

Lambda DX/DXU

DIRECT EXPANSION PRECISION AIR CONDITIONERS

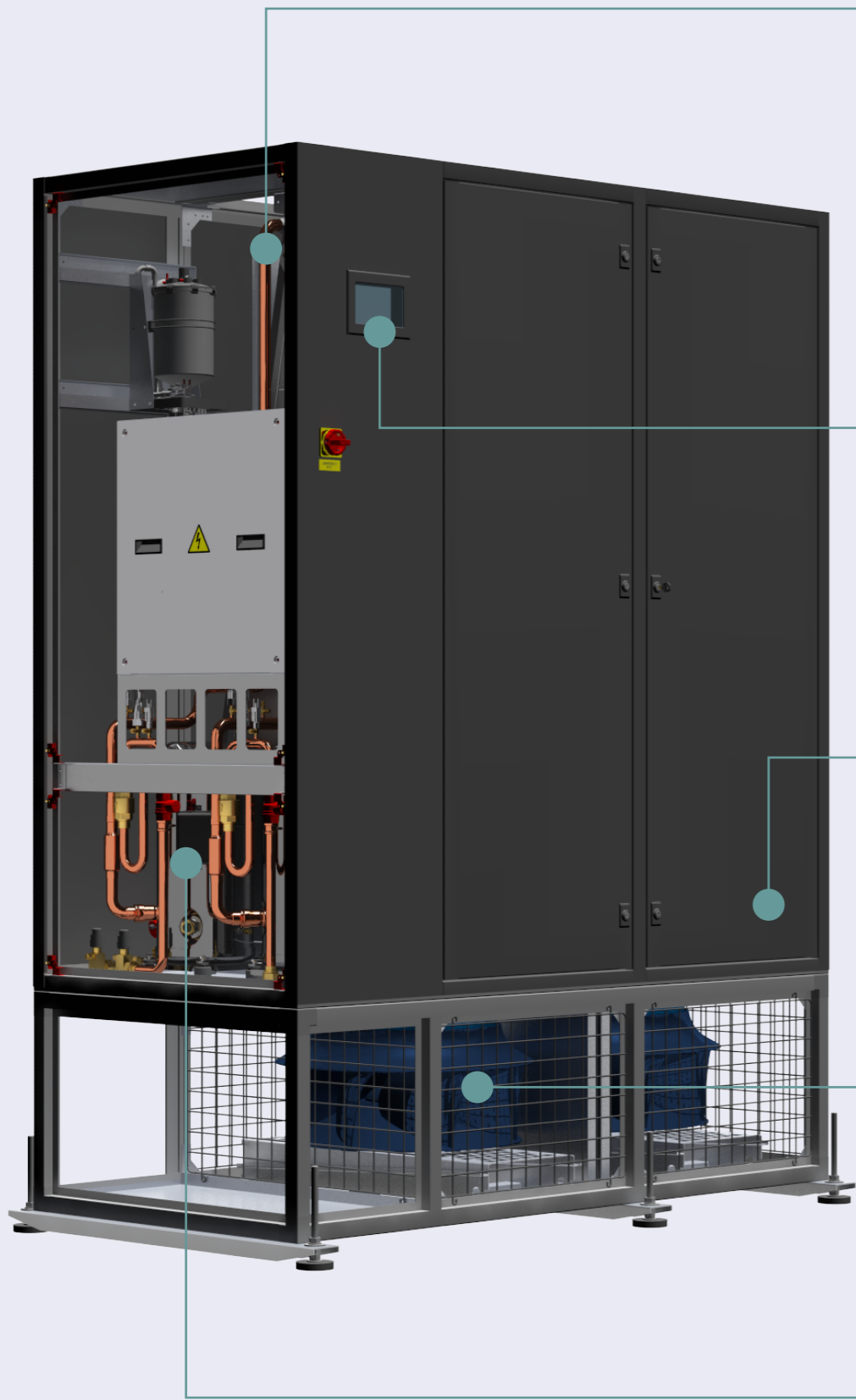
- ▶ HIGH ENERGY EFFICIENCY WITH EER UP TO 4.06
- ▶ DESIGNED FOR MISSION-CRITICAL APPLICATIONS
- ▶ DUAL REFRIGERATION CIRCUIT



35-95kW

DUAL REFRIGERATION CIRCUIT UNITS WITH SCROLL COMPRESSORS, BOTTOM OR UNDERFLOOR AIR DISCHARGE



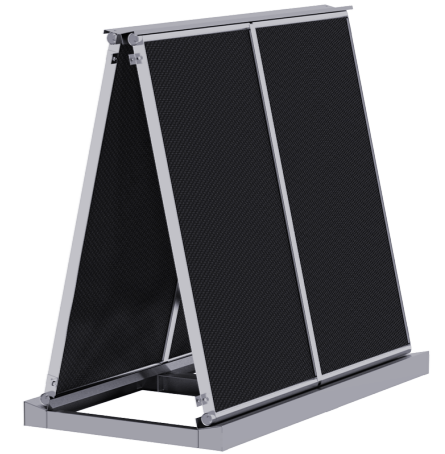


Heat exchangers

High performing microchannel evaporators combined in A-form

Lambda units based on newly developed all-aluminium microchannel heat exchangers with an advanced design that combines high-performance flat tubes, state-of-the-art airside fins, and low-pressure drop headers. The unique geometry of the manifolds and refrigerant distributors make it possible to feed the microchannel tubes equally for evaporation and ensures consistent and predictable heat transfer. Vertically-oriented microchannel tubes allow free condensate water shedding.

Lambda family of precision air conditioners takes the full advantage of microchannel evaporators and offer an ultimate energy efficiency not found in any other air conditioning systems. During the design process, special attention has been paid to air distribution on the coil surface. An accurate airflow analysis by CFD simulation has been performed to achieve the best possible aerodynamics, maximum airflow efficiency, and the lowest possible noise emissions level.



Controls

Centralized room thermal control

The control hub of Lambda DX/DXU is a sophisticated microprocessor with control logic specially developed for direct expansion air conditioners and refrigerant R410a. The customer can manage and optimize the unit's performance either locally or remotely. The software allows configuring multiple units simultaneously by replicating the configuration and parameters onto a group of networked units, thus reducing commissioning time. Users can apply various control strategies based on either continuous temperature control, or on-demand airflow control, or constant pressure control by maintaining a pressure differential between the cold and hot aisles.

Frame and assembly

Robust frame and lightweight, airtight enclosure

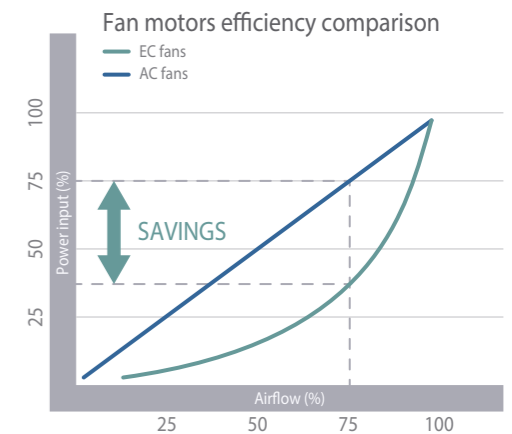
Extensive use of aluminium components in Lambda design makes the whole construction lightweight, yet durable. We paid special attention to Lambda's enclosure airtightness to prevent leaks and maximize airside efficiency. The assembly of Lambda units has been engineered with attention to specific data center infrastructure requirements, and as a result, Lambda units can be easily integrated into the data center whitespace. Detachable face panels allow easy and quick access to unit internals for check and maintenance procedures. Engineered from the ground up, Lambda units incorporate a modular design that requires 30% less parts, thus enabling short lead times and reduces final cost.



EC-motor fans

Highly efficient radial fans

New radial fans with unique blade geometry offer increased airflow with a reduced size and wide efficiency range, quiet operation and reduced weight. In combination with EC-motors with integrated control functionality, communication interface, and overtemperature protection, these fans provide unbeatable energy efficiency. Lambda DX/DXU features easily accessible fan compartment with noise insulation which makes it one of the quietest precision air conditioners on the market.



Refrigeration circuit

Perfectly suitable for running at full and part loads

Lambda DX/DXU precision air conditioning units feature two independent refrigerant circuits each connected to a dedicated evaporator, thus allowing the maintenance tasks to be carried out with the cooling system at power. Through the use of microchannel evaporators, the refrigerant charge of the Lambda DX/DXU air conditioners is significantly reduced in comparison to designs with finned tube heat exchangers. Each refrigerant circuit equipped with electronic expansion valve (EEV) which has the function of regulating and optimizing the refrigerant quantity to the evaporator according to current requirements. All the components of Lambda's refrigerant circuit are located within the separate compartment, allowing easy access for maintenance and servicing.



LAMBDA DX/DXU AIR CONDITIONING SYSTEM PROVIDES PRECISE AND RELIABLE CONTROL OF INDOOR TEMPERATURE, HUMIDITY, AND AIRFLOW FOR PROPER OPERATION OF COOLED FACILITIES. IN ADDITION TO THE WIDE RANGE OF OPTIONS, THIS GIVES OUR CUSTOMERS THE FLEXIBILITY TO DESIGN SOLUTIONS, MATCHING INCREASINGLY COMPLEX REQUIREMENTS AS CLOSELY AS POSSIBLE. COOLING SOLUTIONS BASED ON LAMBDA DX/DXU PROVIDE AN EXCELLENT BALANCE OF HIGH PREDICTABILITY, HIGH POWER DENSITY, ADAPTABILITY, AND THE BEST OVERALL TCO.

Scroll compressors

Proven reliability and performance

Lambda direct expansion air conditioners are based on scroll compressors which offer part-load efficiency and increased load-matching capabilities, as well as quiet operation and diagnostic capabilities, and enable two-stage capacity by running compressors individually or simultaneously.

Lambda's refrigerant side consists of two gas circuits, each equipped with electronic expansion valve (EEV) to ensure optimum system efficiency.



Package, options and accessories

| Description | | | |
|--|-------------------------------------|--|-------------------------------------|
| General | | | |
| Steam humidification system | <input type="checkbox"/> | Condensate discharge pump | <input type="checkbox"/> |
| Dehumidification system | <input type="checkbox"/> | Leakage detection | <input type="checkbox"/> |
| Multi-stage electric heater w/ thyristor control | <input type="checkbox"/> | Air intake plenum | <input type="checkbox"/> |
| Noise-reduction shells for compressors | <input type="checkbox"/> | Air discharge plenum | <input type="checkbox"/> |
| Refrigerant side | | | |
| Electronic expansion valves (EEVs) | <input checked="" type="checkbox"/> | E-coated heat exchangers | <input type="checkbox"/> |
| Solenoid valve on liquid line | <input type="checkbox"/> | Check valves on compressors discharge | <input checked="" type="checkbox"/> |
| Liquid receivers (loose) | <input type="checkbox"/> | Temperature probes on compressors suction/discharge | <input checked="" type="checkbox"/> |
| Filter-driers (loose for DXU models) | <input checked="" type="checkbox"/> | Pressure transmitters on compressors suction/discharge | <input checked="" type="checkbox"/> |
| Airside | | | |
| EC fans w/ Modbus connectivity | <input checked="" type="checkbox"/> | Temperature probes on air intake/discharge | <input checked="" type="checkbox"/> |
| Continuous temperature control | <input checked="" type="checkbox"/> | Humidity probes on air intake/discharge | <input type="checkbox"/> |
| Continuous pressure control | <input checked="" type="checkbox"/> | Smoke detection | <input type="checkbox"/> |
| Continuous airflow control | <input checked="" type="checkbox"/> | Fire detection | <input type="checkbox"/> |
| Electric and controls | | | |
| Touch screen HMI | <input checked="" type="checkbox"/> | BMS connectivity | <input checked="" type="checkbox"/> |
| Controller backup power supply | <input type="checkbox"/> | SNMP connectivity | <input checked="" type="checkbox"/> |
| Dual power supply w/ changeover switch | <input type="checkbox"/> | GSM connectivity | <input checked="" type="checkbox"/> |
| Soft-starter | <input type="checkbox"/> | Power factor capacitors | <input type="checkbox"/> |
| | | Thermal and noise insulation | <input checked="" type="checkbox"/> |
| | | Floor stand (DX models) | <input type="checkbox"/> |
| | | Motorized backdraft damper | <input type="checkbox"/> |
| | | Underfloor section blind paneling (DXU models) | <input type="checkbox"/> |
| | | Threaded connections | <input checked="" type="checkbox"/> |
| | | Grooved connections | <input type="checkbox"/> |
| | | Brazed connections | <input type="checkbox"/> |
| | | Refrigerant leakage detection | <input type="checkbox"/> |
| | | Temperature probe (loose) | <input type="checkbox"/> |
| | | Humidity probe (loose) | <input type="checkbox"/> |
| | | Grade G4 air filtration w/ filter change switch | <input checked="" type="checkbox"/> |
| | | Grade F7 air filtration w/ filter change switch | <input type="checkbox"/> |
| | | Phase monitoring relay | <input type="checkbox"/> |
| | | Energy manager | <input type="checkbox"/> |
| | | Remote monitoring software | <input checked="" type="checkbox"/> |
| | | Phase sequence control | <input type="checkbox"/> |

- Standard feature
- Optional feature

Model identification

Lambda

| Type | DX | U | 12 | - | H |
|---------------------------|----|---|----|---|---|
| Type | DX | | | | |
| Air discharge arrangement | | U | | | |
| Enclosure size | | | 12 | | |
| Steam humidifier | | | | - | H |

25% energy savings through the use of EEV

The electronic expansion valves (EEVs) used in Lambda DX/DXU design reduce the need for high head pressure when running at part load and lower ambient conditions. EEVs are controlled by a driver which regulates its opening according to the performance levels required by the system and guarantees the minimal overheating under all operating conditions.

Technical Specifications

| Lambda | | DX 09 | DX 12 | DX 15 | DX 18 | DXU 09 | DXU 12 | DXU 15 | DXU 18 |
|---|-------|-------|-------|-------|----------------------|--------|--------|--------|--------|
| Inlet air temperature/humidity: 24°C/45%; Ambient air temperature: 35°C | | | | | | | | | |
| Total cooling capacity | kW | 33.3 | 52.1 | 72.2 | 86.2 | 35.9 | 56.5 | 77.9 | 93.8 |
| Sensible cooling capacity | kW | 30.5 | 48.1 | 66.1 | 79.9 | 32.5 | 51.1 | 70.7 | 85.2 |
| Energy efficiency (EER) | kW/kW | 3.82 | 3.86 | 3.96 | 3.82 | 3.86 | 3.97 | 4.06 | 3.91 |
| Power input | kW | 4.8 | 7.6 | 10.2 | 12.5 | 5.0 | 7.8 | 10.5 | 13.1 |
| Compressors | | | | | Scroll compressors | | | | |
| Quantity | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Power input | kW | 3.97 | 5.92 | 8.07 | 10.01 | 4.34 | 6.39 | 8.70 | 10.91 |
| Fans | | | | | EC-motor radial fans | | | | |
| Quantity | | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 |
| Airflow | m³/h | 9000 | 14000 | 19500 | 24000 | 9000 | 14000 | 19500 | 24000 |
| External static pressure | Pa | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Power input | kW | 0.78 | 1.66 | 2.08 | 2.53 | 0.62 | 1.45 | 1.79 | 2.14 |
| Heat exchangers | | | | | MCHE | | | | |
| Quantity | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Refrigeration circuits | | | | | R410a | | | | |
| Quantity | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Dimensions | | | | | | | | | |
| Width | mm | 985 | 1285 | 1585 | 1885 | 985 | 1285 | 1585 | 1885 |
| Depth | mm | 920 | 920 | 920 | 920 | 920 | 920 | 920 | 920 |
| Height | mm | 2050 | 2050 | 2050 | 2050 | 1950 | 1950 | 1950 | 1950 |
| Underfloor height | mm | - | - | - | - | 530 | 530 | 530 | 530 |



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