FX-PCG General Purpose Programmable Controllers Catalog Page

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The FX-PCG Series devices are programmable controllers that can be combined with the FX-PCX Expansion I/O Modules to monitor and control a wide variety of HVAC equipment, ranging from simple fan coils or heat pumps to air handling units to advanced central plants.

FX-PCG controllers support software selectable BACnet® MS/TP or N2 field bus networking. FX-PCG controllers also support wireless field bus networking and sensing using modular, add-on accessories.

FX-PCG controllers feature 32-bit microprocessors, patented continuous tuning adaptive control logic, peer-to-peer communications, and are available with an optional built-in LCD keypad and display.

Refer to the *FX-PC Series Programmable Controllers and Related Products Product Bulletin (LIT-12011657)* or *FX-PC Series Programmable Controllers and Related Products for Building Control Management (BCM) System Product Bulletin (LIT-12011915)* for product application details.

Features

- Standard BACnet® Protocol with BTL Listing - Provides interoperability with Johnson Controls® and third-party Building Automation System (BAS) products that use the widely accepted BACnet standard.
- Selectable BACnet MS/TP or N2 Field Bus Networking Protocol - Provides a new capability at FX-PCT Release 10.1 that allows FX-PCVs, FX-PCGs, and FX-PCAs to be configured to communicate using either the BACnet or the N2 field bus networking protocol.
- Standard Hardware and Software Platform - Uses a common hardware design throughout the family line to support standardized wiring practices and installation workflows. Also uses a common software design to support use of a single tool for control applications, commissioning, and troubleshooting to minimize technical training.
- ZigBee® Wireless Field Controller (FC)/Sensor/Actuator (SA) Bus Interface (where available) - Provides a wireless alternative to hard-wired field bus networking and sensor connections, providing application flexibility, mobility, and minimal disruption to building occupants.
- State-Based Application Control Logic with Adaptive, Automatically Tuned Control Loops - Prevents simultaneous heating and cooling, reduces commissioning time, eliminates change-of-season re-commissioning, and reduces wear and tear on mechanical devices.
- Universal Inputs and Configurable Outputs - Allow multiple signal options per channel to provide input/output flexibility.
- Complete Product Family with Modular Components - Meets any HVAC equipment or building system control requirement using only the needed components.
- BACnet MS/TP Protocol supports seamless integration into Johnson Controls and third-party BACnet devices.
- Integral end-of-line (EOL) switch enables FX-PC controller as a terminating device on the communications bus.
- Wireless capabilities (where available) via an FX-ZFR Series Wireless Field Bus System enable wireless mesh connectivity between FX-PC controllers to FX-WRZ Series Wireless Room Temperature Sensors and to supervisory controllers, facilitating easy initial location and relocation.
- Patented technologies including Proportional Varying Deadzone Control (PVDC), Pattern Recognition Adaptive Control (PRAC+), and Pulse Modulation Adaptive Control (PMAC) provide continuous loop tuning.
- Writable flash memory allows standard or customized applications to be downloaded from the FX-PCT and enables persistent application data.
- Large product family provides a wide range of point mix to meet application requirements and allows for the addition of one or more FX-PCXs or NS Series Network Sensors to provide even more I/O capacity.

If the product fails to operate within its specifications, replace the product. For a replacement product, contact the nearest Johnson Controls® representative.

Figure 1: FX-PCG2621 General Purpose Programmable Controller with Integral Local Display

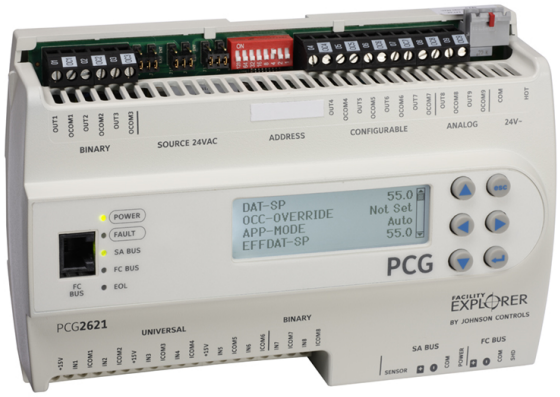

Table 1: FX-PCG Series Point Type Counts per Model

Point Types	Signals Accepted	FX-PCG16	FX-PCG26
Universal Input (UI)	Analog Input, Voltage Mode, 0–10 VDC Analog Input, Current Mode, 4–20 mA[1] Analog Input, Resistive Mode, 0–2k ohm, resistence temperature detector (RTD) (1k NI [Johnson Controls], 1k PT, A99B SI), negative temperature coefficient (NTC) (10k Type L, 2.252k Type 2) Binary Input, Dry Contact Maintained Mode	2	6
Binary Input (BI)	Dry Contact Maintained Mode Pulse Counter/Accumulator Mode (High Speed), 100 Hz	1	2
Analog Output (AO)	Analog Output, Voltage Mode, 0–10 VDC Analog Output, Current Mode, 4–20 mA		2
Binary Output (BO)	24 VAC Triac	3	3
Configurable Output (CO)	Analog Output, Voltage Mode, 0–10 VDC Binary Output Mode, 24 VAC Triac	4	4

1 Analog Input, Current Mode is set by hardware for the FX-PCG26, and by software for the FX-PCG16.

Table 2: FX-PCG Series Ordering Information

Product Code Number	Description
FX-PCG1611-1	10-Point General Purpose Programmable Controller with 2 UI, 1 BI, 3 BO, and 4 CO; 24 VAC; FC and SA Bus Support
FX-PCG1611-1ET	FX-PCG1611 Extended Temperature controller for rooftop applications. Supports Operational Temperature Range of -40 to 70°C.
FX-PCG1621-1	10-Point General Purpose Programmable Controller with 2 UI, 1 BI, 3 BO, and 4 CO; 24 VAC; FC and SA Bus Support; Intregral Display with Push Button User Interface
FX-PCG2611-0	17-Point General Purpose Programmable Controller with 6 UI, 2 BI, 3 BO, 2 AO, and 4 CO; 24 VAC; FC and SA Bus Support
FX-PCG2611-0ET	FX-PCG2611 Extended Temperature controller for rooftop applications. Supports Operational Temperature Range of -40 to 70°C.
FX-PCG2621-0	17-Point General Purpose Programmable Controller with 6 UI, 2 BI, 3 BO, 2 AO, and 4 CO; 24 VAC; FC and SA Bus Support; Integral Display and Push Button User Interface

Accessories

Table 3: FX-PCG Accessories

Product Code Number	Description
FX-DIS1710-0	Local Controller Display. Text only available in English.
FX-BTCVT-1	Bluetooth® Commissioning Converter
TL-BRTRP-0	Portable BACnet/IP to MS/TP Router
FX-ATV7003-0	Handheld VAV Box Balancing Tool
FX-ZFR1810-1	Wireless Field Bus Coordinator, 10 mW Transmission Power. Functions with FX Supervisory Controllers.
FX-ZFR1811-1	Wireless Field Bus Router, 10 mW Transmission Power. Functions with FX-PC controllers and FX-WRZxxx Series Wireless Sensors
FX-BTCVTCBL-700	Cable Replacement Set for the FX-BTCVT-1 or the FX-ATV7003-0; Includes One 5 ft (1.5 m) Retractable Cable
FX-WRZ Series Wireless Sensors	FX-WRZ Series Wireless Sensors: Refer to the *FX-WRZ Series Wireless Room Sensors Product Bulletin (LIT-12011687)* for specific sensor model descriptions.
NS Series Sensors	NS Series Network Sensors: Refer to the *NS Series Network Sensors Product Bulletin (LIT-12011574)* for specific sensor model descriptions.
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	AP-TBK3PW-0

Table 3: FX-PCG Accessories

Product Code Number	Description
TE730-29C-0	Network Sensor Wall Plate
TE730-29C-0	Platinum 1k ohm Thin Film Resistive Temperature Sensor
TE730-39C-0	Platinum 1k ohm Thin Film Resistive Temperature Sensor with Integral Manual Occupancy Override Push Button
FX-WRZ7860-0	One-to-One ZigBee Wireless Receiver for Wireless Sensor Only Applications
FX-WRZSST-120	Wireless Sensing System Tool Kit
ZFR-USBHA	The ZFR-USBHA-0 replaces the IA OEM DAUBI_2400 ZigBee USB dongle. For additional information on the ZFR-USBHA-0 ZigBee dongle, refer to the *FX-ZFR Series Wireless Field Bus System Technical Bulletin (LIT-12011660)* or *FX-ZFR Series Wireless Field Bus System Quick Reference Guide (LIT-12011696)*. USB Dongle with ZigBee® Driver provides a wireless connection through FX-PCT to allow wireless commissioning of the wirelessly enabled FX-PCA, FX-PCG, FX-PCV, and FX-PCX programmable controllers. Also allows use of the FX-ZFR Checkout Tool (FX-ZCT) in FX-PCT.

FX-PCG Series Technical Specifications

Table 4: FX-PCG Series Technical Specifications

Product Code Numbers	**FX-PCG1611-1** – 10-Point General Purpose Programmable Controller **FX-PCG1621-1** – 10-Point General Purpose Programmable Controller with Integral Display and Push Button User Interface **FX-PCG2611-0** – 17-Point General Purpose Programmable Controller **FX-PCG2621-0** – 17-Point General Purpose Programmable Controller with Integral Display and Push Button User Interface
Supply Voltage	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Power Supply Class 2 (North America), Safety, Extra-Low Voltage (SELV) (Europe)
Power Consumption	14 VA maximum for FX-PCG1611 and FX-PCG2611 (no integral display) 20 VA maximum for FX-PCG1621 and FX-PCG2621 (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 (32 to 122°F); 10 to 90% RH noncondensing **Storage:** -40 to 80°C (-40 to 176°F); 5 to 95% RH noncondensing **Note:** FX-PCG models with an -0ET suffix have an operating temperature range of -40 to 70°C (-40 to 158°F).
Controller Addressing	**BACnet/MSTP Controller** DIP switch set; valid controller device addresses 4–127 (Device addresses 0–3 and 128–255 are reserved and not valid controller addresses.) **N2** DIP switch set; valid controller device addresses 1–255
Communications Bus[1]	**RS-485, software selectable between BACnet MS/TP or N2:** 3-wire FC Bus between the supervisory controller and FX-PC controllers 4-wire SA Bus between FX-PC controller, NS Series Network Sensors, and other sensor/actuator devices, includes a lead to source 15 VDC supply power (from FX-PC controller) to bus devices
Processor	H8SX/166xR Renesas® microcontroller
Memory	1 MB Flash Memory and 512 KB Random Access Memory (RAM)

Table 4: FX-PCG Series Technical Specifications

Input and Output Capabilities	**FX-PCG16 Models:** 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 **FX-PCG26 Models:** 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 Supply Power: 3-wire and 4-wire Pluggable Screw Terminal Blocks FC Bus Port and Sensor Port: 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 (Height x Width x Depth)	**FX-PCG16 Models:** 150 x 164 x 53 mm (5-7/8 x 6-7/16 x 2-1/8 in.) including terminals and mounting clips **FX-PCG26 Models:** 150 x 190 x 53 mm (5-7/8 x 7-1/2 x 2-1/8 in.) including terminals and mounting clips **Note:** Mounting space for all FX-PC controllers requires an additional 50 mm (2 in.) space on top, bottom, and front face of controller for easy cover removal, ventilation, and wire terminations.
Weight	**FX-PCG16 Models:** 0.4 kg (0.9 lb) **FX-PCG26 Models:** 0.5 kg (1.1 lb)
Compliance	**United States:** UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment
	Canada: UL Listed, File E107041, CCN PAZX7, CAN/CSA C22.2 No. 205, Signal Equipment; Industry Canada Compliant, ICES-003
	Europe: 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.
	Australia and New Zealand: C-Tick Mark, Australia/NZ Emissions Compliant
	BACnet International: BACnet Testing Laboratories (BTL) Protocol Revision 4 Listed BACnet Application Specific Controller (B-ASC)

1 For more information, refer to the *FX-PC Series Controllers MS/TP Communications Bus Technical Bulletin (LIT-12011670)*.

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