



VERTIV GUIDE SPECIFICATION

Vertiv™ Liebert® DM

Precision Air Conditioner

1. GENERAL

1.1. Summary

This specification describes the requirements for an environmental control system. The system is designed to maintain temperature and relative humidity conditions in rooms containing electronic equipment.

1.2. Design Requirements

The environmental control system is a Vertiv™ Liebert® DM factory assembled unit that is floor mounted, optimized for maximum cooling capacity in a minimum footprint with downflow and upflow air delivery (limited to 22 kW & 27 kW). It is specifically designed for service from the front and sides of the unit. The system is designed to ensure even air distribution to the entire face area of the coil.

- Liebert DME7

Each system is capable of handling up to 2000 CMH airflow. It has a net sensible cooling capacity rated no less than ____ kW, based on the entering air condition of ___°C dry bulb, ___% relative humidity and ___°C ambient temperature. These units are supplied with 400 V (+/- 10%) 3 Phase, 50 Hz power supply.

- Liebert DME12

Each system is capable of handling up to 3300 CMH airflow. It has a net sensible cooling capacity rated no less than ____ kW, based on the entering air condition of ___°C dry bulb, ___% relative humidity and ___°C ambient temperature. These units are supplied with 400 V (+/- 10%) 3 Phase, 50 Hz power supply.

- Liebert DME17

Each system is capable of handling up to 4300 CMH airflow. It has a net sensible cooling capacity rated no less than ____ kW, based on the entering air condition of ___°C dry bulb, ___% relative humidity and ___°C ambient temperature. These units are supplied with 400 V (+/- 10%) 3 Phase, 50 Hz power supply.

- Liebert DME22

Each system will be capable of handling up to 6300 CMH (@downflow) & 6000 CMH (@up flow) airflow. It will have a net sensible cooling capacity rated no less than ____ kW, based on the entering air condition of ___°C dry bulb, ___% relative humidity and ___°C ambient temperature. These units will be supplied with 400 V (+/- 10%), 3 phase, 50 Hz power supply.

- Liebert DME27

Each system is capable of handling up to 8100 CMH (@downflow) & 7300 CMH (@upflow) airflow. It has a net sensible cooling capacity rated no less than ____ kW, based on the entering air condition of ___°C dry bulb, ___% relative humidity and ___°C ambient temperature. These units are supplied with 400 V (+/- 10%), 3 Phase, 50 Hz power supply.

1.3. Submittals

Submittals will be provided with the proposal and will include: Dimensional, installation, refrigerant – hydraulic & electrical connections data, and circuit drawings.

1.4. Warranty

The system will be provided with a warranty against the defects in material and workmanship.

1.5. Quality Assurance

The system is designed and manufactured according to world-class quality standards. The manufacturer has an ISO 9001 certified and the unit has a CE certification.

2. PRODUCT

2.1. Cooling Circuits

The refrigeration system of Vertiv™ Liebert® DME Units consist an R410A based scroll compressor, evaporator coil, condenser coil, thermostatic expansion valve, high-pressure safety switch, and filter dryer. The compressor is equipped with a suction gas-cooled motor, vibration isolators, internal thermal overloads, manual reset high-pressure switch, a low pressure & high-pressure transducer, and crankcase heater.

The evaporator coil is manufactured from copper tubes and aluminum fins, with a condensate drain pan.

For Liebert DME7, the evaporator coil has a 0.3 m² face area with a maximum face velocity of 1.85 m/s at 2000 CMH.

For Liebert DME12, the evaporator coil has a 0.44 m² face area with a maximum face velocity of 1.88 m/s at 3000 CMH.

For Liebert DME17, the evaporator coil has a 0.75 m² face area with a maximum face velocity of 1.58 m/s at 4300 CMH.

For Liebert DME22, the evaporator coil has a 0.94 m² face area with a maximum face velocity of 1.86 m/s at 6300 CMH (downflow version). In the case of upflow maximum face velocity is 1.77 m/s at 6000 CMH.

For Liebert DME27, the evaporator coil has a 1.26 m² face area with a maximum face velocity of 1.79 m/s at 8100 CMH (downflow version). In the case of upflow maximum face velocity is 1.61 m/s at 7300 CMH.

2.2. Fan Section

The Liebert DME series is equipped with a direct driven centrifugal fans that are highly efficient and reliable. The fans draw air through the coil which is located on the top front side of the unit for upflow, and within the cabinet for downflow. The EC fans are optional offering for 7 kW & 12 kW models.

2.3. Cabinet and Frame

The exterior steel panels are custom made and powder coated to protect against the corrosion. The wall-constructed side panels are separated by a 15 mm, 28 kg/m³ (1.75 lb/ft³) insulation from the airstream. The units are also provided with leveling feet. The perforated inlet and outlet panels have an opening area of 75%.

2.4. Air Filtration

The Liebert DME unit is equipped with one set of nylon air filters, located within the cabinet, and accessible from the front side of the unit. The filter can be washed repeatedly.

2.5. Refrigerant

The Liebert DME series is suitable for operation with an R410A refrigerant, all models are capable to deliver optimum capacity with energy-efficient refrigerant i.e. R410A.

2.6. Unit Control

2.6.1. Micro-processing Controller

Liebert DM models are controlled by an intelligent control board with a 7-inch color touch screen that provides a user-friendly interface with multi-level password protection, self-recovery upon power failure, high-voltage & low-voltage protection, phase loss protection, and automatic phase-sequence switching upon anti-phase.

The microprocessor-based control board allows setting and monitoring of the following room space parameters:

- Air Inlet Temperature
- Return Temperature Setpoints
- Humidity (Inlet)
- Humidity Setpoints
- Fan Output
- Heating Status
- Condensate Pressure
- Humidifier Status
- Supply Voltage

Example of available warnings/alarms:

- Power Failure
- High Supply Temperature
- Low Supply Temperature
- High Return Humidity
- Low Return Humidity
- Loss of Airflow
- Compressor Low Pressure
- Compressor High Pressure
- High Discharge Temperature
- Supply Sensor Failure
- High Water Level Alarm

Following features are incorporated into the controller:

- Status report of the latest 999 alarms history of the unit.
- Input for remote on-off and volt-free contacts for simple remote monitoring of low and high priority alarms: high/low temperature, high/low refrigerant pressure, fan/control failure, compressor/control failure, and others are available.
- The automatic restart option is also provided after a power failure.

2.6.2. Displays versions

The graphic screen display is a 7-inch color display with a three-level password protection to prevent unauthorized operation effectively. The operation timing of components are available through the menu options, it also provides tracked records of the temperature and humidity of the unit. An audible indication (buzzer) is also provided in case of the 'Warning' or 'Alarm' event. The screen displays the current temperature and humidity, unit output status such as: cooling, heating, dehumidifying, and humidifying; unit modes: single, lead, and standby; unit operation status: running, standby, and locked, alarm information, and current date & time.

2.6.3. Remote Shutdown Terminal

The remote shutdown terminal provides the user an option to remotely shut down the unit.

2.6.4. Common Alarm Contact

This provides the user with a set of normally open (n/o) contacts for remote indication of unit alarms. When a critical alarm occurs, the contact gets closed and sends an output signal to trigger the external alarm devices.

2.7. Monitoring

The control board is provided with an RS485 port with a MODBUS standard protocol. For monitoring by serial port, the RDU-SIC monitoring card is used which is equipped with an RJ45 port and an USB port. One RDU-SIC card can be installed per unit. Features of the RDU-SIC card include:

- Using the Web browser to monitor intelligent equipment and the environment through the Web server function.
- Using the network management system (NMS) to monitor intelligent equipment and the environment through the SNMP agent function.
- Using the machine room management software (RDU-Manager) to monitor intelligent equipment and the environment through the TCP/IP port.

2.8. Condenser

The condenser is provided with a fan speed controller (only for 22 & 27 kW) that is designed and set for using R410A refrigerant. The condenser operates at -15 °C to 45 °C ambient temperature. The condenser frame is made up of a sturdy aluminum structure, and the protection level of the outdoor unit is IPX4.

2.9 Electrical Re-heating

The Vertiv™ Liebert® DME units are provided with a Positive Temperature Coefficient (PTC) ceramic type electrical heater, with a temperature switch on the surface of the heater, and it automatically cuts off the power supply of the heater when the surface temperature is too high. The rated heating capacity of the electrical heater is up to 6 kW.

2.9. Optional Features

2.9.1. Humidifier

The Liebert DME can be provided with an infrared humidifier from the factory in the cooling unit. The humidifier consists of a remote infrared tube, a water injection valve, a humidifying water dish, a temperature protection device, and a water level device alarm. The humidifier also has the humidifying capacity up to 3 kg/hr.

2.9.2. Water Leakage Detection Kit

This kit is used to detect the water under floor and to send an alarm signal to the control board.

Technical Specification (Indoor Unit)

Parameters		Unit Model						
		DME07M**UA1	DME12M**UA1	DME17M*0UA1	DME22M*0UA1	DME22M*0FA1	DME27M*0UA1	DME27M*0FA1
Net Cooling Capacity/ Net Sensible Cooling Capacity	24 °C DB,50 %RH	7500	12500	17000	22000	22000	28100	28100
	& 35 °C Outdoor DB	6750	11250	15300	19800	19800	25300	25300
Evaporator Fan	Standard Airflow Rate (m³/h)	2000	3300	4300	6000	6300	7300	8100
	Number of Fan	1	1	1	1	1	1	1
	External Static Pressure (ESP) (Pa)	0	0	0	0	20	0	20
No of Compressor		1	1	1	1	1	1	1
Evaporator Coil	Surface Area (m²)	0.30	0.44	0.75	0.47*2	0.47*2	0.63*2	0.63*2
	Air Velocity (m/s)	1.85	1.88	1.58	1.77	1.86	1.61	1.79
Electric Heating (Optional)	Power (kW)	3	3	5.5	6	6	6	6
Humidifier (Optional Infrared or Electrode)	Humidification Capacity (kg/hr)	1.5	1.5	3	3	3	3	5
Connection Details	Liquid Pipe OD (mm)	9.5	12.7	12.7	16	16	16	16
	Discharge Pipe OD (mm)	12.7	16	16	19	19	19	19
	Humidification Inlet Pipe Joint	1/4" Copper nut 1/4" to 1/2" Conversion copper threaded joint						
	Drain Pipe OD (mm)	22	22	22	22	22	22	22
Operational Weight (kg)		85	125	230	253	248	283	290
Additional Amount of Standard Unit Refrigerant (kg)		2.5	3.2	5.2	8.1	7.5	9.4	9.0
Electrical Parameters	FLA (A)	15.2	23.3	28	35.9	35.9	36.5	36.5
	Recommended Circuit Breaker (A)	32	32	32	40	40	40	40

Technical Specification (Outdoor Unit)

Parameters	Unit Model				
	DMC07WA1	DMC12WA1	DMC17WA1	DMC22MA1	DMC27MA1
Air Volume (m ³ /h)	3800	6800	8200	10000	12500
Condenser Coil Surface Area (m ²)	0.71	1.70	1.38	1.77	2.07
No. of Condenser Coil Row	2	2	2	3	3
Motor Power (W)	160	320	450	480	500
Operating Temperature range (°C)	-15 °C to 45 °C (standard model) / -34 °C to 45 °C (with low temperature component)				
Liquid Pipe OD (mm)	9.7	12.7	12.7	16	16
Discharge Pipe OD (mm)	12.7	16	16	19	19

