 mm including terminals and mounting clips
		Note: Mounting space for FAC models requires an additional 50 mm space on top, bottom and front face of controller for easy cover removal, ventilation, and wire terminations.
Weight		0.5 kg
CE Compliance		Johnson Controls declares that these products are in compliance with the essential requirements and other relevant provisions of the EMC Directive and Low Voltage Directive.