

L ZONE

ZONE CONTROL AND VARIABLE AIR VOLUME SYSTEM FOR L SERIES PACKAGED UNITS

Bulletin # 210185

June 1999

Supersedes September 1997

FEATURES AND SYSTEM COMPONENTS

Applications - For L Series packaged rooftop units 3 to 30 ton (32 to 106 kW), factory or field installed, up to 15 zones per rooftop, up to 48 zones per Companion Panel.

Warranty -All covered components - three years, refer to Lennox Limited Warranty Certificate included with unit for specific details.

Companion Panel (60K07) -Password protected, electronic board within a rigid plastic enclosure. Board contains connections for network and communication devices. The Companion Panel monitors the network controllers (VAV, UNT) over the N2 Bus as they perform local and global controls, such as Weekly Scheduling, Trending and Control Logic. Equipped with 50VA-120/24v power supply with circuit breaker to power control board, two 120v outlets for modem transformer and laptop computer (not furnished), direct connect cable for access via laptop or local PC, modem with 120v/9v transformer and phone cable and network communication cable entry, removable door provides complete access, locking front latch. The RAM memory has a lithium battery back-up, capable of retaining database memory for up to six months after a power outage, shipping weight: 22 lbs.(10 kg).

A serial printer port is furnished for printing directly from the panel. The Companion Panel software is resident on the panel itself. A PC is used to send or generate the data base. If security is an issue, or, if panel is located where ambient temperature exceeds the PC limits, the PC may be relocated. A VT100 screen terminal is also available as another option, to interface with the Companion Panel. The VT100 terminal acts as a dedicated terminal station. The Companion Panel can be accessed through optional Color Graphics software.

The panel can operate within a wide range of temperature and humidity, suitable for an equipment room. The maximum operating temperature shall not exceed 122°F (50°C) and the operating humidity shall not exceed 90% RH (non-condensing). A dedicated 120V power source must be provided to the Companion Panel.

Allow adequate clearance for cable connections. The enclosure should be mounted at a reasonable height, not to exceed 6 ft. (1.8 m) from the top of the panel enclosure to the floor.

Solid State Control Board Features:

Points

Companion panel capacity is 800 points; each rooftop occupies 34 points; each bypass 5 points and each zone 10 points.

Global Data Share

Zone demand for each zone will be transmitted to the roof top, outdoor temperature and humidity is shared from one sensor to all rooftop units.

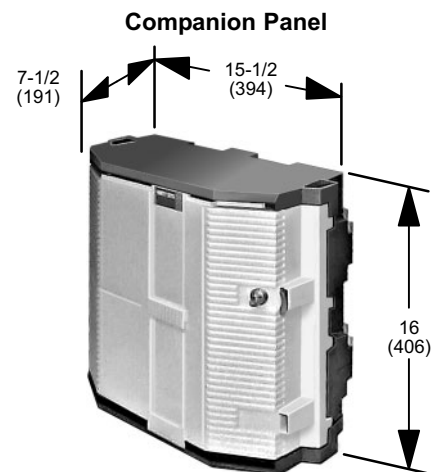
Weekly Scheduling - All zones and rooftops can be scheduled for energy savings, up to 130 schedules.

Trending - 32 different data trends can document accuracy for the zones and to show heating and cooling run times.

Control Logic - 30 different processes can control 12 points per process.

Password Protected - Four levels of protection.

Energy Management - Optimal Start/Stop, Load Rolling and Demand Limiting available.



NOTE - Allow 6 in. (152 mm) clearance on left side of panel

FEATURES AND SYSTEM COMPONENTS (CONTINUED)

UNT Rooftop Module - Electronic stand-alone digital control of all heating, cooling and economizer functions, pre-configured with specialized zoning software to control HVAC equipment, may be factory installed wired, mounted and tested with jackplug harness, may also be field installed, 6 analog inputs, 4 binary inputs, 6 binary outputs and 2 analog outputs, proportional control of economizer for minimum position, IAQ and free cooling, phone plug connection (6 pin cable provided) for Rooftop/Zone Commissioning Tool connection, kit includes discharge sensor, return air sensor and blower proving switch, transformer required - see System Selection Flowcharts.

The UNT Rooftop Module functions are:

- Provide control up to 2 stage heat, 2 stage cool
- Provide blower on/off control
- Measure discharge air temperature
- Measure return air temperature
- Provide wall thermostat connection (for single zone units only)
- Provide air flow proving capability
- Provide dirty air filter alarm (with optional dirty filter switch)
- Provide CO² sensing capability (with optional CO² sensor)
- Control proportional economizer output

UNT Rooftop Module is ideal for providing heating and cooling before the complete communication network has been installed. The Rooftop Module will provide default room temperature control 71°F (22°C) Heat, 73°F (23°C) Cool if communication from the Companion Panel is interrupted.

When connected to the Companion Panel, the Rooftop Module provides all point control information to the rest of the network. The devices communicate through an N2 Bus. Each module is identified by setting 6 dip switches. The switches located in the upper right corner of the module are set to the same number as is assigned to the module through software. The Companion Panel uses this address for polling and commanding.

Standards Compliance

UNT Controller complies with the following standards:

- FCC Part 15, Subpart B, Class A
- IEEE 472
- IEEE 587 Category A
- UL 916, UL 864

UNT Controller Hardware Characteristics (UNT121-1)

Operating temperature rating - -40 to 140°F (-18 to 60°C)

Analog outputs (0 to 10 VDC @ 10 mA) - 2

Binary outputs: 24VAC triacs @ 0.5 amps or 0.8 amps if total power is limited - 6 I/O terminations - Quick Connects (spade lugs)

Global Enthalpy Sensor (54K63) - Field installed kit plugs into one rooftop unit to provide enthalpy to all rooftops via global data share, nickel temperature sensor and polymer humidity sensor.

Outdoor humidity and temperature sensor transmit signals to a UNT Rooftop Module mounted in one of the rooftop units. This information is communicated to the Companion Panel, to be globally shared between all other UNT controllers. One sensor is required per Companion Panel.

The sensor measures relative humidity over the entire range of 0 to 100% RH.

Zone Sensor - Attractive styled wall mount sensor, available with either phone jack (60K12) or terminal block (42N44) wiring connection to damper, latching door mechanism, warmer/cooler setpoint adjustment in both °F and °C. The single slide lever proportional band default will allow for temperature variations of + or - 2°F (1°C) heat or cool in multi or single zone applications. The proportional zone temperature defaults can be modified on site. The sensor communicates directly through a zone bus to the UNT Rooftop Module (in single zone applications) or to the zone damper VAV damper controller (in multi-zone applications). The temperature information received from the zone sensor determines single zone heating/cooling operation or multi-zone heating/cooling operation with zone damper operation. Push-button override on the zone sensor allows user to temporarily override space temperature for an adjustable time duration. (default 180 minutes), service jack for Rooftop/Zone Commissioning Tool, wall-plate (43N45) required for handy box mounting.

Rooftop/Zone Commissioning Tool (60K36) - The Commissioning Tool (ZT), is a hand held device interface for VAV or UNT controllers. It connects to a controller directly or via the phone jack on the zone sensor and allows the user to monitor or adjust setpoints for a specific zone. Programmable for use with either rooftop module or zone sensor, color coded template on tool for dual usage, complete with carrying case and necessary cables, and User's Manual.

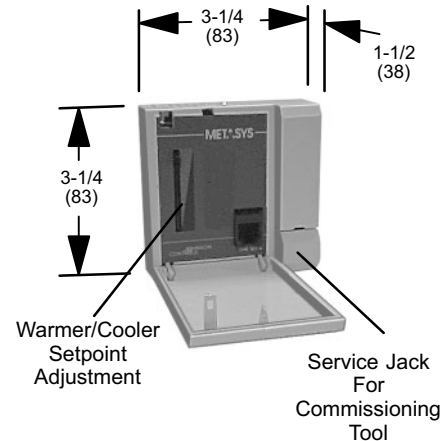
Features:

- Quickly identify an alarm and its location
- Monitor and adjust up to 18 analog points
- Monitor 18 binary points

UNT Rooftop Module



Zone Sensor



Rooftop/Zone Commissioning Tool



FEATURES AND SYSTEM COMPONENTS (CONTINUED)

Zone Dampers - Available in round and rectangular configurations, constructed of heavy gauge galvanized steel, furnished with one straight end and one crimped end (crimped end on round damper, standing cleat on rectangular damper), complete with VAV damper controller, supply air sensor, incremental actuator and enclosure, slave zone dampers are also available in same sizes as zone dampers without controller and supply air sensor. The actuator is a synchronous 3 wire motor, controlled by the VAV damper controller. The function of the supply air sensor is to determine the air temperature being distributed to the supply air damper. The information received by the controller via the supply air sensor will determine the damper position, along with the zone sensor demand and other considerations. The zone sensor will ultimately modulate the supply air damper to provide adequate conditioned air to heat or cool the area. Each zone will accommodate optional auxiliary heat which can be controlled by the 1st or 2nd stage. Minimum damper position can be set at the VAV damper controller, Companion Panel or Zone Sensor level. All information at the VAV level can be shared by the Companion Panel.

The supply air dampers must be sized to maintain air velocities between 600 to 1000 fpm (3 to 5 m/s). Insulating the supply air duct between the unit and the diffuser or at least 10 ft. (3.0 m) upstream of the diffuser is recommended. Dampers within 5 ft (1.5 m) of a supply air outlet shall not exceed 700 fpm (3.5 m/s) air velocity and must be acoustically insulated to maintain acceptable noise levels. Clear inside duct dimensions must be maintained.

Refer to Zone Damper Checklist Tables for damper sizes available and dimensions.

Bypass Damper - Available in round or rectangular configurations, complete with damper assembly, VAV damper controller, proportional actuator and static pressure transducer kit, slave bypass dampers are also available in same sizes as bypass dampers.

The 24VAC electric motor actuator is driven by a proportional control signal (0-10VDC). The rotation is mechanically limited to 93° by integral end stops. The position of the actuator is visually indicated from 0-90°.

Bypass Damper is used to provide constant air delivery through an HVAC unit in a multi-zone system. As building load is satisfied, the zone dampers in the system start to modulate closed. This reduces building air requirements. A Static Pressure Transducer (furnished with bypass damper) drives the Bypass Damper partially open to allow the excess air to flow from the supply side to the return side of the HVAC unit. This eliminates excessive system static pressure. Constant air quantities can be maintained through the HVAC unit. This also prevents the generation of noise at the diffusers and erratic loss of temperature control in the zones.

VAV damper controller directs the damper actuator and is side mounted on the damper, see dimension drawings. The VAV damper controller receives an analog input from the static pressure transducer located in the supply air ductwork. Analog input is translated to a damper position reflecting the duct system pressures. The system external static pressure must not exceed 1.5 in. w.g. (373 Pa). Bypass dampers can easily be slaved when a single bypass damper will not meet damper size requirements. The total net face area must be maintained when slaving and both dampers must be of the same physical dimensions.

Refer to Bypass Damper Checklist Tables for damper sizes available and dimensions.

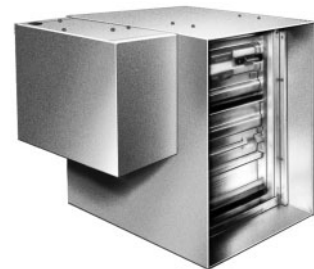
Differential Pressure Transducer (Furnished With Bypass Damper) - Pressure Transducer measures the supply air pressure relative to the atmospheric pressure and modulates the Bypass Damper to maintain constant supply air static pressure throughout the system. The pressure is converted to a proportional (0-5vdc) analog output. The output is received by the VAV damper controller which controls the actuator and will also enable the Companion Panel to view the information. System pressures can be site adjusted via the VAV damper controller to optimize system efficiencies.

The pressure transducer shall be located on the side of the supply air duct, at 2/3 of the total distance of the longest duct. Duct static pressure, at this location, shall not exceed 1.5 in. w.g. (373 Pa).

Rectangular
Zone Slave Damper
(With Actuator)



Rectangular
Zone/Bypass Damper
(With Controls)



Round
Zone/Bypass Damper
(With Controls)



FEATURES AND SYSTEM COMPONENTS (CONTINUED)

VAV Damper Controller (Included With Zone and Bypass Dampers)

The VAV Damper Controller is an electronic device for electronic control of zone dampers and bypass dampers.

When connected to the Companion Panel, the controller provides all points and control information to the rest of the network. The device communicates through an N2 Bus.

Each VAV damper controller has a default program to enable it to perform its control function if communication is interrupted.

Zone and bypass dampers are shipped with the VAV Damper Controller factory installed.

VAV functions (zone damper) are:

- Provide connection to Zone Sensor.
- Measure inlet air temperature to the zone damper.
- Control two stage of baseboard/duct heat, incremental hot water valve or proportional heat water valve.
- Provide control of incremental zone actuator (drive open/drive closed).
- Provide control of proportional bypass actuator (opens with static pressure increase).
- Control bypass damper via system duct pressure.
- Provides feedback of bypass damper actuator.

The installation location of the zone dampers and bypass dampers containing the VAV Damper Controller must meet the following environmental standards:

- The atmosphere must be free of explosive vapors or escaping gases.
- The atmosphere must be free of exposure to corrosive chemical or salt vapors, which might damage electrical equipment.
- The temperature must be maintained between 32°F to 122°F (0°C to 50°C) with the relative humidity (non-condensing) maintained between 10 and 90%.
- The power line must be "clean" without electrical noise transients that are often present in industrial environments. Commercial and residential buildings typically have "clean" power, but may not, depending on location, nearby equipment, etc. Keep communication wiring runs as far as possible from electrical noise generators.

VAV Controller Model Features (VAV141)

Ambient temperature rating -32 to 140°F (0 to 60°C)

Analog inputs - 6

RTD temperature elements (1000 ohm nickel).

2K ohm setpoint potentiometers.

0 to 10VDC transmitters.

Binary inputs - 4

(4) dry contacts.

(1) momentary push button from zone sensor for temporary occupancy mode.

BI 4 may be used as an accumulator input for frequencies less than 100hz.

Analog outputs - 2

0 to 10 VDC @ 10 mA.

Binary outputs - 6

24VAC triacs @ 0.5 amps or 0.8 amps if total power is limited.

N2 Bus - Isolated

Zone Bus - Discrete connections at controller.

8-pin and 6-pin phone jack on controller.

6-pin phone jack at zone sensor.

LED indication.

24VAC power in terminations - Removeable screw terminal block.

I/O terminations - Fixed screw terminal block.

N2 terminations - Removeable screw terminal block.

Damper Transformer - Required for zone and bypass damper operation:

120v/24v-75VA, foot mount, Y66T12-0 (71N76).

See System Selection Flowchart for usage.

Damper
Transformer



OPTIONAL EQUIPMENT (ORDERED EXTRA - SEE SYSTEM SELECTION FLOWCHARTS)

VT100 Video Terminal (Field Furnished) - Provides an inexpensive person-machine interface, consists of a monochrome monitor and keyboard with special connection to the Companion microprocessor, unlike a PC, hard drive, disk drive, mouse or RAM is not required.

Color Graphics Workstation Software (35N50) - Provides graphical access to the database and all the associated points, user develops files via Microsoft® Paintbrush, requires a dedicated PC with color monitor and mouse.

Serial Printer (Field Supplied) - Printer with serial interface board is recommended to connect directly to the Companion Panel, printer can be used to print out alarms, databases and security access to the panel, if a VT100 or a onsite PC are used, standard printers can be used.

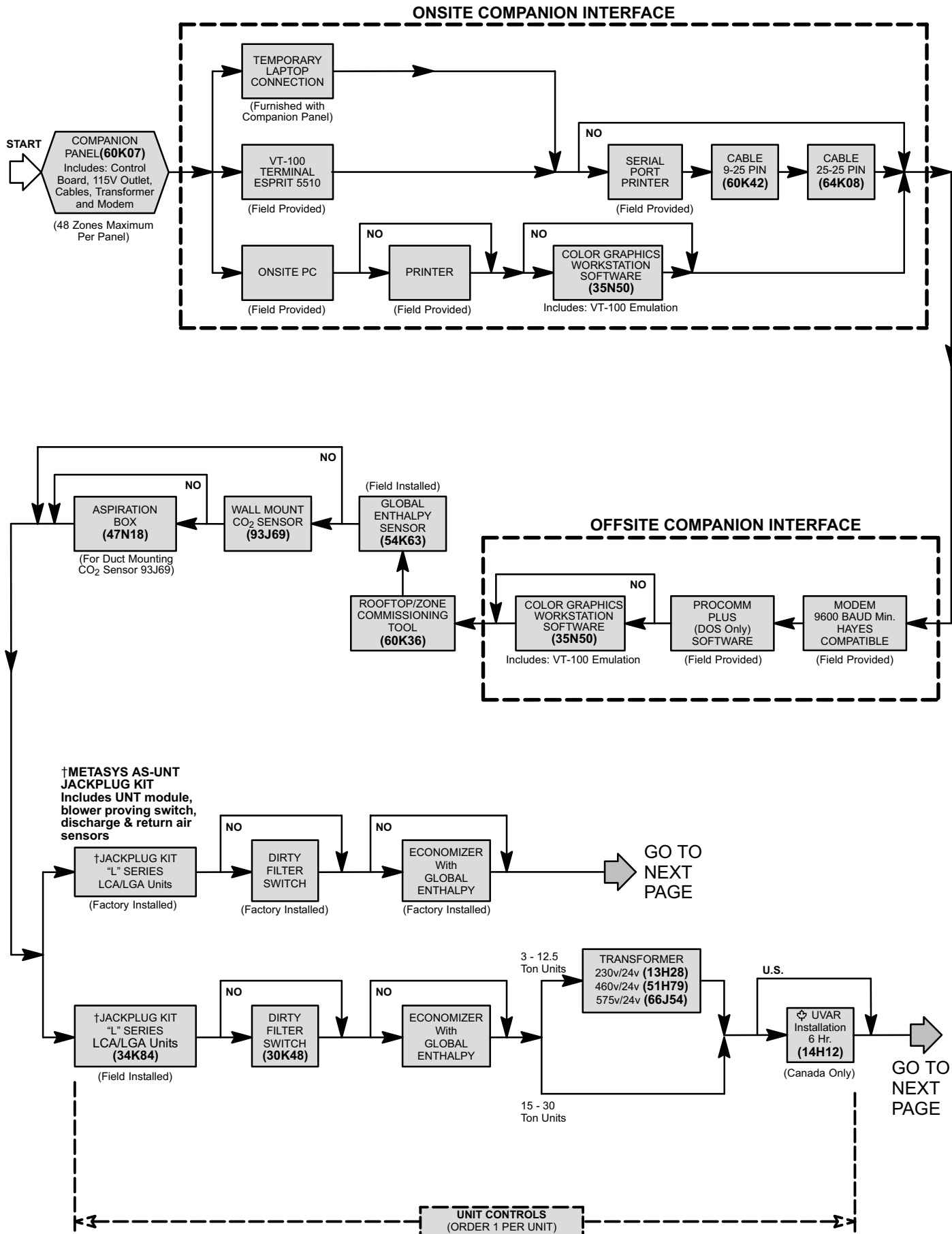
CO₂ Sensor (93J69) - L Zone system can utilize a 0-2000 PPM sensor to modulate the economizer open in poor IAQ conditions, Companion panel can also trend the information for future retrieval, CO₂ sensor can be wall mounted or can installed within an aspiration box (**47N18**) onto a return duct system upstream of a bypass damper.

Analog Economizer - Standard on L series economizers, analog economizers operate in the 0-10VDC range, L Zone module directly controls the damper operation for minimum position, modulating "free cooling" or CO₂ override, damper position is controlled by the discharge temperature and the outdoor temperature/humidity sensors.

SYSTEM SELECTION FLOWCHART

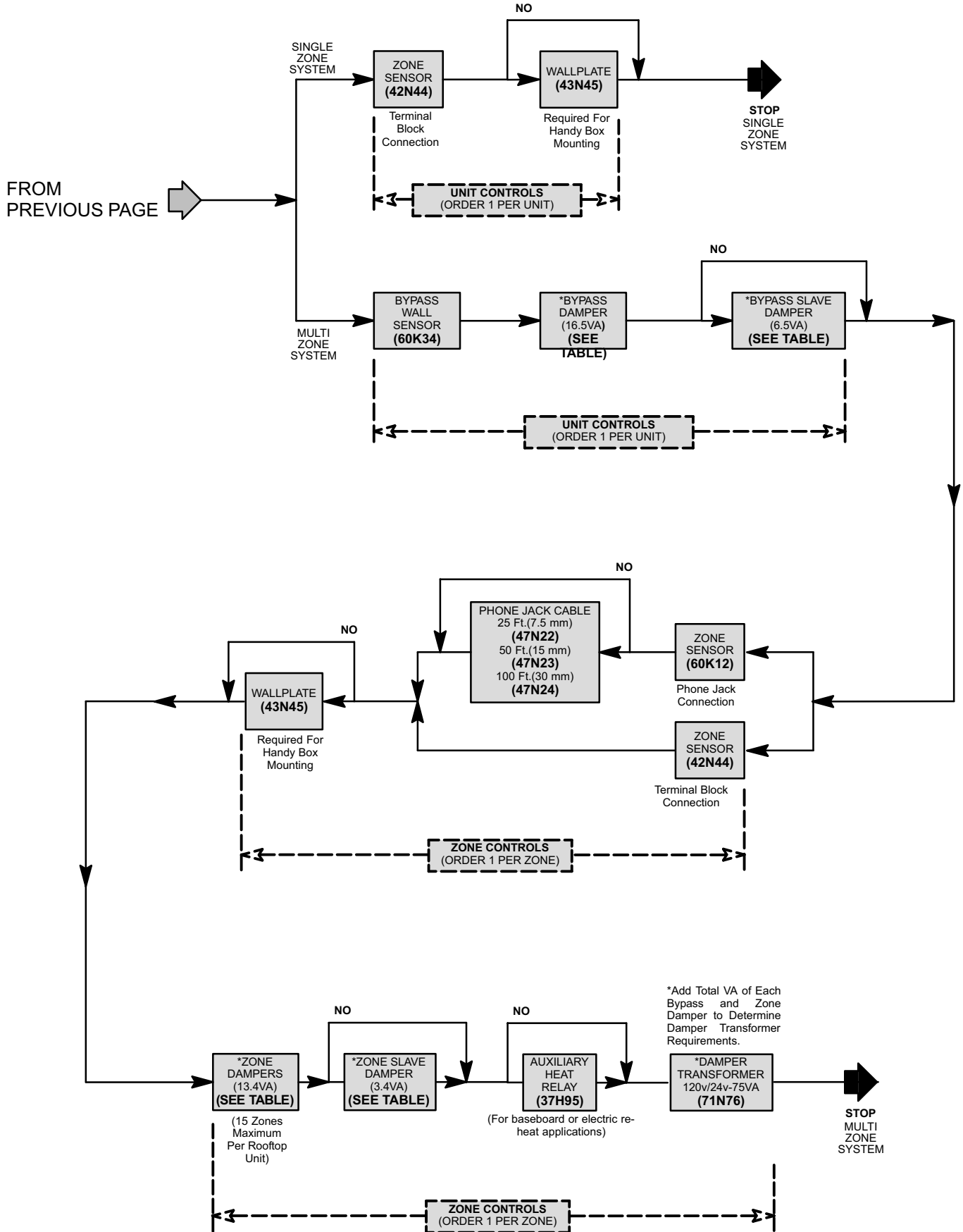
For **PACKAGED GAS** or **PACKAGED COOLING** (Not for Heat Pump Systems)

See Price Pages For Complete Listing Of System Components



SYSTEM SELECTION FLOWCHART

For **PACKAGED GAS** or **PACKAGED COOLING** (Not for Heat Pump Systems)
 See Price Pages For Complete Listing Of System Components

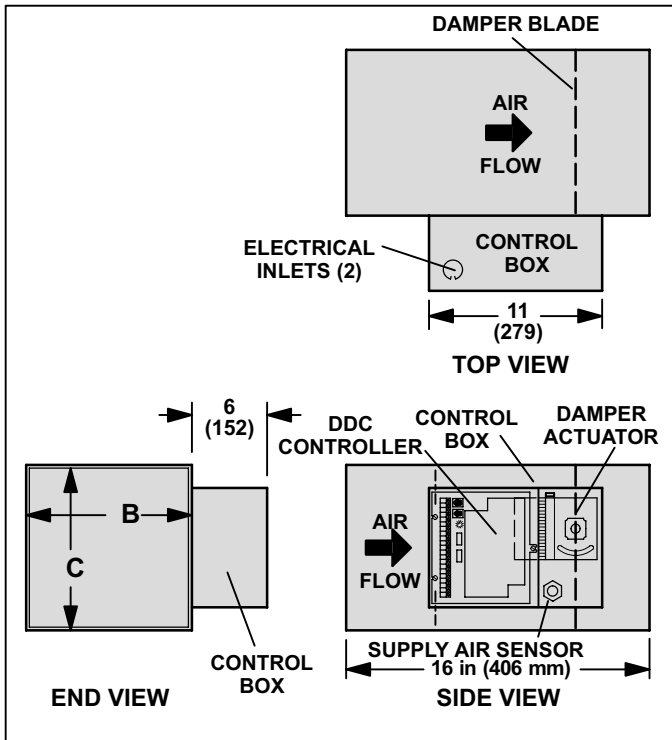


DAMPER DIMENSION DRAWINGS - INCHES (MM)

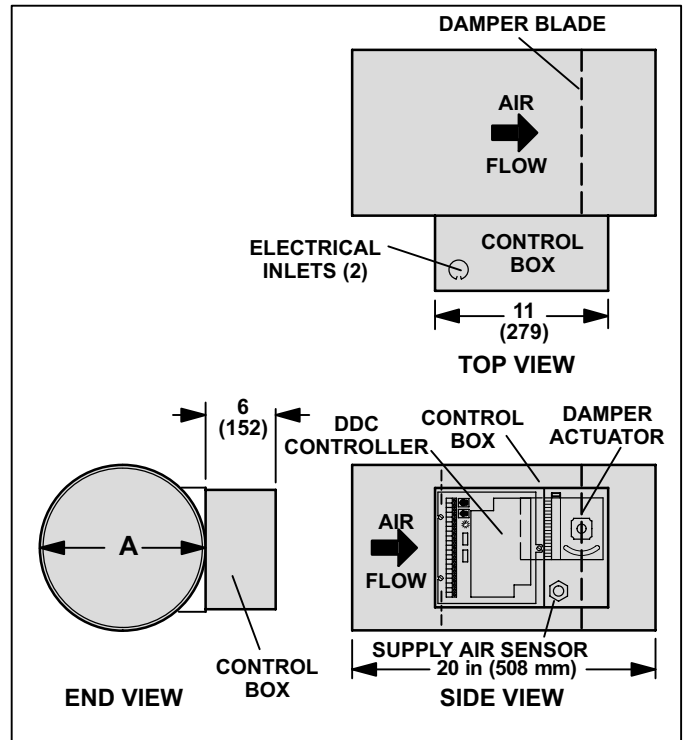
SEE DAMPER CHECKLIST TABLES FOR ACTUAL DIMENSIONS TO LETTERS SHOWN ON DRAWINGS

BYPASS AND ZONE DAMPERS

RECTANGULAR DAMPERS - BYPASS
RECTANGULAR DAMPERS - ZONE

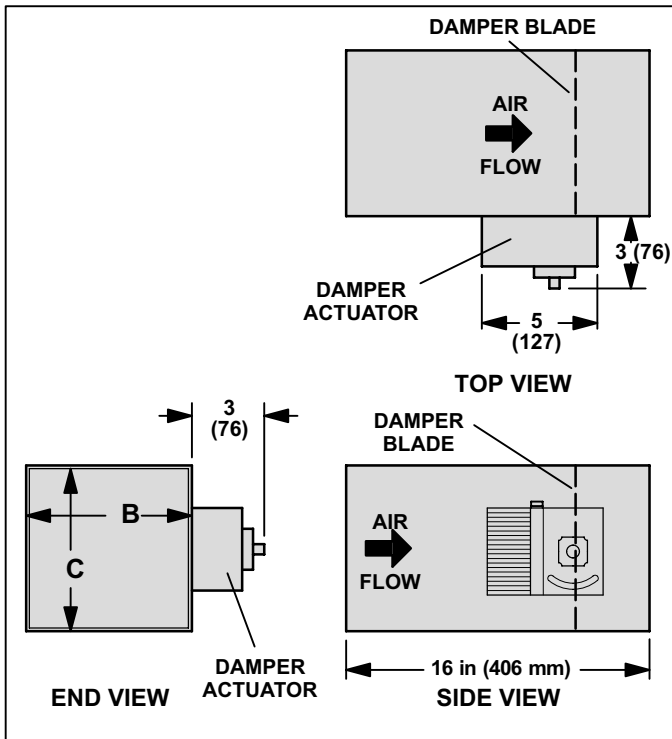


ROUND DAMPERS - BYPASS
ROUND DAMPERS - ZONE

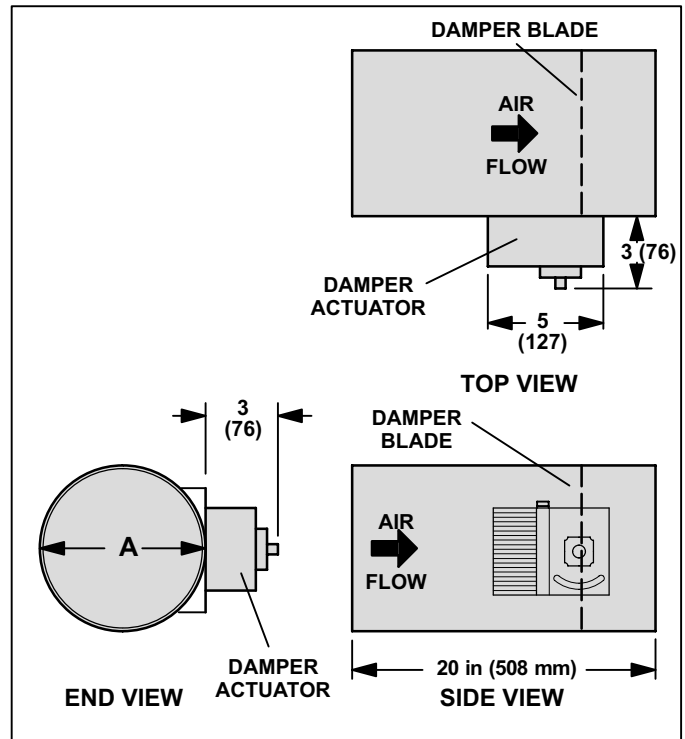


BYPASS SLAVE AND ZONE SLAVE DAMPERS

RECTANGULAR DAMPERS - BYPASS SLAVE
RECTANGULAR DAMPERS - ZONE SLAVE



ROUND DAMPERS - BYPASS SLAVE
ROUND DAMPERS - ZONE SLAVE



BYPASS DAMPER CHECKLIST - ALSO SEE DIMENSION DRAWINGS

ROUND DAMPERS - BYPASS - 20 in. (508 mm) Length Includes Damper, VAV Damper Controller, Actuator and Static Pressure Transducer Kit

Model No.	Diameter (A)		Catalog No.	Ship. Wt.		Qty.
	in.	mm		lbs.	kg	
<input type="checkbox"/> JC RD-2018-706 BD	6	152	60K13	11	5	
<input type="checkbox"/> JC RD-2018-708 BD	8	203	60K14	13	6	
<input type="checkbox"/> JC RD-2018-710 BD	10	254	60K15	17	8	
<input type="checkbox"/> JC RD-2018-712 BD	12	305	60K16	22	10	
<input type="checkbox"/> JC RD-2018-714 BD	14	356	60K17	27	12	
<input type="checkbox"/> JC RD-2018-716 BD	16	407	60K18	33	15	

ROUND DAMPERS - BYPASS SLAVE - 20 in. (508 mm) Length Includes Damper and Proportional Actuator

Model No.	Diameter (A)		Catalog No.	Ship. Wt.		Qty.
	in.	mm		lbs.	kg	
<input type="checkbox"/> JC RD-2018-906 BS	6	152	60K19	6	3	
<input type="checkbox"/> JC RD-2018-908 BS	8	203	60K20	8	4	
<input type="checkbox"/> JC RD-2018-910 BS	10	254	60K21	12	5	
<input type="checkbox"/> JC RD-2018-912 BS	12	305	60K22	17	8	
<input type="checkbox"/> JC RD-2018-914 BS	14	356	60K23	22	10	
<input type="checkbox"/> JC RD-2018-916 BS	16	407	60K24	28	13	

RECTANGULAR DAMPERS - BYPASS - 16 in. (406 mm) Length Includes Damper, VAV Damper Controller, Proportional Actuator and Static Pressure Transducer Kit

Model No.	Dimensions (B x C)		Catalog No.	Ship. Wt.		Qty.
	in.	mm		lbs.	kg	
<input type="checkbox"/> JC LEN131 10X6 -7BD	10 x 6	254x152	61K20	13	6	
<input type="checkbox"/> JC LEN131 12X6 -7BD	12 x 6	305x152	61K21	14	6	
<input type="checkbox"/> JC LEN131 08X08 -7BD	8 x 8	203x203	61K22	13	6	
<input type="checkbox"/> JC LEN131 10X08 -7BD	10 x 8	254x203	61K23	15	6	
<input type="checkbox"/> JC LEN131 12X08 -7BD	12 x 8	305x203	61K24	16	7	
<input type="checkbox"/> JC LEN131 14X08 -7BD	14 x 8	356x203	61K25	18	8	
<input type="checkbox"/> JC LEN131 10X10 -7BD	10 x 10	254x254	61K26	17	8	
<input type="checkbox"/> JC LEN131 12X10 -7BD	12 x 10	305x254	61K27	19	9	
<input type="checkbox"/> JC LEN131 14X10 -7BD	14 x 10	356x254	61K28	20	9	
<input type="checkbox"/> JC LEN131 16X10 -7BD	16 x 10	406x254	61K29	22	10	
<input type="checkbox"/> JC LEN131 18X10 -7BD	18 x 10	457x254	61K30	23	10	
<input type="checkbox"/> JC LEN131 20X10 -7BD	20 x 10	508x254	61K31	25	11	
<input type="checkbox"/> JC LEN131 12X12 -7BD	12 x 12	305x305	61K32	20	9	
<input type="checkbox"/> JC LEN131 14X12 -7BD	14 x 12	356x305	61K33	22	10	
<input type="checkbox"/> JC LEN131 16X12 -7BD	16 x 12	406x305	61K34	24	11	
<input type="checkbox"/> JC LEN131 18X12 -7BD	18 x 12	457x305	61K35	25	11	
<input type="checkbox"/> JC LEN131 20X12 -7BD	20 x 12	508x305	61K36	27	12	
<input type="checkbox"/> JC LEN131 24X12 -7BD	24 x 12	610x305	61K37	28	13	
<input type="checkbox"/> JC LEN131 26X12 -7BD	26 x 12	660x305	61K38	28	13	
<input type="checkbox"/> JC LEN131 28X12 -7BD	28 x 12	722x305	61K39	31	14	
<input type="checkbox"/> JC LEN131 30X12 -7BD	30 x 12	762x305	61K40	32	15	
<input type="checkbox"/> JC LEN131 14X14 -7BD	14 x 14	356x356	61K41	24	11	
<input type="checkbox"/> JC LEN131 16X14 -7BD	16 x 14	406x356	61K42	26	12	
<input type="checkbox"/> JC LEN131 18X14 -7BD	18 x 14	457x356	61K43	28	13	
<input type="checkbox"/> JC LEN131 20X14 -7BD	20 x 14	508x356	61K44	29	13	
<input type="checkbox"/> JC LEN131 24X14 -7BD	24 x 14	610x356	61K45	31	14	
<input type="checkbox"/> JC LEN131 28X14 -7BD	28 x 14	722x356	61K46	33	15	

Model No.	Dimensions (B x C)		Catalog No.	Ship. Wt.		Qty.
	in.	mm		lbs.	kg	
<input type="checkbox"/> JC LEN131 16X16 -7BD	16 x 16	406x406	61K47	28	13	
<input type="checkbox"/> JC LEN131 18X16 -7BD	18 x 16	457x406	61K48	30	14	
<input type="checkbox"/> JC LEN131 20X16 -7BD	20 x 16	508x406	61K49	32	15	
<input type="checkbox"/> JC LEN131 22X16 -7BD	22 x 16	559x406	61K50	34	15	
<input type="checkbox"/> JC LEN131 24X16 -7BD	24 x 16	610x406	61K51	35	16	
<input type="checkbox"/> JC LEN131 18X18 -7BD	18 x 18	457x457	61K52	32	15	
<input type="checkbox"/> JC LEN131 20X18 -7BD	20 x 18	508x457	61K53	34	15	
<input type="checkbox"/> JC LEN131 22X18 -7BD	22 x 18	559x457	61K54	36	16	
<input type="checkbox"/> JC LEN131 24X18 -7BD	24 x 18	610x457	61K55	37	17	
<input type="checkbox"/> JC LEN131 30X18 -7BD	30 x 18	762x457	61K56	42	19	
<input type="checkbox"/> JC LEN131 20X20 -7BD	20 x 20	508x508	61K57	36	16	
<input type="checkbox"/> JC LEN131 22X20 -7BD	22 x 20	559x508	61K58	38	17	
<input type="checkbox"/> JC LEN131 24X20 -7BD	24 x 20	610x508	61K59	40	18	
<input type="checkbox"/> JC LEN131 26X20 -7BD	26 x 20	660x508	61K60	42	19	
<input type="checkbox"/> JC LEN131 30X20 -7BD	30 x 20	762x508	61K61	46	21	
<input type="checkbox"/> JC LEN131 36X20 -7BD	36 x 20	914x508	61K62	51	23	
<input type="checkbox"/> JC LEN131 22X22 -7BD	22 x 22	559x559	61K63	42	19	
<input type="checkbox"/> JC LEN131 24X22 -7BD	24 x 22	610x559	61K64	44	20	
<input type="checkbox"/> JC LEN131 26X22 -7BD	26 x 22	660x559	61K65	46	21	
<input type="checkbox"/> JC LEN131 28X22 -7BD	28 x 22	722x559	61K66	49	22	
<input type="checkbox"/> JC LEN131 36X22 -7BD	36 x 22	914x559	61K67	58	26	
<input type="checkbox"/> JC LEN131 24X24 -7BD	24 x 24	610x610	61K68	46	21	
<input type="checkbox"/> JC LEN131 26X24 -7BD	26 x 24	660x610	61K69	49	22	
<input type="checkbox"/> JC LEN131 28X24 -7BD	28 x 24	722x610	61K70	52	24	
<input type="checkbox"/> JC LEN131 30X24 -7BD	30 x 24	762x610	61K71	55	25	

Bypass Dampers Continued on Next Page ►

BYPASS DAMPER CHECKLIST - ALSO SEE DIMENSION DRAWINGS

RECTANGULAR DAMPERS - BYPASS SLAVE - 16 in. (406 mm) Length Includes Damper and Proportional Actuator

Model No.	Dimensions (B x C)		Catalog No.	Ship. Wt.		Qty.
	in.	mm		lbs.	kg	
<input type="checkbox"/> JC LEN131 10X06 -9BS	10 x 6	254x152	61K72	8	4	
<input type="checkbox"/> JC LEN131 12X06 -9BS	12 x 6	305x152	61K73	9	4	
<input type="checkbox"/> JC LEN131 08X08 -9BS	8 x 8	203x203	61K74	8	4	
<input type="checkbox"/> JC LEN131 10X08 -9BS	10 x 8	254x203	61K75	9	4	
<input type="checkbox"/> JC LEN131 12X08 -9BS	12 x 8	305x203	61K76	11	5	
<input type="checkbox"/> JC LEN131 14X08 -9BS	14 x 8	356x203	61K77	12	5	
<input type="checkbox"/> JC LEN131 10X10 -9BS	10 x 10	254x254	61K78	12	5	
<input type="checkbox"/> JC LEN131 12X10 -9BS	12 x 10	305x254	61K79	14	6	
<input type="checkbox"/> JC LEN131 14X10 -9BS	14 x 10	356x254	61K80	15	7	
<input type="checkbox"/> JC LEN131 16X10 -9BS	16 x 10	406x254	61K81	17	8	
<input type="checkbox"/> JC LEN131 18X10 -9BS	18 x 10	457x254	61K82	18	8	
<input type="checkbox"/> JC LEN131 20X10 -9BS	20 x 10	508x254	61K83	20	9	
<input type="checkbox"/> JC LEN131 12X12 -9BS	12 x 12	305x305	61K84	15	7	
<input type="checkbox"/> JC LEN131 14X12 -9BS	14 x 12	356x305	61K85	17	8	
<input type="checkbox"/> JC LEN131 16X12 -9BS	16 x 12	406x305	61K86	19	9	
<input type="checkbox"/> JC LEN131 18X12 -9BS	18 x 12	457x305	61K87	20	9	
<input type="checkbox"/> JC LEN131 20X12 -9BS	20 x 12	508x305	61K88	22	10	
<input type="checkbox"/> JC LEN131 24X12 -9BS	24 x 12	610x305	61K89	23	10	
<input type="checkbox"/> JC LEN131 26X12 -9BS	26 x 12	660x305	61K90	23	10	
<input type="checkbox"/> JC LEN131 28X12 -9BS	28 x 12	722x305	61K91	26	12	
<input type="checkbox"/> JC LEN131 30X12 -9BS	30 x 12	762x305	61K92	27	12	
<input type="checkbox"/> JC LEN131 14X14 -9BS	14 x 14	356x356	61K93	19	9	
<input type="checkbox"/> JC LEN131 16X14 -9BS	16 x 14	406x356	61K94	20	9	
<input type="checkbox"/> JC LEN131 18X14 -9BS	18 x 14	457x356	61K95	23	10	
<input type="checkbox"/> JC LEN131 20X14 -9BS	20 x 14	508x356	61K96	24	11	
<input type="checkbox"/> JC LEN131 24X14 -9BS	24 x 14	610x356	61K97	26	12	
<input type="checkbox"/> JC LEN131 28X14 -9BS	28 x 14	722x356	61K98	28	13	

Model No.	Dimensions (B x C)		Catalog No.	Ship. Wt.		Qty.
	in.	mm		lbs.	kg	
<input type="checkbox"/> JC LEN131 16X16 -9BS	16 x 16	406x406	61K99	22	10	
<input type="checkbox"/> JC LEN131 18X16 -9BS	18 x 16	457x406	62K00	25	11	
<input type="checkbox"/> JC LEN131 20X16 -9BS	20 x 16	508x406	62K01	27	12	
<input type="checkbox"/> JC LEN131 22X16 -9BS	22 x 16	559x406	62K02	29	13	
<input type="checkbox"/> JC LEN131 24X16 -9BS	24 x 16	610x406	62K03	30	14	
<input type="checkbox"/> JC LEN131 18X18 -9BS	18 x 18	457x457	62K04	27	12	
<input type="checkbox"/> JC LEN131 20X18 -9BS	20 x 18	508x457	62K05	29	13	
<input type="checkbox"/> JC LEN131 22X18 -9BS	22 x 18	559x457	62K06	31	14	
<input type="checkbox"/> JC LEN131 24X18 -9BS	24 x 18	610x457	62K07	32	15	
<input type="checkbox"/> JC LEN131 30X18 -9BS	30 x 18	762x457	62K08	37	17	
<input type="checkbox"/> JC LEN131 20X20 -9BS	20 x 20	508x508	62K09	30	14	
<input type="checkbox"/> JC LEN131 22X20 -9BS	22 x 20	559x508	62K10	32	15	
<input type="checkbox"/> JC LEN131 24X20 -9BS	24 x 20	610x508	62K11	35	16	
<input type="checkbox"/> JC LEN131 26X20 -9BS	26 x 20	660x508	62K12	37	17	
<input type="checkbox"/> JC LEN131 30X20 -9BS	30 x 20	762x508	62K13	41	19	
<input type="checkbox"/> JC LEN131 36X20 -9BS	36 x 20	714x508	62K14	46	21	
<input type="checkbox"/> JC LEN131 22X22 -9BS	22 x 22	559x559	62K15	37	17	
<input type="checkbox"/> JC LEN131 24X22 -9BS	24 x 22	610x559	62K16	39	18	
<input type="checkbox"/> JC LEN131 26X22 -9BS	26 x 22	660x559	62K17	41	19	
<input type="checkbox"/> JC LEN131 28X22 -9BS	28 x 22	711x559	62K18	43	20	
<input type="checkbox"/> JC LEN131 36X22 -9BS	36 x 22	914x559	62K19	53	24	
<input type="checkbox"/> JC LEN131 24X24 -9BS	24 x 24	610x610	62K20	41	19	
<input type="checkbox"/> JC LEN131 26X24 -9BS	26 x 24	660x610	62K21	44	20	
<input type="checkbox"/> JC LEN131 28X24 -9BS	28 x 24	711x610	62K22	47	21	
<input type="checkbox"/> JC LEN131 30X24 -9BS	30 x 24	762x610	62K23	50	23	

ZONE DAMPER CHECKLIST - ALSO SEE DIMENSION DRAWINGS

ROUND DAMPERS - ZONE - 20 inch (508 mm) Length
Includes Damper, Incremental Actuator,
VAV Damper Controller, Supply Air Sensor

Model No.	Diameter (A)		Catalog No.	Ship. Wt.		Qty.
	in.	mm		lbs.	kg	
<input type="checkbox"/> JC RD-2018-506 ZD	6	152	42N47	10	4	
<input type="checkbox"/> JC RD-2018-508 ZD	8	203	42N48	12	5	
<input type="checkbox"/> JC RD-2018-510 ZD	10	254	42N49	16	7	
<input type="checkbox"/> JC RD-2018-512 ZD	12	305	42N50	21	10	
<input type="checkbox"/> JC RD-2018-514 ZD	14	356	42N51	26	12	
<input type="checkbox"/> JC RD-2018-516 ZD	16	407	43N25	32	15	

ROUND DAMPERS - ZONE SLAVE - 20 inch (508 mm) Length
Includes Damper and Incremental Actuator

Model No.	Diameter (A)		Catalog No.	Ship. Wt.		Qty.
	in.	mm		lbs.	kg	
<input type="checkbox"/> JC RD-2018-206 ZS	6	152	60K01	6	3	
<input type="checkbox"/> JC RD-2018-208 ZS	8	203	60K02	8	4	
<input type="checkbox"/> JC RD-2018-210 ZS	10	254	60K03	12	5	
<input type="checkbox"/> JC RD-2018-212 ZS	12	305	60K04	17	8	
<input type="checkbox"/> JC RD-2018-214 ZS	14	356	60K05	22	10	
<input type="checkbox"/> JC RD-2018-216 ZS	16	407	60K06	28	13	

RECTANGULAR DAMPERS - ZONE - 16 in. (406 mm) Length
Includes Damper, Incremental Actuator, VAV Damper Controller, Supply Air Sensor

Model No.	Dimensions (B x C)		Catalog No.	Ship. Wt.		Qty.
	in.	mm		lbs.	kg	
<input type="checkbox"/> JC LEN131 10X06 -5ZD	10 x 6	254x152	60K72	12	5	
<input type="checkbox"/> JC LEN131 12X06 -5ZD	12 x 6	305x152	60K73	13	6	
<input type="checkbox"/> JC LEN131 08X08 -5ZD	8 x 8	203x203	60K74	12	5	
<input type="checkbox"/> JC LEN131 10X08 -5ZD	10 x 8	254x203	60K75	13	6	
<input type="checkbox"/> JC LEN131 12X08 -5ZD	12 x 8	305x203	60K76	15	7	
<input type="checkbox"/> JC LEN131 14X08 -5ZD	14 x 8	356x203	60K77	16	7	
<input type="checkbox"/> JC LEN131 10X10 -5ZD	10 x 10	254x254	60K78	16	7	
<input type="checkbox"/> JC LEN131 12X10 -5ZD	12 x 10	305x254	60K79	18	8	
<input type="checkbox"/> JC LEN131 14X10 -5ZD	14 x 10	356x254	60K80	19	9	
<input type="checkbox"/> JC LEN131 16X10 -5ZD	16 x 10	407x254	60K81	21	10	
<input type="checkbox"/> JC LEN131 18X10 -5ZD	18 x 10	457x254	60K82	22	10	
<input type="checkbox"/> JC LEN131 20X10 -5ZD	20 x 10	508x254	60K83	24	11	
<input type="checkbox"/> JC LEN131 12X12 -5ZD	12 x 12	305x305	60K84	19	9	
<input type="checkbox"/> JC LEN131 14X12 -5ZD	14 x 12	356x305	60K85	21	10	
<input type="checkbox"/> JC LEN131 16X12 -5ZD	16 x 12	407x305	60K86	23	10	
<input type="checkbox"/> JC LEN131 18X12 -5ZD	18 x 12	457x305	60K87	24	11	
<input type="checkbox"/> JC LEN131 20X12 -5ZD	20 x 12	508x305	60K88	26	12	
<input type="checkbox"/> JC LEN131 22X12 -5ZD	22 x 12	559x305	60K89	27	12	
<input type="checkbox"/> JC LEN131 24X12 -5ZD	24 x 12	610x305	60K90	27	12	
<input type="checkbox"/> JC LEN131 28X12 -5ZD	28 x 12	711x305	60K91	30	14	
<input type="checkbox"/> JC LEN131 30X12 -5ZD	30 x 12	762x305	60K92	31	14	
<input type="checkbox"/> JC LEN131 14X14 -5ZD	14 x 14	356x356	60K93	23	10	
<input type="checkbox"/> JC LEN131 16X14 -5ZD	16 x 14	407x356	60K94	24	11	
<input type="checkbox"/> JC LEN131 18X14 -5ZD	18 x 14	457x356	60K95	27	12	
<input type="checkbox"/> JC LEN131 20X14 -5ZD	20 x 14	508x356	60K96	28	13	
<input type="checkbox"/> JC LEN131 24X14 -5ZD	24 x 14	610x356	60K97	30	14	
<input type="checkbox"/> JC LEN131 28X14 -5ZD	28 x 14	711x356	60K98	32	15	

Model No.	Dimensions (B x C)		Catalog No.	Ship. Wt.		Qty.
	in.	mm		lbs.	kg	
<input type="checkbox"/> JC LEN131 16X16 -5ZD	16 x 16	407x407	60K99	26	12	
<input type="checkbox"/> JC LEN131 18X16 -5ZD	18 x 16	457x407	61K00	29	13	
<input type="checkbox"/> JC LEN131 20X16 -5ZD	20 x 16	508x407	61K01	31	14	
<input type="checkbox"/> JC LEN131 22X16 -5ZD	22 x 16	559x407	61K02	33	15	
<input type="checkbox"/> JC LEN131 24X16 -5ZD	24 x 16	610x407	61K03	34	15	
<input type="checkbox"/> JC LEN131 18X18 -5ZD	18 x 18	457x457	61K04	31	14	
<input type="checkbox"/> JC LEN131 20X18 -5ZD	20 x 18	508x457	61K05	33	15	
<input type="checkbox"/> JC LEN131 22X18 -5ZD	22 x 18	559x457	61K06	35	16	
<input type="checkbox"/> JC LEN131 24X18 -5ZD	24 x 18	610x457	61K07	36	16	
<input type="checkbox"/> JC LEN131 20X20 -5ZD	20 x 20	508x508	61K08	34	15	
<input type="checkbox"/> JC LEN131 22X20 -5ZD	22 x 20	559x508	61K09	36	16	
<input type="checkbox"/> JC LEN131 24X20 -5ZD	24 x 20	610x508	61K10	39	18	
<input type="checkbox"/> JC LEN131 26X20 -5ZD	26 x 20	660x508	61K11	41	19	
<input type="checkbox"/> JC LEN131 22X22 -5ZD	22 x 22	559x559	61K12	41	19	
<input type="checkbox"/> JC LEN131 24X22 -5ZD	24 x 22	610x559	61K13	43	20	
<input type="checkbox"/> JC LEN131 26X22 -5ZD	26 x 22	660x559	61K14	45	20	
<input type="checkbox"/> JC LEN131 28X22 -5ZD	28 x 22	711x559	61K15	47	21	
<input type="checkbox"/> JC LEN131 24X24 -5ZD	24 x 24	610x610	61K16	45	20	
<input type="checkbox"/> JC LEN131 26X24 -5ZD	26 x 24	660x610	61K17	48	22	
<input type="checkbox"/> JC LEN131 28X24 -5ZD	28 x 24	711x610	61K18	51	23	
<input type="checkbox"/> JC LEN131 30X24 -5ZD	30 x 24	762x610	61K19	54	24	

Zone Dampers Continued on Next Page ►

ZONE DAMPER CHECKLIST - ALSO SEE DIMENSION DRAWINGS

RECTANGULAR DAMPERS - ZONE SLAVE - 16 in. (406 mm) Length Includes Damper and Incremental Actuator

Model No.	Dimensions (B x C)		Catalog No.	Ship. Wt.		Qty.
	in.	mm		lbs.	kg	
<input type="checkbox"/> JC LEN131 10X06 -3ZS	10 x 6	254x152	60K25	7	3	
<input type="checkbox"/> JC LEN131 12X06 -3ZS	12 x 6	305x152	60K26	9	4	
<input type="checkbox"/> JC LEN131 08X08 -3ZS	8 x 8	203x203	60K27	7	3	
<input type="checkbox"/> JC LEN131 10X08 -3ZS	10 x 8	254x203	60K28	9	4	
<input type="checkbox"/> JC LEN131 12X08 -3ZS	12 x 8	305x203	60K29	10	5	
<input type="checkbox"/> JC LEN131 14X08 -3ZS	14 x 8	356x203	60K30	12	5	
<input type="checkbox"/> JC LEN131 10X10 -3ZS	10 x 10	254x254	60K31	11	5	
<input type="checkbox"/> JC LEN131 12X10 -3ZS	12 x 10	305x254	60K32	13	6	
<input type="checkbox"/> JC LEN131 14X10 -3ZS	14 x 10	356x254	43N26	14	6	
<input type="checkbox"/> JC LEN131 16X10 -3ZS	16 x 10	406x254	43N27	16	7	
<input type="checkbox"/> JC LEN131 18X10 -3ZS	18 x 10	457x254	43N28	18	8	
<input type="checkbox"/> JC LEN131 20X10 -3ZS	20 x 10	508x254	43N29	19	9	
<input type="checkbox"/> JC LEN131 12X12 -3ZS	12 x 12	305x305	43N30	15	7	
<input type="checkbox"/> JC LEN131 14X12 -3ZS	14 x 12	356x305	43N31	16	7	
<input type="checkbox"/> JC LEN131 16X12 -3ZS	16 x 12	406x305	43N32	18	8	
<input type="checkbox"/> JC LEN131 18X12 -3ZS	18 x 12	457x305	43N33	20	9	
<input type="checkbox"/> JC LEN131 20X12 -3ZS	20 x 12	508x305	43N34	21	10	
<input type="checkbox"/> JC LEN131 24X12 -3ZS	24 x 12	610x305	43N35	23	10	
<input type="checkbox"/> JC LEN131 28X12 -3ZS	28 x 12	711x305	60K43	25	11	
<input type="checkbox"/> JC LEN131 30X12 -3ZS	30 x 12	762x305	60K44	27	12	
<input type="checkbox"/> JC LEN131 14X14 -3ZS	14 x 14	356x356	60K45	18	8	
<input type="checkbox"/> JC LEN131 16X14 -3ZS	16 x 14	406x356	60K46	20	9	
<input type="checkbox"/> JC LEN131 18X14 -3ZS	18 x 14	457x356	60K47	22	10	
<input type="checkbox"/> JC LEN131 20X14 -3ZS	20 x 14	508x356	60K48	23	10	
<input type="checkbox"/> JC LEN131 24X14 -3ZS	24 x 14	610x356	60K49	26	12	
<input type="checkbox"/> JC LEN131 28X14 -3ZS	28 x 14	711x356	60K50	27	12	

Model No.	Dimensions (B x C)		Catalog No.	Ship. Wt.		Qty.
	in.	mm		lbs.	kg	
<input type="checkbox"/> JC LEN131 16X16 -3ZS	16 x 16	406x406	60K51	22	10	
<input type="checkbox"/> JC LEN131 18X16 -3ZS	18 x 16	457x406	60K52	24	11	
<input type="checkbox"/> JC LEN131 20X16 -3ZS	20 x 16	508x406	60K53	26	12	
<input type="checkbox"/> JC LEN131 22X16 -3ZS	22 x 16	559x406	60K54	28	13	
<input type="checkbox"/> JC LEN131 24X16 -3ZS	24 x 16	610x406	60K55	29	13	
<input type="checkbox"/> JC LEN131 18X18 -3ZS	18 x 18	457x457	60K56	27	12	
<input type="checkbox"/> JC LEN131 20X18 -3ZS	20 x 18	508x457	60K57	29	13	
<input type="checkbox"/> JC LEN131 22X18 -3ZS	22 x 18	559x457	60K58	30	14	
<input type="checkbox"/> JC LEN131 24X18 -3ZS	24 x 18	610x457	60K59	32	15	
<input type="checkbox"/> JC LEN131 20X20 -3ZS	20 x 20	508x508	60K60	30	14	
<input type="checkbox"/> JC LEN131 22X20 -3ZS	22 x 20	559x508	60K61	32	15	
<input type="checkbox"/> JC LEN131 24X20 -3ZS	24 x 20	610x508	60K62	34	15	
<input type="checkbox"/> JC LEN131 26X20 -3ZS	26 x 20	660x508	60K63	36	16	
<input type="checkbox"/> JC LEN131 22X22 -3ZS	22 x 22	559x559	60K64	36	16	
<input type="checkbox"/> JC LEN131 24X22 -3ZS	24 x 22	610x559	60K65	38	17	
<input type="checkbox"/> JC LEN131 26X22 -3ZS	26 x 22	660x559	60K66	40	18	
<input type="checkbox"/> JC LEN131 28X22 -3ZS	28 x 22	711x559	60K67	43	20	
<input type="checkbox"/> JC LEN131 24X24 -3ZS	24 x 24	610x610	60K68	41	19	
<input type="checkbox"/> JC LEN131 26X24 -3ZS	26 x 24	660x610	60K69	43	20	
<input type="checkbox"/> JC LEN131 28X24 -3ZS	28 x 24	711x610	60K70	46	21	
<input type="checkbox"/> JC LEN131 30X24 -3ZS	30 x 24	762x610	60K71	50	23	

PRESSURE DROP - ALL ZONE AND BYPASS DAMPERS

ROUND DAMPERS

Damper Diameter		Pressure Drop	
in.	mm	in. w.c.	Pa
6	152	0.04	10
8	203	0.03	7
10	254	0.03	7
12	305	0.03	7
14	356	0.03	7
16	406	0.02	5

NOTE - Pressure drop is at 1000 feet per minute (305 m per minute) velocity.

RECTANGULAR DAMPERS

Damper Size		Pressure Drop	
in.	mm	in. w.c.	Pa
10 x 6	254 x 152	0.005	1
12 x 6	305 x 152	0.005	1
8 x 8	203 x 203	0.005	1
10 x 8	254 x 203	0.005	1
12 x 8	305 x 203	0.005	1
14 x 8	356 x 203	0.005	1
10 x 10	254 x 254	0.005	1
12 x 10	305 x 254	0.005	1
14 x 10	356 x 254	0.005	1
16 x 10	406 x 254	0.005	1
18 x 10	457 x 254	0.005	1
20 x 10	508 x 254	0.005	1
12 x 12	305 x 305	0.005	1
14 x 12	356 x 305	0.005	1
16 x 12	406 x 305	0.005	1
18 x 12	457 x 305	0.005	1
20 x 12	508 x 305	0.005	1
24 x 12	610 x 305	0.01	2
26 x 12	660 x 305	0.01	2
28 x 12	711 x 305	0.01	2
30 x 12	762 x 305	0.01	2
14 x 14	356 x 356	0.005	1
16 x 14	406 x 356	0.005	1
18 x 14	457 x 356	0.01	2
20 x 14	508 x 356	0.01	2
24 x 14	610 x 356	0.01	2
28 x 14	711 x 356	0.01	2

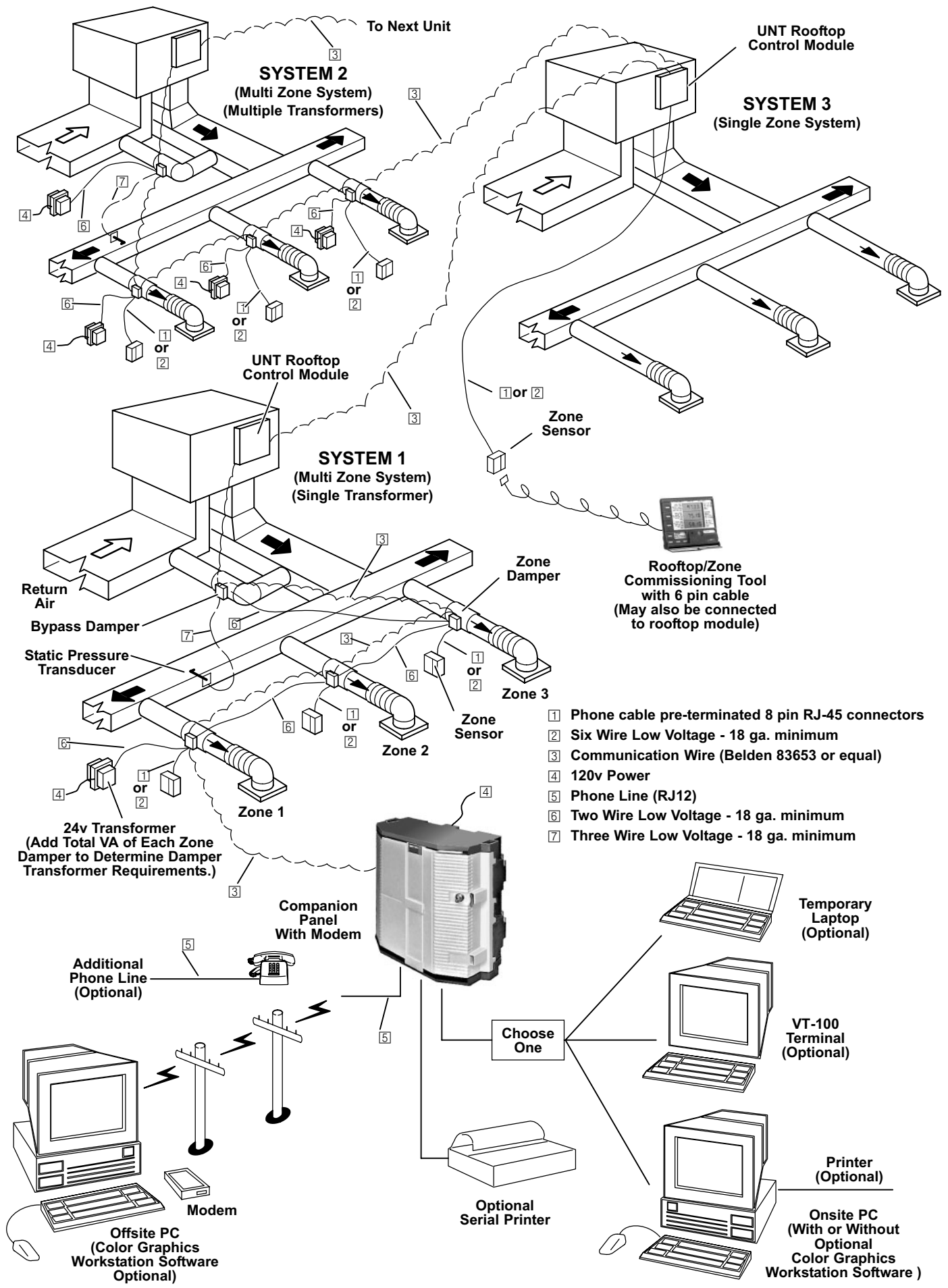
NOTE - Pressure drop is at 1000 feet per minute (305 m per minute) velocity.

RECTANGULAR DAMPERS

Damper Size		Pressure Drop	
in.	mm	in. w.c.	Pa
16 x 16	406 x 406	0.01	2
18 x 16	457 x 406	0.01	2
20 x 16	508 x 406	0.01	2
22 x 16	559 x 406	0.02	5
24 x 16	610 x 406	0.02	5
18 x 18	457 x 457	0.02	5
20 x 18	508 x 457	0.02	5
22 x 18	559 x 457	0.02	5
24 x 18	610 x 457	0.03	7
30 x 18	762 x 457	0.04	10
20 x 20	508 x 508	0.03	7
22 x 20	559 x 508	0.03	7
24 x 20	610 x 508	0.03	7
26 x 20	660 x 508	0.04	10
30 x 20	762 x 508	0.05	12
36 x 20	914 x 508	0.06	15
22 x 22	559 x 559	0.04	10
24 x 22	610 x 559	0.04	10
26 x 22	660 x 559	0.05	12
28 x 22	711 x 559	0.06	15
36 x 22	914 x 559	0.07	17
24 x 24	610 x 610	0.05	12
26 x 24	660 x 610	0.06	15
28 x 24	711 x 610	0.07	17
30 x 24	762 x 610	0.07	17

NOTE - Pressure drop is at 1000 feet per minute (305 m per minute) velocity.

APPLICATIONS - TYPICAL SYSTEM LAYOUT



- 1 Phone cable pre-terminated 8 pin RJ-45 connectors
- 2 Six Wire Low Voltage - 18 ga. minimum
- 3 Communication Wire (Belden 83653 or equal)
- 4 120v Power
- 5 Phone Line (RJ12)
- 6 Two Wire Low Voltage - 18 ga. minimum
- 7 Three Wire Low Voltage - 18 ga. minimum

APPLICATIONS - OVERVIEW

Introduction

The L Zone system is an affordable solution for zoning both large and small building complexes with areas served by one heating and air conditioning system. It is a very attractive component to building owners and operators with ever increasing demand for quality temperature control features. It offers both system simplicity and superior temperature control technology.

Due to the increasing demand for zoning systems Lennox will factory install and test the UNT Controller in every rooftop unit shipped for L Zone applications. UNT Controller may also be field installed. The rooftop units are factory ready for stand alone operation and will operate at pre-defined set points.

The L Zone System is a fully modulating zone control system with auto changeover and bypass damper control. One Companion Panel controlling multiple HVAC units and zone dampers simplifies the control of the building by providing one central location to store most of the system operating parameters.

NOTE - The L Zone System is designed for use with all L Series commercial packaged gas and packaged cooling rooftop units, 3 through 30 tons. It may also be used with LSA split systems. It does not support heat pump units.

The Companion Panel is U.L. and C.S.A. approved.

System Capability

1. 48 zones is the maximum number of zones which can be connected to a Companion Panel, assuming that the 800 points maximum limit is not exceeded. Multiple Companion Panels must be used when the maximum number of zones is exceeded.

2. The maximum amount of zones per rooftop unit shall not exceed 15 zones. The number of zones can be expanded by adding additional Companion Panels. This allows an unlimited number of zones per application.

3. The maximum number of zones for each Companion Panel is relative to the number of rooftop units connected to the system. The Companion Panel is capable of handling a total of 800 points. The following is the quantity of points required for each controller. By adding all point requirements, the total amount of zones per companion can be determined without exceeding 800 points.

Rooftop Units	.....	34 points X =
Bypass Damper	.....	5 points X =
Zone Damper	.....	10 points X =
		Total / Companion =

Examples:

A building has a total of 6 rooftop units. 5 out of the 6 rooftop units have 10 zones each and 1 rooftop has a single zone application (zone and bypass dampers not required). Determine the total amount of points:

Rooftop Unit	.....	34 points X 6 rooftops = 204
Bypass Damper	.....	5 points X 5 dampers = 25
Zone Dampers	.....	10 points X 45 dampers = 450
		Total / Companion = 679

This system can therefore be applied with 1 Companion panel.

Should the quantity of rooftop units change to 7 units in total, (6 units with 10 zones each and 1 single zone) then the point count would be as follows:

Rooftop Units	.....	34 points X 7 rooftop = 238
Bypass Dampers	.....	5 points X 6 dampers = 30
Zone Dampers	.....	10 points X 60 dampers = 600
		Total / Companion = 868

This system would require 2 Companion Panels.

Typical System Layout (See Illustration on Page 14)

Application Summary

The L Zone system combines constant volume single package HVAC equipment with electronic damper controls to vary air volume for zoning. Basic guidelines for good general design practices also apply to designing zoning systems.

Determine which building areas require zoning. Smaller buildings may require one HVAC unit combined with L Zone system components. Medium to large buildings may require multiple HVAC units with L Zone system components

Sections of buildings served by an area zone system (one HVAC unit with zone dampers) should have similar system schedules, similar internal or solar heat gain and loss profiles and similar heating, cooling, and ventilation requirements. Do not group areas that have need for **both** heating and cooling with areas requiring continuous high demand for cooling only.

Careful attention should be given to designing duct systems applied with the L Zone system.

For example, the system relies on the fact that areas requiring heating be satisfied quickly so that the system may switch to cooling. The reverse is also true. This assures that ample capacity is available to satisfy a given mode in a relatively short period of time.

Another factor, referred to as the "rate of change", is also important. This is the amount of time before a satisfied zone once again requires air conditioning. A large computer room would be an example of an area that has a high rate of change. It would be considered improper design to include a large computer room within an area zone system that also serves normal loads. A separate HVAC unit for the computer room would be the ideal solution (only if the computer room can be served with non specialized HVAC equipment). The goal is to keep all zones served by the L Zone system within 1 to 2 degrees of room setpoint.

Use the following guidelines to divide the area into separate zones:

- Area zoning (one HVAC unit with zone dampers) should not combine both interior and exterior areas.
- Area zoning should not include different usage areas. Generally, do not combine an area that has a wide range of occupancies or load levels in the same zone area that has a constant or predictable load. Example: a conference room combined with individual offices.
- Building areas combined into one zone should have the same sun exposure. They should also have the same exterior glass area. Example: do not combine a corner office with two exposures with an office with only one side exposure.
- Determine if offices with similar exposure should be designed as one common zone. Determine if the occupants of each area would be comfortable at the same temperature.
- In any system decision, economic considerations are important. Common sense must be used when zoning, to ensure that, whenever possible, decisions are based on optimizing system efficiency and economy, but not at the expense of occupant comfort.

APPLICATIONS - OVERVIEW (CONTINUED)

Zone Sensor location is very important!

Do not install sensors in direct sunlight, in close proximity to a supply air diffuser, on exterior walls, in close proximity to exterior doors, or close to a heat source. Be aware that metal column enclosures could cause cold surface temperatures.

The location of the sensors in zoning applications must be such that sensors will not interfere with one another. Remember, zoning systems are designed to control individual rooms and not designed to control common areas.

Averaging the space temperature in large common areas, can be achieved by adding additional sensors. The number of sensors should reflect proper engineering practices.

The wall sensor should be mounted approximately 5 ft. (1.5 m) above the finished floor. Refer to local code requirements for handicap height requirements. The wall sensor must be installed in an area where the temperature will be maintained between 32°F to 131°F (0°C to 55°C); humidity must be within 0-100% RH (non-condensing).

Bypass Damper Sizing

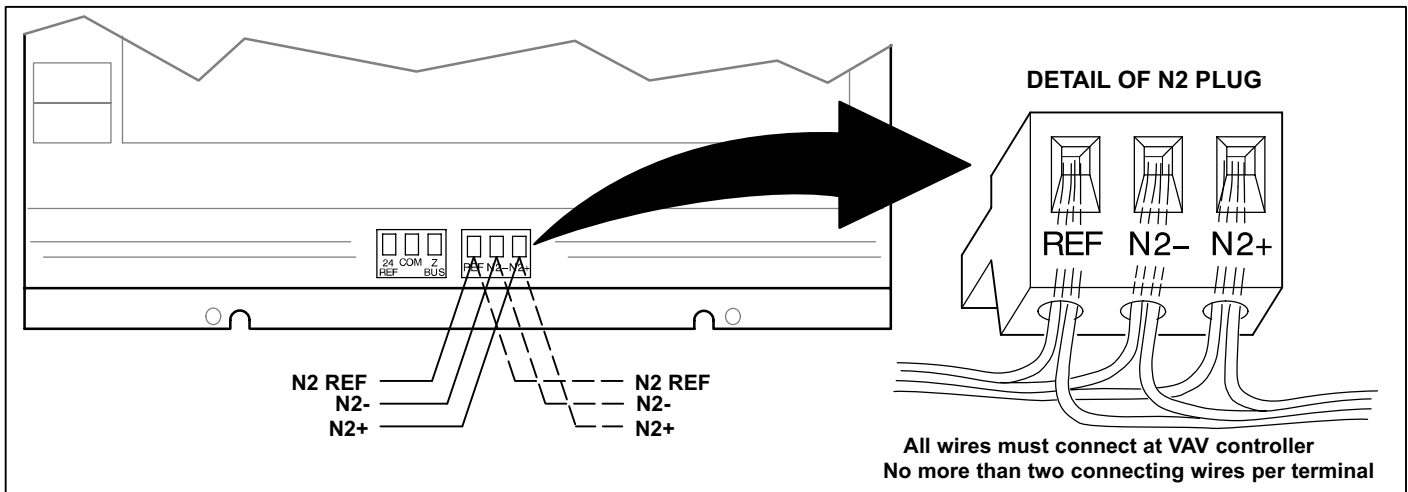
Bypass damper sizing should be selected based on the following:

TOTAL AIR VOLUME minus SMALLEST ZONE AIR VOLUME = BYPASS AIR VOLUME

The bypass damper dimension must be selected using the BYPASS AIR VOLUME at a damper velocity of 1500 fpm (7.6 m/s).

Note - The smallest zone air volume must be at least 10% of the total air volume or whichever is greater.

VAV141 Zone/Bypass Module Controller Connections



Supply Air Diffusing

The correct supply outlets, properly sized and located, control the air pattern within a given space to obtain proper air motion and temperature equalization. Outlets should be sized to project air so that velocity and temperature reach acceptable levels before entering an occupied zone.

All air diffusing equipment should be selected using a low diffuser noise criteria (NC) rating of between 15 to 20 NC (Approximately its mid-point capacity). This selection process will allow the diffuser to operate at a lower velocity and pressure, allowing for flexibility with slight increases in air quantities during the system pressure stability period (approximately 5 to 10 seconds).

The first 10 ft. (3 m) of ductwork, upstream from the diffusers, should be acoustically insulated.

The smallest zone must be capable of delivering a minimum of 10% of the total air volume without diffusers exceeding a 32 NC rating.

Manual balancing damper should be installed upstream from all zone dampers.

N2 Communication Bus

The N2 Communication Bus is a local network that allows the Companion Panel to communicate with other devices such as the Companion Panel, VAV Damper Controllers and UNT Rooftop Modules. The N2 Bus uses a master/slave protocol in which the master device, the Companion Panel, initiates communication with all other devices. The Bus must be connected in a daisy-chained fashion. The maximum N2 length without additional hardware is 5000 ft. (1525 m).

The N2 Bus shall be a solid type 18 AWG wire: Belden 83653 tinned copper conductor insulated, aluminum-polyester shield with 85% tinned copper braid shield and Teflon jacket. NEC 800 listed for use in an air plenum non-conduit. Refer to local codes.

ATTENTION: Do not run N2 Bus AI, BI, AO or BO wiring in the same conduit as line voltage wiring (30 VAC or more), or wiring that switches power to highly inductive loads such as contactors, coils, motors or generators. **The use of wire nut connectors or wire end connections between modules on the N2 wires is strictly prohibited!**

The operating environment for the N2 Bus must maintain temperatures within the range of 32°F to 122°F (0°C to 50°C) while maintaining relative humidity at values of 0 to 95% RH (non-condensing).

We strongly recommend a wiring diagram be provided as part as the design process for the N2 layout. The diagram will indicate the location chosen to run the N2 as well as the address of each component connected to the N2. Refer to the Address Network Worksheet on next page.

Setting the N2 address

The switches located in the upper right corner of the UNT and VAV modules are set to the same number as was assigned to that module through the software. The Companion Panel uses this address for polling and commanding. The numbers are in binary format and vertically arranged with the least significant digit to the right.

For example, if the controller address is 17 (decimal), the binary representation is 00010001-Switches "1" and "16" must be set to the "On" position (1+16=17).

IMPORTANT: When setting the N2 Address, do not use the same address twice.

ADDRESS NETWORK WORKSHEET (EXAMPLES GIVEN IN 1ST TWO SECTIONS)

PROJECT: Rooftop # 1 with (3) zones associated / Rooftop #2 with (3) zones associated / Rooftop #3 is single zone

EQUIPMENT TYPE	ADDRESS	EQUIPMENT TYPE	ADDRESS
ROOFTOP UNIT # 1	10	ROOFTOP UNIT #	
Bypass # 1	1	Bypass #	
Zone # / Damper # 1 - 1	11	Zone # / Damper #	
Zone # / Damper # 1 - 2	12	Zone # / Damper #	
Zone # / Damper # 1 - 3	13	Zone # / Damper #	
Zone # / Damper # 1 - 4	14	Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
ROOFTOP UNIT # 2	20	ROOFTOP UNIT #	
Bypass # 1	2	Bypass #	
Zone # / Damper # 2 - 1	21	Zone # / Damper #	
Zone # / Damper # 2 - 2	22	Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
ROOFTOP UNIT # 3		ROOFTOP UNIT #	
Bypass #		Bypass #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
ROOFTOP UNIT #		ROOFTOP UNIT #	
Bypass #		Bypass #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	
Zone # / Damper #		Zone # / Damper #	

