

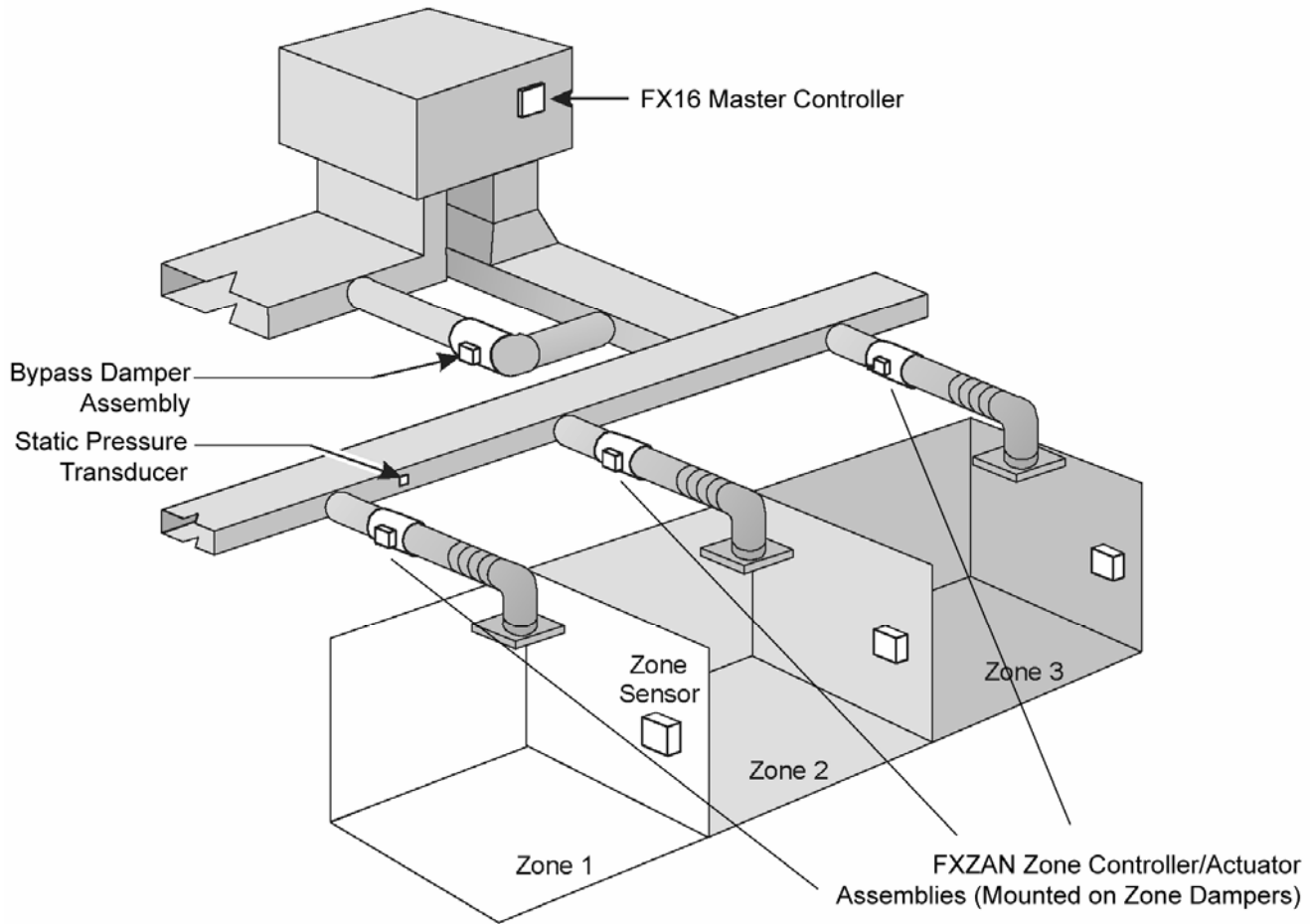
# Commercial Zoning Control Package

*The Facility Explorer Commercial Zoning Control Package is a complete, turnkey control system used to improve occupant comfort in a building (or section of a building) that is conditioned with a packaged Heating, Ventilating, and Air Conditioning (HVAC) air handling unit feeding several areas of dissimilar heating and cooling demands. The system consists of an FX16 Master Controller, integrated damper/controller/actuator assemblies, application software, and other ancillary control devices, such as sensors and switches, all working together in a coordinated control system.*



**Figure 1: Commercial Zoning Control Package**

<b>Features and Benefits</b>	
<input type="checkbox"/> <b>Controls Standard Packaged HVAC Units, Regardless of Manufacturer</b>	Well suited for both new and retrofit applications
<input type="checkbox"/> <b>Integrated Assemblies with Factory-Installed Components</b>	Saves installation time
<input type="checkbox"/> <b>Each Zone Controller/Actuator Assembly Contains a Built-in User Interface</b>	Eases installation and commissioning of the zone damper assembly and provides ongoing diagnostic information once installed
<input type="checkbox"/> <b>Optional System User Interface</b>	Provides on-site monitoring, setup, and adjustment capabilities, all without a laptop
<input type="checkbox"/> <b>Adjustable Control Parameters</b>	Allow installer to optimize control performance



**Figure 2: Facility Explorer Commercial Zoning Control Package**

## Operation

A packaged HVAC air-handling unit (for example, a rooftop unit) typically provides either heated or cooled air to the supply duct. Occupant comfort suffers when this type of equipment is used to condition several areas or zones of dissimilar heating and cooling demands. The Facility Explorer Commercial Zoning Control Package improves occupant comfort by:

- intelligently controlling the rooftop unit's mode of operation (heating, cooling, or venting)
- modulating the amount of conditioned air delivered to each individual zone
- maintaining proper duct static pressure by either bypassing supply air to the return duct or by varying the supply fan speed
- optionally providing auxiliary zone heating

## Components

### FX16 Master Controller



**Figure 3: FX16 Master Controller**

One FX16 Master Controller is required for every rooftop unit in the zoning system. The LP-FX16X01-xxx is a low ambient temperature rated controller that you can order with or without the pre-downloaded zoning application software.

The FX16:

- controls the rooftop unit's heating and cooling stages. The FX16 supports up to four stages each of heating and cooling, or modulating heating and cooling.
- controls the rooftop unit's supply fan
- controls the rooftop unit's outdoor air damper to provide economizer and ventilation functions. The FX16 supports dry bulb, dual dry bulb, and single- or dual-enthalpy economizer switchover strategies.
- controls the supply duct static pressure by providing a modulating output to operate a bypass damper/actuator assembly or a variable fan speed drive
- downloads each zone controller with its corresponding portion of the zoning system application software
- polls each zone controller for its zone demand to determine the rooftop unit's proper mode of operation (heating, cooling, or venting)

### Zone Damper/Controller/Actuator Assemblies



**Figure 4: RZG Round Zone Damper/Controller/Actuator Assembly**

One zone damper/controller/actuator assembly is required for each zone. You can incorporate up to 15 zones into the zoning control system. A zone damper/controller/actuator assembly consists of a round or rectangular zone damper and an LP-FXZAN13-0 zone damper/controller/actuator assembly. You can order these components factory installed or separately. These components consist of:

- LP-FXZAN13-0: integrated zone controller/actuator assembly
- ZOVSF-wwwxhhh: rectangular zone damper with factory installed LP-FXZAN13-0 Zone Controller/Actuator Assembly
- RZGddFDNO: round zone damper with factory installed LP-FXZAN13-0 Zone Controller/Actuator Assembly

Each zone controller is shipped from the factory pre-loaded with startup control application software that allows the installer to perform the following startup/commissioning operations:

- set the N2 address of the zone controller
- temporarily override the current position of the zone damper actuator
- view the current value of the zone temperature sensor
- view the current value of the zone sensor's warm/cool adjustment dial setting

Once the zone controllers are addressed, networked to the FX16, and powered, the FX16 downloads each zone controller with its corresponding portion of the zone control application software. Then, each zone controller performs the following functions:

- modulates the zone damper to maintain the desired zone temperature setpoint
- satisfies minimum ventilation requirements, depending on the rooftop unit's mode of operation
- provides, when polled, zone demand information to the FX16 Master Controller
- provides direct control over auxiliary heating, including staged heat, modulating heat, and parallel fan

## Zone Sensor



**Figure 5: Zone Sensor**

Each zone controller requires a zone sensor to:

- provide accurate zone temperature information
- allow the occupant to adjust the desired zone temperature setpoint
- allow the occupant to initiate temporary occupancy by pressing the push button

## Supply Duct Static Pressure Control Components

To reduce the buildup of supply duct static pressure caused by zone dampers' closing off, the FX16 provides a 0-10 V modulating output to control either a variable fan speed drive (provided by others) or a bypass damper/actuator assembly.

A bypass damper/actuator assembly redirects air from the supply air duct to the return air duct. It consists of a round or rectangular damper with a factory-installed non-spring return, proportional actuator. The dampers include:

- BOVSG-wwwxhhh: rectangular bypass damper with factory-installed actuator
- RCGddEDnco: round bypass damper with factory-installed actuator

## Medium User Interface (Optional)



**Figure 6: Medium User Interface (MUI)**

The FX16 Master Controller supports an optional, remotely mounted MUI that you use to:

- monitor the entire system status
- set control parameters for the entire system, including the rooftop unit, bypass, and all zone controllers
- schedule occupancy

## Application Software

The zoning system application software is targeted for the FX16 Master Controller and the FXZAN Zone Controllers. You can field install the application software into the FX16 using FX CommPro N2 or the FX Programming Key, or you can order the FX16 with the application software factory installed. Once the FXZANs are powered, networked to the FX16, and properly addressed, the FX16 downloads each FXZAN with its corresponding portion of the application.

The application software was constructed to allow for multiple configuration options. You can set these configuration options using the Medium User Interface, FX Builder Express, or FX CommPro N2.

**Table 7: Configuration Options**

Configuration Setting	Available Options
Unit Type	Standard rooftop or heat pump
Number of Zones	Up to 15
Number of Heating Stages	Up to four stages or modulating
Number of Cooling Stages	Up to four stages or modulating
Rooftop Control Type	Discharge air control or room control
Staged Control Type	First on/last off, equal runtime, or deadband control
Economizer Switchover Strategy	Dry bulb, dual dry bulb, single enthalpy, dual enthalpy, or self-configuring based on available sensors
Auxiliary Zone Heat Type	None, modulating, 1 stage, 2 stages, parallel fan and 1 stage, or parallel fan and modulating
Zone Damper/Box Type	45, 60, or 90° travel

## Accessories

A number of additional accessories are also available; some are required and some are optional. Accessories include the following:

- (required) discharge air temperature sensor
- (required) outside air temperature sensor
- (optional) outside air humidity sensor. Used for single or dual enthalpy economizer switchover.
- (optional) XT/XP Expansion Input/Output (I/O) modules. Used if return air temperature and/or return air humidity sensors are being used.
- (optional) return air temperature sensor. Used for dual dry bulb or dual enthalpy economizer switchover.
- (optional) return air humidity sensor. Used for dual enthalpy economizer switchover.
- (optional) mixed air temperature sensor. Used for mixed air low limit control.
- (optional) carbon dioxide sensor. Used for IAQ control.
- (optional) fan status current relay sensing switch
- (optional) filter status switch
- (optional) FX Tools Express. Used for software-based application configuration, downloading, and commissioning.
- (optional) FX Programming Key. Used for application downloading.

## Facility Explorer Commercial Zoning Control Package Ordering Information

**Table 8: FX16 Master Controller (One Required for Each Rooftop)**

Part Number	Description
LP-FX16X01-511C	FX16 Master Controller with extended temperature rating, N2 communication card, and factory-installed FX Commercial Zoning application software
LP-FX16X01-000C	FX16 Master Controller with extended temperature rating, N2 communication card (application-less)
LP-FX16D01-000C	FX16 Master Controller with normal temperature rating, N2 communication card (application-less)

**Table 9: Zone Damper/Controller/Actuator Assembly (One Damper Assembly Required for Each Zone)**

Part Number	Description
ZOVSF-wwwxhhh	Rectangular Zone Damper/Controller/Actuator Assembly, where www = width in inches and hhh = height in inches (008x008 to 030x030). Includes factory-installed LP-FXZAN13-0 Zone Controller/Actuator Assembly.
RZGddFDNO	Round Zone Damper/Controller/Actuator Assembly, where dd = diameter in inches (6 to 18, in 2-inch increments). Includes factory-installed LP-FXZAN13-0 Zone Controller/Actuator Assembly.
LP-FXZAN13-0	Zone Controller/Actuator Assembly. Only needed if retrofitting to existing zone damper or if field mounting to the zone damper is preferred.

**Table 10: Zone Sensor (One Zone Sensor Required for Each Zone)**

Part Number	Description
LP-KIT006-005C	Zone temperature sensor with push button for temporary occupancy and warm/cool adjustment dial. Includes wall mounting base and hardware.

**Table 11: Supply Duct Static Pressure Control Components (One Damper Assembly and One Sensor Required for Each Rooftop)**

Part Number	Description
BOVSG-wwwxhhho	Rectangular Bypass Damper/Actuator Assembly, where www = width in inches, hhh = height in inches, and o = options (none = no options, C = cover over actuator). Includes factory-installed M910XHGA non-spring return, proportional actuator.
RCGddEENC	Round Bypass Damper/Actuator Assembly, where dd = diameter in inches (6 to 18 in. 2-inch increments), NC = normally closed. Includes factory-installed M910XHGA non-spring return, proportional actuator.
DPT2640-005D	Supply duct static pressure sensor (0-5 in. Water Column [W.C.])

**Table 12: Medium User Interface (One Optional for Each FX16)**

Part Number	Description
LP-DIS60P10-0C	Local mount (<3 m [9.8 ft]) Medium User Interface. Includes panel mount hardware.
LP-KIT007-000C	Interface cable for connection of local mount MUI to FX16
LP-DIS60P11-0C	Remote mount (<300 m [984 ft]) Medium User Interface. Includes wall mount hardware.

**Table 13: Required Accessories**

Part Number	Description
TE-6313P-1	Outdoor air temperature sensor. Includes nickel element with 3-inch probe. One required for each rooftop.
TE-6311P-1	Duct probe temperature sensor. Includes nickel element with 8-inch probe. One required for supply air temperature.

**Table 14: Optional Accessories**

Part Number	Description
LP-XT91D00-000C LP-XP91D02-000C	Extension/Expansion Modules. Needed to expand FX16's I/O capability (if return air temperature and return air humidity are required).
TE-6311P-1	Duct probe temperature sensor. Includes nickel element with 8-inch probe. One each used for mixed air and return air temperature.
HE-67N3-XXXXX	Combination humidity and temperature (nickel element) sensor. Used for outside air and return air temperature and humidity.
CD-P00-00-0	Carbon dioxide sensor (duct mount)
P32AF-1C or -2C	Differential pressure switch. Used for filter status. P32AF-1C includes L bracket. P32AF-2C includes U bracket.
H708	Current sensing relay. Optionally used for fan status.
LP-FXTEXP-0	FX Tools Express. Includes FX-Builder Express and FX CommPro N2. Used for software configuration and commissioning.
LP-KIT100-000C	FX Programming Key. Used for downloading application to FX16.



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