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## SK 3232.731

### Chillers for IT cooling

State: 31.07.2025. (Source: [rittal.com/hr-hr](https://www.rittal.com/hr-hr))

ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

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SOFTWARE & SERVICES

FRIEDHELM LOH GROUP



# SK 3232.731 - Chillers for IT cooling

Especially for cooling IT applications, such as LCP or air/water heat exchangers. Safety-relevant features such as redundant speed-controlled pumps, two compressors or buffer stores.

## Features

|                                |  |
|--------------------------------|--|
| Model No.                      | SK 3232.731  |
| Benefits                       | Indirect free cooling – internal and external<br>High-efficiency pumps in the cold water circuit<br>Inverter-controlled pumps<br>Two high-performance compressors<br>Up to 8 chillers may be linked together to form a cascade |
| Technical specifications       | Compact design with control components in the front and air intake via both side panels, air outlet upwards<br>Pressure-sealed system<br>Integral bypass   |
| Applications                   | Especially for cooling IT applications, such as LCP or CRAC  |
| Colour                         | RAL 7035   |
| Supply includes                | Chiller wired ready for connection<br>Multilingual documentation<br>Functional diagram and wiring plans  |
| Options                        | Free cooling may be integrated from 15 kW. Please follow the instructions<br>Buffer store for separate siting<br>Emergency cooling with mains water infeed   |
| Rated operating voltage        | 400 V, 3~, 50 Hz   |
| Rated current max.             | At 50 Hz: 46.5 A   |
| Tank                           | Material: Steel tank, with 10 mm condensate insulation<br>Volume: 100 l  |
| Cooling output (footnote)      | Cooling output makes allowance for 35% glycol  |
| Cooling output TW15 TU35/50 Hz | 48 kW  |
| Pump pressure                  | 2,5 bar  |

# Features

|   |   |
|---|---|
| Pump capacity (at 2.5 bar/50 Hz)              | 120 l/min   |
| Water connections                             | G 1½" internal thread   |
| Operating weight                              | 810 kg  |
| Number of cooling circuits                    | 1   |
| Monitoring                                    | Monitoring of all system-relevant parameters such as: water inlet, refrigerant and pump parameters and alarms, as well as optional cooling outputs and energy efficiency<br>Direct connection of the unit via SNMP/Modbus over Ethernet.<br>Integration into RiZone   |
| Note  | Technical deviations in terms of cooling output, dimensions or weight are possible for unit types with free cooling<br>The performance data for the chosen option package varies and should be taken from the IT chiller configurator. We reserve the right to make technical modifications<br>Pump and tank may be selected as options with IT chillers, the relevant technical specifications apply to these configuration variants |
| Air throughput (unimpeded air flow)           | At 50 Hz: 18,000 m³/h   |
| Dimensions                                    | Width: 1,000 mm<br>Height: 1,780 mm<br>Depth: 2,300 mm  |
| Operating temperature range of cooling medium | 5 °C...15 °C  |
| Operating temperature range                   | -20 °C...43 °C  |
| Permissible operating pressure (p. max.)      | 28 bar  |
| Power consumption Pel                         | At 50 Hz: 21 kW   |
| Packs of                                      | 1 pc(s).  |
| Customs tariff number                         | 84186900  |
| EAN   | 4028177687226   |
| ECLASS 8.0                                    | 27180713  |

# Approvals

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Explanations

Declaration of conformity

# Tender text

Cold water generation

Chiller in compact design

for recooling of circulation water, factory assembled, internally wired, provided with oil and refrigerant, pressure-tested.

Highly robust design thanks to redundant components.

Cooling unit especially designed for requirements in the IT field in conjunction with Rittal Liquid Cooling Package (LCP)

Consisting of:

Solid enclosure made of section plates with louvre plates on both sides as air inlet and transportation holes in the base/plinth.

Two compressors with suction cooled gas, fully hermetically sealed compressors mounted on vibration dampers with crank case heaters as "tandem (50 % - 50 %).

Evaporator as plate heat exchanger with stainless steel plates, copper soldered, diffusion tight insulation and electrical heating element.

High-performance condensor, air-cooled (copper pipe with aluminium fins), with two speed-controlled axial fans, air suction at the side, blowing out towards the top.

One refrigerant circuit of soft copper pipe, silver soldered, equipped with refrigerant collector, dryer, inspection glass, liquid magnetic valve and thermostatic expansion valve with MOP, service valves and blocking valves on the suction and pressure side of the compressors. High-pressure pressostats, Low-pressure pressostats in TÜV tested design.

Control integrated in a compact enclosure made of spray-finished sheet steel IP54 in RAL 7035 (Rittal or comparable design).

Enclosure and control unit accessible from the front and wired to VDE/IEC standard.

Micro-processor controller Carel PC05 electronic board with digital display and SNMP interface card for monitoring and controlling the complete unit.

5 floating contacts for collective fault signal,  
pumps, cooling circuit, excess temperature and filling  
pressure fallen below,  
24 V AC control voltage,  
red lamp "collective fault signal",  
remote control on/off,  
cable marking with marking systems,  
cable entry in the front panel,  
all motors with motor circuit breaker,  
electromagnetic consumer with RC circuit,  
main switch, red/yellow,  
flow monitor for pump and evaporator protection,  
sensor in water inlet and water outlet,  
antifreeze probe to protect evaporator,  
redundant connection of several units (max. 8) via  
master/slave control possible.

Interface to the building control system via Rittal  
CMC or SNMP interface possible.

Water circuit as pressure-sealed system with steel  
tank.

Two highly efficient inverter pumps with "Viton" seal  
in redundant design with switching to even  
utilisation,

blocking valve in front of and behind the pumps,  
non-return valve at the pump outlet,  
automatic bypass valve,

expansion tank, safety valve and exhaust fan,  
draining device and filling connection for water  
internal,

water connections in the rear panel,  
water pressure manometer 0 - 10 bar,  
water pressure monitoring via pressure transmitter in  
the water entry, piping and components completely  
isolated.

Fluid: Rittal Rifrost standard SK3301.960 for indoor  
use or outdoor SK3301.950 for outdoor use; as an  
alternative water according to the German standard in  
water quality with an additive of 20% to maximum 35% of  
Antifrogen N from Clariant. In general it is also  
possible to use other additives after prior arrangement  
with and approval of Rittal. An inappropriate fluid  
can lead to damages at the gaskets etc.

Enclosure: Industrial enclosure painted in RAL7035 with rubber anti-vibrating mounts, fixed below the unit.

We recommend outdoor siting with an additional rain roof as weather protection, special fencing and anchoring to the ground (not in our delivery part).

Transportation: to lift the chiller a forklift can be used or passing strong enough belts below the unit.

Documentation:

General description

Data sheet

Hydraulic scheme, Legend

Wiring plan

Controller description

Parameter list

Spare parts list

German and English language

CE Declaration of Conformity

Test protocol

Directive taken into account:

Machinery Directive 2006/42/EC

Low Voltage Directive 2006/95/EC

EMC Directive 2014/30/EC

Pressure Devices Directive 2014/68/EC

Technical specifications:

Cooling output at  $T_w=15^{\circ}\text{C}$ ,  $T_u=35^{\circ}$  48 kW Cooling

output at  $T_w=25^{\circ}\text{C}$ ,  $T_u=35^{\circ}$  54,3 kW Rated operating

voltage  $\pm 6\%$  400V / 50Hz / 3~ Control voltage

$\pm 10\%$ , 24 V AC / 50 Hz Power consumption at  $T_w=15^{\circ}\text{C}$ ,

$T_u=35^{\circ}$  21 kW Rated current max. 46.5 A Start-up

current 110 A Refrigerant, R407C Number of compressors

2 Capacity steps % 0-50-100% Number of axial fans 2

Pump capacity 120 l/min Pump pressure, external 2.5

bar Power consumption pump 1,5 kW Tank capacity 100 l

Temperature range  $+5^{\circ}\text{C}$  -  $+20^{\circ}\text{C}$  Ambient temperatures -

Operating conditions,  $-20^{\circ}\text{C}$  to  $+43^{\circ}\text{C}$  Ambient

temperatures - Transport, storage  $-20^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$

Dimensions with base/plinth (W x H x D),

1000 x 1780 x 2300 mm Base/plinth height, 100 mm

Water connections (internal thread), 1 1/2" Weight,

710 kg Air throughput of fans 18000 m<sup>3</sup>/h Sound

pressure level in a 10 m distance 53 dB(A)

Protection (Electric) IP 54 for all electrical components  
Material piping Copper, brass and piping  
Design: Rittal SK3232.731 or comparable  
Options:  
Hydraulic system kit I: 1 inverter pump  
Hydraulic system kit II: 2 inverter pumps  
Hydraulic system kit III: 1 standard pump  
Hydraulic system kit IV: 2 standard pumps  
High efficiency Free-Cooling kit: Free cooling external, change-over to free cooling at ambient temperature of 2K below the water inlet temperature;  
3-way-valve and controlling are integrated in the chiller, ambient sensor delivered loose (in the electrical cabinet) with 5m cable.  
Technical alteration with external free cooling:  
Cooling output in compressor operation at  $T_w=15^{\circ}\text{C}$ ,  $T_u=35^{\circ}\text{C}$  48 kW, Cooling output free cooler at  $T_w=15^{\circ}\text{C}$ ,  $T_u=10^{\circ}\text{C}$  46 kW, max. power consumption in free cooling operation 4,26 kW, max. current in free cooling operation 7,8 A, air flow direction (to be indicated) vertical or horizontal  
Buffer store of steel, insulated, for separate siting; volume 1000 l, Dimensions D x H = 890 x 2026 mm in accordance with data sheet;  
Supplied loose: Safety assembly and pressure compensating tank.  
Emergency cooling kit via mains water infeed: Plate heat exchanger with magnetic valve (24V AC) NC and pressure switch (on a floating contact) for integration into the return pipe (LCP). Installed in a separate housing  
Municipal water conditions:  
max.  $8^{\circ}\text{C}$ , min. 2.0 bar - max. 6 bar  
Special voltage 460V / 60Hz  
UPS kit: power infeed divided into two parts - for compressor and fan, and for control and pump for UPS connection, switching over by software. (Attention Must only be used in conjunction with speed-controlled pumps!)

RiZone efficiency monitoring kit: consisting of additional sensors to show the energy efficiency of the chiller, the datas are available by SNMP