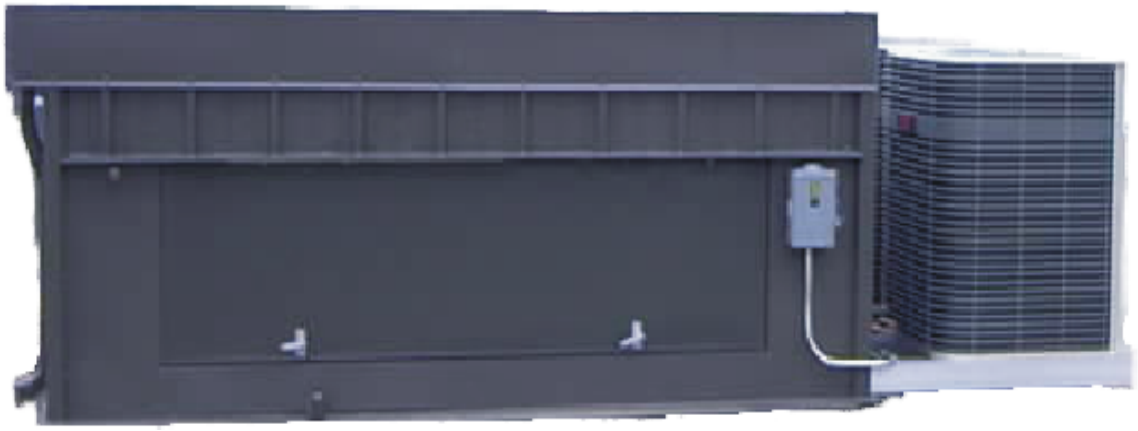
CME

Custom Mechanical Equipment LLC

ROOFTOP UNITS



PVZ

Penthouse Variable Zone Units

2101 Hall Blvd.
Ponca City, OK 74601

Toll Free: 866-687-9803
Fax: 580-762-4117

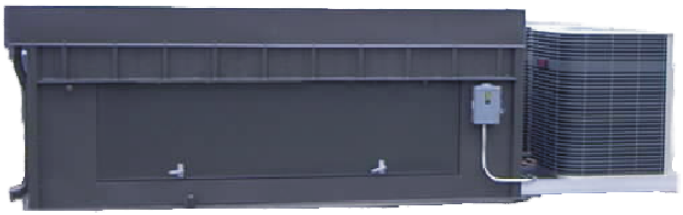
PVZ Advantages

Highly Efficient Systems

94.3% AFUE Gas Heating (Two Stage)
11.5 EER Condensing Units (Average)
Multiple speed DC inverted fan motors
Modulating Economizers
Individual Zone Control
Energy Management Options

Simple Maintenance

LENNOX® MPV Series Two-Stage Heating
Direct Expansion Cooling
Readily Available Components
Walk-in Unit Housing
True Zone Independence



Superior Warranties

Heat Exchanger.....20 years
Compressor .....5 years
Furnace Motor..... 1 year
Ignition Control..... 1 year

Ventilation Codes

Meets ASHRAE 62-1996 ventilation requirements with proper application. Several options are available for individual zone ventilation control.

Flexibility

Each unit is custom built to meet design requirements with 1 to 4 control zones, 3 to 12 tons of cooling and 80 to 200 MBH of heating. Unit base and duct connections are built to match existing or new roof curbs. Heating is available in natural gas and liquid propane fuels.

Existing Problems

Drafts, Hot/Cold Spots, Stale Air
Most buildings are plagued with a variety of comfort complaints and most HVAC systems lack the flexibility to meet today's diverse heating, cooling and ventilation requirements. With traditional systems, a single component failure can disable a large portion of your facility.

High Maintenance Costs
Today's commercial HVAC market focuses too much on "engineering economics" and too little on the end user. The drive for the lowest initial cost has produced excessive long-term operating costs. Complicated system controls require continual maintenance, limit the field of qualified service technicians and often rely too heavily on individual components with little or no redundancy.

High Energy Costs
Cooling and heating efficiencies have increased significantly over the past 15 years. Traditional multizones and VAV systems cool and heat simultaneously, resulting in significant energy waste. Many of today's manufacturers continue to lag behind the advances of the past 15 years.

Long Lead Times
Most manufacturers need 2 to 4 months to deliver their equipment after the submittal process. This delays the job several months after funding is obtained.

Installation Difficulties
Most retrofit units need adapter curbs and many need extensive duct modifications. Most equipment is shipped via common freight, leaving the contractor responsible for tracking delivery. During this process, getting competent assistance is virtually impossible.

PVZ Solutions

Occupant Comfort
With independent heating and cooling systems, the PVZ distributes hot and cold air where needed. With multiple economizers, the PVZ directs ventilation air to each zone without "reheat". The independent supply fans automatically adjust with system pressure changes and minimize drafts by reducing airflow when possible. Achieving comfort has never been this simple.

Simple Maintenance
The PVZ is simple to maintain. Scroll compressors and standard operating controls allow for fewer parts to maintain and thus, fewer parts to fail. The conditioned penthouse protects the equipment and helps technicians complete their work quickly and thoroughly. If a component fails, a small fraction of your facility is affected while repairs are completed quickly and inexpensively with standard components.

Highly Efficient Equipment
The PVZ slashes energy costs with proven, highly efficient equipment not available in today's commonly used systems. With independent cooling, heating and ventilation, we avoid the inherent complexity and inefficiencies of other multi-zone and central station systems.

Short Lead Times
Standard lead-time for a PVZ is approximately four to six weeks. An emergency replacement unit can normally be built, delivered and operational in less than two weeks.

Easy Installation
The PVZ is easy to install. In retrofits, each unit is built to match existing conditions. All accessory materials are transported in lifting baskets and shipping is closely monitored to assure on-time delivery. A factory-employed project manager provides on-site expertise and start-up supervision to ease your concern.

PVZ Standard Features

G61 MPV Series Two-Stage Heating
A Sure Light ™ integrated control board contains all controls for reliable, trouble-free performance. The Limited lifetime warranty coverage on heat exchanger is twenty (20) years in all non-residential application.

Variable Speed Blower
A commercial, variable speed blower provides soft-start capability and a variety of airflow settings. Selected airflow is maintained throughout the static pressure range. The blower is mounted on a slide-out frame for easy service.

High Efficiency DX Cooling
Nominal condensing unit capacities range from 3 to 6 tons. All units include Copeland Compliant Scroll compressors for reliability with an average system EER is 11.5.

Economizers
Factory-wired enthalpy based economizers with low-leak dampers and common pressure relief dampers provide "free" cooling.

Custom Fabrication
Each unit is custom designed to match existing or new roof curb, ducting and zone control requirements.

Smoke Detector
A smoke detector is factory installed and wired in the return air section. Contacts are provided for remote interface.

LENNOX Warranties
A standard one-year limited warranty covers the entire unit. Extended warranties are included to cover the heat exchanger (twenty years), refrigerant compressor (five years), ignition control (one year) and blower motor (one year).

Factory Authorized Supervision
Factory authorized on-site installation supervision, start-up assistance and training are provided with each installation.

Coordinated Freight
All shipments are scheduled and controlled to ensure on-time arrival.

Optional Electric Heat
PVZs have the ability to provide 5-30 kW of electric heating.

Equipment Performance

G61MPV-110-SPECIFICATIONS	
Model No.	**G61MPV-110**
Input - Btuh (kW) (High Fire)	110,000 (32.2) Low Fire 75,000 (22.0)
OUTPUT - BTUH (kW)	104,000 (30.5) Low Fire 72,000 (21.1)
*A.F.U.E.	94.3%
Maximum External Static Pressure - in w.g. (Pa)	1.2 (298)
California Seasonal Efficiency	90.1%
Temperature rise range - °F (°C)	40-70 (22-39)
Blower Wheel Nominal Diameter x Width - in. (mm)	11-1/2x9 (292x229)
Blower motor output - hp (W)	1 (746)
Filter Size (1 per system) - in. (mm)	20x25x1 (508x635x25)
Electrical characteristics	120 volts-60hertz- 1 phase

- Annual Fuel Utilization Efficiency based on D.O.E. test procedures and according to F.T.C. labeling requirements. Isolated combustion system rating for non- weatherized furnaces.

CB31MV-65 SPECIFICATIONS		
Model No.		**CB31MV-65**
Evaporator coil	Net face area-sq.ft.(m2)	7.22 (0.67)
	Tube diameter-in(mm)	3/8(9.5)
	No. Of rows	3
	Fins per inch(fins per m)	12 (472)
Refrigerant		HCFC-22

Equipment Performance

BLOWER PERFORMANCE (Measured in **CFM**)													
Jumper Setting	Static Press. (in. w.c.)	Low Speed				High Speed				Heat Speed			
(All in **CFM**)		1	2	3	4	1	2	3	4	1	2	3	4
Norm	0.10	1012	1076	1225	1337	1431	1536	1744	1949	1341	1509	1716	1870
	0.50	989	1062	1193	1361	1467	1584	1758	1976	1371	1558	1742	1897
	1.00	933	993	1148	1326	1467	1577	1758	1970	1374	1561	1723	1896
	1.20	908	979	1140	1315	1455	1564	1748	1946	1365	1545	1708	1877
+	0.05	1113	1184	1348	1471	1574	1690	1918	2144	1487	1670	1884	2086
	0.50	1088	1168	1312	1497	1617	1733	1949	2181	1531	1718	1895	2112
	1.00	1026	1092	1263	1459	1619	1714	1935	2132	1521	1704	1895	2087
	1.20	999	1077	1254	1447	1608	1693	1917	2088	1510	1685	1884	2063

BLOWER PERFORMANCE (Measured in **WATTS**)													
Jumper Setting	Static Press. (in. w.c.)	Low Speed				High Speed				Heat Speed			
(All in **Watts**)		1	2	3	4	1	2	3	4	1	2	3	4
Norm	0.10	101	117	160	198	214	263	361	497	184	254	348	444
	0.50	212	238	282	347	356	409	528	662	310	404	503	615
	1.00	287	326	388	471	511	573	711	873	459	566	676	807
	1.20	343	377	445	535	562	642	763	934	517	633	732	875
+	0.10	111	129	176	218	235	289	397	547	246	332	456	592
	0.50	233	261	310	381	437	499	645	852	384	491	604	778
	1.00	316	359	426	518	606	671	835	1032	551	655	797	978
	1.20	377	415	490	589	667	733	913	1088	615	715	860	1041

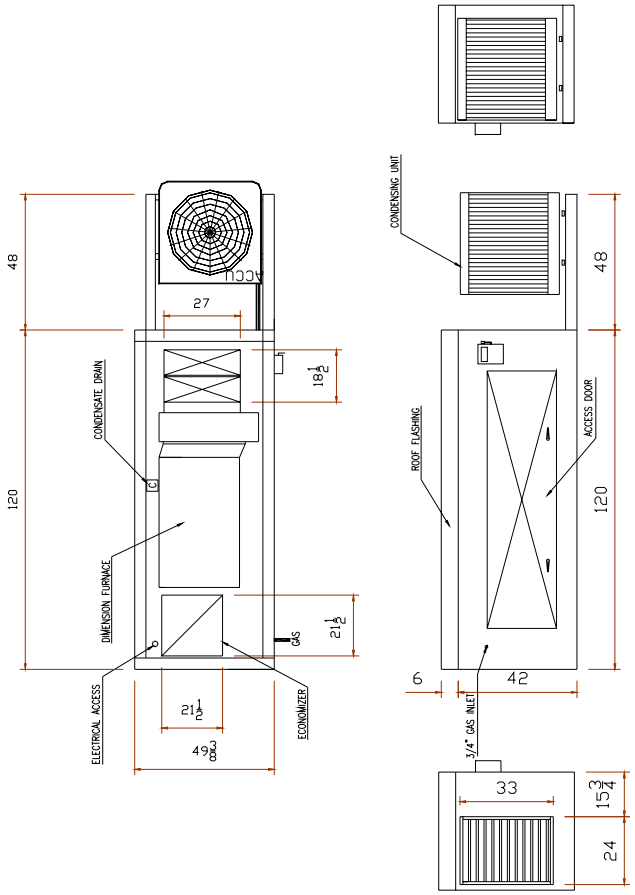
Equipment Performance

ACCU SPECIFICATIONS						
Model No.			**HS26-036**	**HS26-048**	**HS26-060**	**HS29-072**
Condenser Coil	Net face area sq. Ft(m2)	Outer	15.9 (1.48)	18.2 (1.69)	21.6 (2.01)	12.92 (1.20)
		Inner	15.3 (1.42)	13.3 (1.24)	20.8 (1.93)	12.59 (1.17)
	Tube diameter-in. (mm)		3/8 (9.5)	5/16 (7.9)	5/16 (7.9)	3/8 (9.5)
	No. Of rows		2	1.75	2	2
	Fins per inch (m)		20 (787)	22 (866)	22 (866)	20 (787)
Condenser Fan	Dia.-in. (mm)/# of blades		24 (610)/4	24 (610) / 4	24 (610) / 4	24 (610) / 4
	Motor hp (W)		1/6 (124)	¼ (187)	¼ (187)	½ (383)
	Cfm (L/s)		3000 (1415)	3900 (1840)	4200 (1980)	4500 (2125)
	Rpm		820	820	820	1060
	Watts		230	310	350	620
*HCFC-22-charge furnished			9 LBS. (4.08 KG)	7 LBS. 5 OZ. (3.32 KG)	10 LBS. 8OZ. (4.76 KG)	NONE
Liquid line (o.d.)in. (mm) sweat			3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	5/8 (15.9)
Suction line(o.d.)in. (mm) sweat			¾ (19)	7/8 (22.2)	1-1/8 (28.6)	1-1/8 (28.6)
Shipping weight-lbs (kg) 1 package			233 (106)	307 (139)	320 (145)	354 (161)

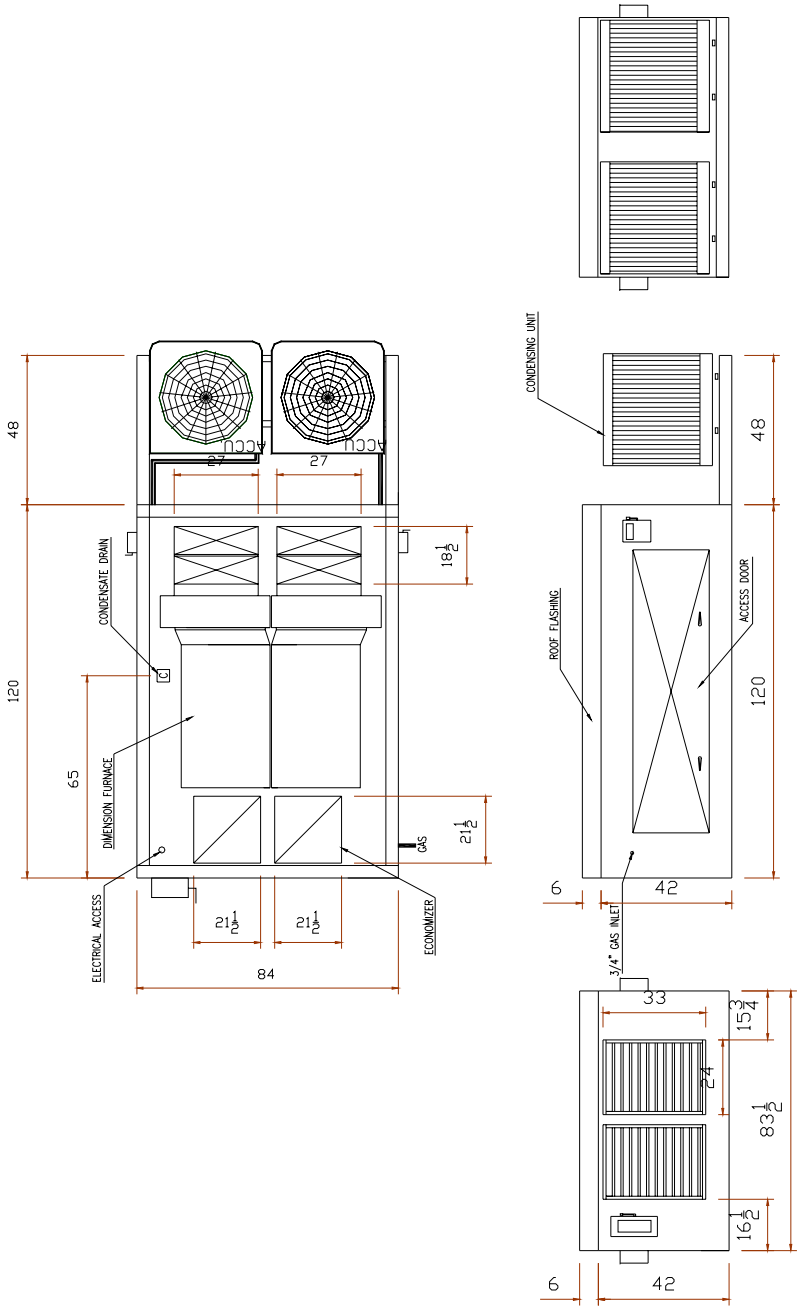
- Refrigerant charge sufficient for 20-ft.(6.1 m) length of refrigerant lines.

ARI RATING				CONDENSING UNITS	
Unit Size & Model No. Sound Rating Number (db)	**EER***	**ARI Total Cooling Capacity**		**Evaporator Coil**	**Expansion Valve Kit**
		BTUH	**kW**		
(3T) HS26-036 (74.0)	12.2	37,000	3.04	MV-65	Factory Installed
(4T) HS26-048 (76.0)	11.5	49,500	4.325	MV-65	Factory Installed
(5T) HS26-060 (76.0)	11.4	60.000	5.26	MV-65	Factory Installed
(6T) HS29-072 (86.0)	9.2	65,000	7.04	MV-65	Factory Installed

- Rated in accordance with ARI standard 210/240; 95 °F (35 °C) outdoor air temperature, 80 °F (27 °C)DB/67 °F (19 °C) WB entering evaporator air with 25 ft.(7.6 m)of connecting refrigerant lines.



LENNOX INDUSTRIES INC. CME CUSTOM MECHANICAL EQUIPMENT 2080 Energy Drive East Troy, WI 53120 Phone: (262) 642-9803 Fax: (262) 642-9874	This drawing is property of Custom Mechanical Equipment and is loaned in confidence for use in connection with our work. It is not to be reproduced in any manner or submitted to outside parties for examination or used directly or indirectly for purposes other than those for which it was furnished without written consent.	Description: PVZ General Arrangement 3 – 6 Ton Unit Drawn By: KFB Date: 2-21-01	Scale: Revision: 0 Drawing Number 1 OF 1



LENNOX INDUSTRIES INC.

CME
CUSTOM MECHANICAL EQUIPMENT

2080 Energy Drive
East Troy, WI 53120
Phone: (262) 642-9803
Fax: (262) 642-9874

Description	Scale	Revision
PVZ General Arrangement 6 – 12 Ton Unit		0
	Drawing Number	
Drawn By: CRD	Date: 2-21-01	1 OF 1

PVZ Sequence of Operation

The Automated Logic solid state panel controls all PVX functions. The Automated Logic solid state panel changes blower speeds, enables heating and cooling, provides minimum ventilation and disables equipment for night setback operation and emergency shutdown. Independent zone temperature control is regulated by individual LENNOX thermostats or interface with an independent building automation system.

VENTILATION MODE

When power is supplied to the unit, each blower is enabled at its manually adjustable ventilation blower speed. Each economizer is driven to its manually adjustable minimum position.

HEATING MODE

Upon a zone heating call, the corresponding heating section is enabled. The corresponding blower is ramped to its manually adjustable high speed. When the zone heating demand is met, the blower returns to the ventilation mode.

COOLING MODE

Upon a zone cooling call, the corresponding blower is ramped to its manually adjustable high speed. The outdoor air sensor for that zone is enabled (enthalpy or dry bulb). If outdoor conditions permit, the mixed air temperature control modulates economizer dampers to maintain a fixed mixed air temperature. Otherwise, the corresponding condensing unit is enabled to provide mechanical cooling. When the zone cooling demand is met, the blower returns to the ventilation mode.

SUBZONE CONTROL

Upon a single cooling or heating call, corresponding blower remains at its manually adjustable low speed, corresponding zone damper is opened, opposite zone damper is closed to its manually adjustable minimum position and cooling or heating is enabled with integral compressor anti-cycle protection, high temperature protection and low temperature protection. Upon simultaneous heating and cooling calls, system adjusts to satisfy first call received. Integral time sharing function will switch to opposite call if initial zone is not satisfied within 10 minutes. Upon two cooling or heating calls, corresponding blower is ramped to its manually adjustable high speed, both dampers are opened and heating or cooling is enabled.

NIGHT SETBACK OPTION

During occupied periods, the PVZ operates as described above. During unoccupied periods, the unit is idle with all outdoor air dampers closed. During a call for heating or cooling, the PVZ is enabled as described above except all outdoor air dampers remain closed. When the demand is met, the unit is idle. A T7300 programmable thermostat or building automation system can provide the digital inputs required for this operation.

ENERGY MANAGEMENT INTERFACE OPTION

An interface panel can be factory installed to accept heating, cooling and night setback dry contacts from any independent building automation system. Sensors and monitor points are factory-installed to allow remote monitoring of the PVZ. Control hardware, software and wiring diagrams are all provided by others.

Commercial Product Installation

FACILITY	CONTACT PERSON	PHONE NUMBER
OLATHE DISTRICT SCHOOLS OLATHE, KS	ENERGY MANAGER ROBERT COURTNEY HVAC DIRECTOR CURT FISHER	(913) 780-7011
SOUTH HARRISON SCHOOL BETHANY, MO	SUPERINTENDENT LYLE OLIVER	(816) 425-8044
ROUND ROCK INDEPENDENT SCHOOL DISTRICT ROUND ROCK, TX	PROJECT MANAGER RICK CONRAD	(512) 464-5014
MESA PUBLIC SCHOOL MESA, AZ	DIRECTOR OF CONSTRUCTION DAVID PETERSON	(602) 472-6030
FIDELITY FEDERAL BANK STANTON, CA	ONTARIO REF. (CONTRACTOR) TIM MELTON	(909) 984-2771
CUESTA COLLEGE SAN LUIS OBISPO, CA	HVAC DIRECTOR TERRY REECE	(805) 546-3100
KERR MANUFACTURING DETROIT, MI	GUARDIAN ENVIRONMENTAL SERVICES (CONTRACTOR) TOM BARKER	(734) 513-9500
BLAIR SCHOOL DISTRICT BLAIR, NE	HVAC DIRECTOR RICK BRANDT	(402) 426-2610
BAKERSFIELD SCHOOL DIST. BAKERSFIELD, CA	HILLCREST-HVAC (CONTRACTOR) TOM RAMSRUD	(661) 335-1500
ANDERSON COUNTY SCHOOLS CLINTON, TN	HVAC DIRECTOR STAN CURTIS	(423) 457-6272