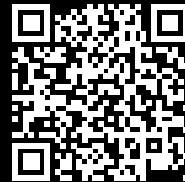


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## SK 3311.440 Liquid Cooling Package

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FRIEDHELM LOH GROUP



# SK 3311.440 - Liquid Cooling Package LCP Inline DX, LCP Inline DX/FC

Ideal for cooling of small and medium-sized IT applications.



## Features

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Model No.    | SK 3311.440                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Design       | LCP Inline DX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Benefits     | <p>Maximum energy efficiency due to EC fan technology and IT-based control</p> <p>Minimal pressure loss at the air end, which in turn minimises the power consumption of the fans</p> <p>Temperature monitoring and control</p> <p>With redundant temperature sensor integrated at the air end as standard</p> <p>Thanks to the speed-regulated compressor, the cooling output is ideally adapted to actual requirements</p> <p>Specific maintenance of the LCP DX due to separation of cooling and server racks</p> <p>Using LCP DX/FC variants in combination with indirect free cooling helps to save operating costs</p> |
| Applications | <p>Ideal for IT cooling of small and medium-sized locations</p> <p>One or two racks can be cooled separately</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

# Features

|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function principle                         | <p>The LCP is designed for siting within a bayed enclosure suite. Hot air is drawn in from the aisle at the rear of the device, cooled by the high-capacity compact impellers, and blown back into the room or cold aisle after cooling.</p> <p>The LCP DX/FC variants include both a refrigerant and a water/glycol heat exchanger. There is an additional free cooler integrated into the external condenser.</p> <p>Absorbed thermal energy is emitted to the ambient air at the external condenser location, without heating up the installation room</p> |
| Material                                   | Sheet steel, spray-finished                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Options                                    | <p>Humidifier</p> <p>Dehumidification and reheater</p> <p>Condensate drain pump</p> <p>Low-temperature/high-temperature condenser (-40 °C/+53 °C)</p>                                                                                                                                                                                                                                                                                                                                                                                                         |
| Design                                     | Suite cooling                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Monitoring                                 | <p>Direct connection of the unit via SNMP over Ethernet</p> <p>Integration into RiZone</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Note                                       | Variant with UL approval available on request                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Total cooling output to DIN EN 14511       | <p>Useful cooling output L22 L30: 12 kW</p> <p>Useful cooling output L22 L45: 10 kW</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Total cooling output/Number of fan modules | 12 kW/4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Modulation range                           | 3 - 12 kW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Air throughput (unimpeded air flow)        | At 50 Hz: 4,800 m³/h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Dimensions                                 | <p>Width: 300 mm</p> <p>Height: 2,000 mm</p> <p>Depth: 1,200 mm</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| To fit enclosure type                      | TS IT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Installation in bayed enclosure suite      | Flush                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Rated operating voltage                    | <p>380 V - 480 V, 3~, 60 Hz</p> <p>400 V, 3~, 50 Hz</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

# Features

|                                                   |                                                                                                                                                                                                    |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rated current max.                                | At 50 Hz: 7.5 A                                                                                                                                                                                    |
| Max. cooling output                               | 12 kW                                                                                                                                                                                              |
| Type of electrical connection                     | Connection clamp                                                                                                                                                                                   |
| Duty cycle                                        | 100 %                                                                                                                                                                                              |
| Cooling medium                                    | Refrigerant                                                                                                                                                                                        |
| EC fan                                            | Yes                                                                                                                                                                                                |
| Fans may be exchanged with the system operational | Yes                                                                                                                                                                                                |
| Temperature control                               | Linear fan control<br>Inverter-controlled compressor                                                                                                                                               |
| Pre-fuse                                          | Miniature circuit-breaker/fuse: 20 A                                                                                                                                                               |
| Storage temperature range                         | -20 °C...50 °C                                                                                                                                                                                     |
| Operating temperature range                       | 15 °C...35 °C                                                                                                                                                                                      |
| Noise level                                       | At 50 Hz: 69 dB(A)                                                                                                                                                                                 |
| Protection category to IEC 60 529                 | IP 20                                                                                                                                                                                              |
| Options                                           | Humidifier<br>Dehumidification and reheater<br>Condensate drain pump<br>Low-temperature/high-temperature condenser (-40 °C/+53 °C)                                                                 |
| Packs of                                          | 1 pc(s).                                                                                                                                                                                           |
| Net weight                                        | 208.5 kg                                                                                                                                                                                           |
| Gross weight                                      | 233.5 kg                                                                                                                                                                                           |
| Customs tariff number                             | 84186900                                                                                                                                                                                           |
| ETIM 9                                            | EC002515                                                                                                                                                                                           |
| ETIM 8                                            | EC002515                                                                                                                                                                                           |
| ECLASS 8.0                                        | 27180712                                                                                                                                                                                           |
| Product description                               | SK LCP Inline DX, Refrigerant-based split cooling unit for suite cooling, Mounted on the side of the rack, flush, Cooling of several racks, Support of IT-compatible, #front-to-back# air routing, |

# Approvals

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Certificates

EAC

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Explanations

Declaration of conformity

# Tender text

Tender text for LCP Inline DX, 3311.440 WHD (mm)  
300x2000x1200

LCP Inline DX:

IT-optimised design, providing ideal support for "front-to-back" air routing for the 482.6 mm (19") installations.

As a direct condenser, the integrated air/refrigerant heat exchanger guarantees a cooling output of up to 12 kW with standard server enclosure dimensions, the lowest possible weight, and comprehensive possibilities for monitoring.

The LCP Inline DX is mounted on the side of the rack. The warm server air is drawn in through a perforated rear door and the cooled air is blown back via a perforated door in front of the perforated doors of the server rack and is thus made available to the 482.6 mm (19") equipment once more.

The LCP Inline DX is closed up to the server rack at the front and rear and there forms a flush joint with the rack.

In its maximum configuration, the unit is equipped with four EC fans, for maximum efficiency and minimum power consumption.

The flow characteristics of the heat exchanger are optimised for the lowest possible pressure losses on the air side. This minimises the energy consumption of the fans.

An integrated inverter with corresponding controller serves to regulate the speed of the installed condenser.

This permits stepless adaptation of the output, also in partial-load operation, and by reducing energy consumption also achieves a reduction in operating costs.

Alongside the compressor, the cooling circuit of the LCP Inline DX comprises a collecting tank, liquid separator, electronic expansion valve, optimised heat exchanger, high and low-pressure sensors, Schrader valves, filter dryer, non-return valve, high-pressure switch and shut-off devices.

The refrigerant connections and the electrical power connection to the unit can be realised from above or below.

The system comprising LCP Inline DX and external condenser must be filled with refrigerant R410a after installation at the site.

The LCP Inline DX and the server rack remain separate from each other. This simplifies assembly and service work and excludes the need for unwanted access to the server rack for maintenance purposes.

Maintenance and service for all relevant components can be realised quickly and simply thanks to the optimised layout. The fans can be exchanged quickly and at any time, even while the system is operational (hot swapping).

The fans are installed in the cold air section, which increases their service life.

Condensate management is integrated into the unit. Any condensate is collected in a collecting tray in the base and from there discharged to the outside via a hose.

Thanks to the integrated controller, the LCP Inline DX operates fully autonomously.

The setpoint is the server intake air temperature, which is automatically held constant at the set value. Three sensors are present in each case for detection of the cold and warm air temperatures, providing for the appropriate redundancy.

Monitoring and alarm management for all physical parameters is realised via SNMP and Ethernet. To this end, the optional SNMP card is required.

A display with operating keys is integrated on the front of the unit to display and set the physical parameters.

The external condenser SK 3311.360 is needed to operate the LCP Inline DX.

Installation and commissioning on site, laying of the refrigerant pipes, and evacuation and filling of the system with refrigerant are not included in the scope of supply and must be realised by correspondingly qualified persons.

Technical specifications:

Useful cooling output: „12 kW at 30 °C ambient temperature at place of installation of the „„„„ condenser

10 kW at 45° C ambient temperature at place of installation of the condenser

The LCP DX is modulating it's cooling performance in a range between 3-12kW without interference.

Installed fans: 4

Air throughput: max.5.000 m<sup>3</sup>/h

Intake temperature, set: 22 °C

Connection, liquide side: 12 mm, external thread

Connection, gas intake side: 12 mm, external thread

Power supply: „400 V, 3~, N, PE, 50/ 60 Hz (voltage range 380-460 V)

Max. connected load: 4,700W

Refrigerant: R410a

Connection length, max.: 30 m

Height difference (condenser higher/lower), max: 20/3 m

Dimensions (WxHxD): 300x2000x1200mm

Weight: 180 kg

Colour: RAL 7035

Available installation space in adjoining server rack:

Unrestricted (standard: 42 U)

Accessories:

SNMP card for network connection: 3311.320

External condenser (needed to operate the LCP-DX):

3311.360 3311.360

Optional:

If necessary, a humidifier and/or heater can be integrated into the LCP Inline DX.

Please enquire for further details.