Installation, operating and maintenance instructions

Active acoustic sail system

INDUSAIL SYSTEM

INDUSAIL PLUS (QUADRO)
INDUSAIL AIR
INDUSAIL SILENT

- Combines four aspects: acoustics, lighting, cooling and ventilation
- Draught-free ambient air flow pattern
- High light reflectance value
- Low sound power
- Stepless power regulation
- Energy-saving EC technology
- Highly effective sound absorption
1. EC declaration of conformity .................................................. 3
2. Safety ......................................................................................... 4
   2.1 Explanations of symbols and notes ....................................... 4
   2.2 Safety instructions .............................................................. 5
   2.3 Intended use ......................................................................... 6
3. Transport instructions, delivery and storage ......................... 7
   3.1 Transport instructions and delivery ...................................... 7
   3.2 Storage / inbound delivery .................................................. 7
   3.3 Disposal, environmental protection and recycling ............... 7
4. Function description ................................................................. 8
5. Technical data ............................................................................ 9
   5.1 Dimensions / technical drawings ........................................ 9
   5.2 Overview of technical data .................................................. 12
   5.3 Cooling capacity / sound power level / power consumption .... 13
   5.4 Application range / connection diagram .............................. 16
   5.5 Application options and control ......................................... 16
6. Installation information ............................................................. 17
   6.1 Unit suspension ................................................................. 17
   6.2 Electrical connection ......................................................... 21
   6.3 Water connection .............................................................. 22
   6.4 Installation test and commissioning ..................................... 23
7. Maintenance and repairs .......................................................... 24
   7.1 Maintenance intervals ....................................................... 25
   7.2 Regular technical maintenance work .................................. 26
   7.3 Repairs ................................................................................. 27
1. EC declaration of conformity

EC declaration of conformity

In line with Annex II Part 1, Section A of the Machinery Directive 2006/42/EC, dated 17/05/2006

We hereby declare that the machine designated below meets the relevant provisions of the EC Machinery Directive 2006/42/EC.

Manufacturer: Maschinenfabrik Gg. Kiefer GmbH
Luft- und Klimatechnik
Heilbronner Straße 380
70469 Stuttgart

Machine: Ventilation unit
Type: INDUSAIL SYSTEM (PLUS, PLUS QUADRO)

Relevant EC directives and regulations:
EC directive 2006/42/EC (Machinery Directive)
EC directive 2014/30/EU (EMC Directive)

Applicable European standards, in particular:
EN ISO 12100:2011-03; DIN EN ISO 13857:2008-06; DIN EN 61000-6-2:2016-05;
EN 61000-6-3:2011-09; DIN EN 60335-1:2015-10; DIN EN 349:2008-09

Other national standards, guidelines and technical specifications:
EN 82079-1
VDI 6022 Blatt 1:2017-01
AHU Guideline 03

Manufacturer’s signature

Clemens Kiefer
Managing director

i. A. Daniel Nack
Head of Development
Ventilation System Components

Stuttgart, 31.03.2017
Place, Date
Signature
Signature
2. Safety

Assembly, installation, maintenance and dismounting may only be carried out by trained personnel. It must be ensured that all such work is performed reliably and safely.

2.1 Explanations of symbols and notes

This symbol can be found in all occupational safety instructions in this operating manual where there is a danger to life and limb. These instructions must be observed and require that work be performed with utmost caution. Occupational safety instructions must be passed on to users. Apart from the instructions in this operating manual, the generally applicable safety and accident prevention regulations must also be observed.

topics in the operating manual which are particularly relevant and require special attention for reasons of safety and service life of the unit. Directives, regulations and instructions must be complied with here. Examples of such topics include damage to the unit or building services.

General mandatory action sign for occupational safety and accident prevention. Compliance is compulsory due to various residual risks. Examples include wearing protective gloves, protective goggles and safety helmets.

Risk of Overhead Hazard! Indicator of a risk due to an overhead hazard, which can result — for example during maintenance work — in personal injury, including death, and in material damage.

Risk Due to Hot Surfaces! Indicator of a danger due to hot surfaces which can cause burns.

Risk of Cuts! Here you will find special information, instructions and prohibitions designed to prevent personal injury from cuts on metal panels. Indicator of a danger due to sharp edges.

Risk of Falling Parts and Tools from work being carried out overhead.

Wear a safety helmet.

Danger due to Electric Current! Indicator of a risk of electric shock, which can result in personal injury, including death, and in material damage.
2. Safety

2.2 Safety instructions

Please read the following operating instructions carefully before commissioning the INDUSAIL SYSTEM! Failure to observe the instructions can endanger people and the environment, and void any potential claims. The unit meets all relevant safety regulations.

Installation, servicing, maintenance work and repairs may only be carried out by trained and qualified personnel. In the event of damage, parts of the unit in and on the housing may be live. In line with local safety regulations, only authorised people with appropriate training and qualifications are permitted to establish, disconnect and remove or change electrical connections. All safety instructions and mandatory action signs in the operating manual and on the unit must be observed. The access hatch on the side of the unit may only be opened for cleaning, maintenance or repairs after electrical isolation. The power connection and control voltage connection must be established in accordance with the wiring diagram. It is forbidden to operate the unit in a partially fitted or partially opened state, as earth connections may have been interrupted.

In continuous operation, the motor can heat up to approx. 70 °C. The motor must be left to cool sufficiently before it is touched.

Danger due to sharp edges!
Risk of cuts from sheet metal. Sharp-edged heat exchanger fins and housing parts.

Objects and dirt must not be allowed to enter the fan impeller. A damaged impeller and the ejection of objects by the impeller can endanger people and shorten the service life of the unit.
2. Safety

To protect the motor, the access hatch must not be opened during operation. The units and suspension brackets must not be subjected to any additional load, as they may not be strong enough for this. The acoustic sail acts as protection for the internal parts of the machine and may only be removed or folded down for maintenance purposes in accordance with the safety regulations. If any damage caused by liquids, mechanical effects, corrosion, fire or similar is detected, the unit may only be restarted after adequate inspection by appropriate technical personnel. If any damage is detected, a specialist technician must immediately isolate the unit from the power supply across all poles and shut off the water supply to the unit. If any damage or soiling is present, this must be reported immediately to the responsible department. This also applies to unusual operating noises and odours.

by:
• Incorrect use
• Failure to observe these instructions
• Installation and operation by untrained technical personnel
• Technical changes to/manipulation of the unit
• Failure to observe the maintenance intervals
• Use of non-approved spare parts

2.3 Intended use

The INDUSAIL PLUS (QUADRO) and INDUSAIL AIR ceiling fan coil systems are used for cooling indoor spaces. The unit is designed for non-condensing operation. Consequently, the cold water supply temperature must be selected depending on the temperature and humidity of the air drawn into the unit.

The INDUSAIL SYSTEM must not be used as a safety-related component or for performing any safety-relevant function.

Observe the permissible operating and environmental conditions specified in the Application range section (page 16).

All information contained in these operating and maintenance instructions is based on the currently applicable standards and regulations, as well as the latest engineering standards.

The manufacturer accepts no liability for damage caused

Prevent condensation!

Condensation can occur on the heat exchanger if the cold water temperature is below the dew point of the ambient air. The Kiefer INDUSAIL SYSTEM is not designed for condensing operation. Consequently, it must be ensured that the setting for the supply water temperature prevents it from falling below the dew point. If necessary, the water temperature must be modulated according to the room air humidity. The design engineer must take account of this as early as the project planning stage.

The following instructions must be observed:
• In the case of window ventilation or ventilation without dehumidification, outdoor air with high humidity can enter the room when the window is opened, causing the temperature to fall below the dew point of the air. It must be ensured that the central cold water controller induces a weather-dependent increase of the cold water supply temperature.
• It is important to ensure that water pipes and fittings are insulated.

Installation of an on-site dew point and condensation monitoring system is recommended for hygiene and safety reasons. It must be ensured that the temperature does not fall below the dew point at any time.
3. Transport instructions, delivery and storage

3.1 Transport instructions and delivery
The base units and acoustic sails are supplied separately in sturdy transport packaging or, more specifically, shrink-wrapped on one-way pallets, secured with plastic or metal bands.
The installation and/or control accessories are supplied in a separate cardboard box.

3.2 Storage / inbound delivery
The recipient at the delivery location must check the units for damage immediately on arrival. Any damage found must be recorded on the delivery note. The haulier and the relevant contractual partner must be notified immediately if any damage is discovered or any parts on the delivery note are missing. Subsequent complaints cannot be considered.

Packaged products must be transported and stored as follows:
- Fully protected from weather conditions and humidity/moisture, i.e. do not keep or store products outdoors
- Transport and store products in dry, dust-free ambient conditions
- Protect products from humidity/dampness
- Do not expose products to corrosive or aggressive media
- Protect products from direct sunlight
- Storage temperature: 5°C to 50°C

In order to prevent contamination of and damage to the unit, the packaging and protective film (if present) must not be removed until immediately before commissioning.

Note:
Moisture and temperature effects can cause the dimensions of the material to change. We recommend storing the cardboard boxes for 2 to 3 days in the room where they will be used, before proceeding further.

3.3 Disposal, environmental protection and recycling
All products are packaged carefully in environmentally friendly materials. The packaging material must be disposed of in accordance with local regulations.
INDUSAIL SYSTEM is a flexible acoustic sail with integral recirculating air cooling for ambient air conditioning, factoring in lighting technology. The recirculating air or mixed air is induced via highly inductive linear diffusers, with an optional fresh air intake to improve the ambient air quality. By combining active and inactive components, the requirements of different office concepts can be fulfilled, even in the event of future changes. If planned appropriately, modifications to the partition wall situation will have no effect on the arrangement of the ceiling elements.

INDUSAIL SYSTEM versions:

**INDUSAIL PLUS (QUADRO)**
The fan draws ambient air into the unit via a filter cell and channels it through the heat exchanger. The air is cooled by the cold water flowing within the heat exchanger. The cooled recirculating air is then introduced into the room from four sides, in a highly inductive, draught-free manner, through Kiefer air diffusers, type INDUL P18. The filter cell protects the internal components from soiling.

As an option, it is possible to feed preconditioned primary air into the sail via an air connection (DN 125). This primary air is used to maintain the intended minimum outdoor air flow rate (EN ISO 15251).

**INDUSAIL SILENT**
Acoustic-only sail, similar in appearance to the INDUSAIL PLUS (QUADRO). The acoustic sail is designed for sound absorption and light reflection, to improve the interior acoustics and serve as an extended design element.

**INDUSAIL AIR**
The INDUSAIL AIR functions as an acoustic sail with fresh air supply (no recirculating air). The discharge characteristics are identical to those of the INDUSAIL PLUS (QUADRO) and achieve the same level of comfort at high air change rates.

The design supply water temperature must be selected to ensure that no condensation forms during correct operation.

The air flow rate, sound power and caloric output are important considerations for the unit design.

The caloric output of the units is determined by the amount of water – controlled, for example, by a water valve – and the speed of fan rotation.

The fan speed is controlled by regulating an EC motor with a 0 to 10 V (DC) signal from a controller or the building management system.

The sound power of the unit is determined by the speed of fan rotation and the air flow rate.
5. Technical data

5.1. Technical drawing

INDUSAIL PLUS (QUADRO), 2-conductor system, water connection at the side

- Power supply terminal box
- Supply air connector NW 125
- Rubber grommet for cable duct
- INDUSAIL PLUS version with cover

Suspension points:
- Detail X
- Detail Y

Hinge detail:

*Slot to accommodate threaded installation rod.

*Cold water connection

Kiefer Klimatechnik
www.kieferklima.de

Acoustic Sail System INDUSAIL SYSTEM
Technical modifications reserved
INDUSAIL AIR

Suspension point spacing 875

Suspension point spacing 1148

Suspension point spacing 572
5. Technical data

INDUSAIL SILENT

Suspension point spacing 1148
M8 threaded rod for on-site suspension

Suspension point spacing 875

780 470 678 1148 572
5. Technical data

5.2 Overview technical information

Types INDUSAIL SYSTEM

<table>
<thead>
<tr>
<th>Dimensions of ceiling fan coil unit</th>
<th>Operating range as indoor unit °C</th>
<th>INDUSAIL PLUS (QUADRO)</th>
<th>INDUSAIL AIR</th>
<th>INDUSAIL SILENT</th>
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<tbody>
<tr>
<td>Height mm</td>
<td>+ 5 up to + 40</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Width mm</td>
<td>+ 5 up to + 40</td>
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<td>Length mm</td>
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<tr>
<td>Socket diameter mm DN 125</td>
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<tr>
<th>Supply air box</th>
<th>Filter cell (EN 779)</th>
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<td>Length mm</td>
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<tr>
<td>Socket diameter mm 2 x DN 160</td>
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<td>2 x DN 160</td>
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<table>
<thead>
<tr>
<th>Recirculating air</th>
<th>Centrally prepared fresh air flow rate m³/h</th>
<th>0 – 120</th>
<th>0 – 500</th>
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<th>Heat transfer – water as operating medium</th>
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<td>Nominal water flow rate kg/h</td>
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<tr>
<td>Nominal pressure drop kPa</td>
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<td>-</td>
<td>-</td>
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<tr>
<td>Supply/return water connection pipe Inch</td>
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<th>Electrical system</th>
<th>Mains connection V / Hz</th>
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<td>IP rating (motor / electronics)</td>
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<td>IP 44 / 20</td>
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<tr>
<td>Fan power consumption at 10 V / 6 V Watt</td>
<td>45 / 22</td>
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</table>

<table>
<thead>
<tr>
<th>Acoustic sail</th>
<th>Height / Width / Length mm</th>
<th>INDUSAIL PLUS (QUADRO) 50 / 1100 / 2500</th>
<th>INDUSAIL AIR B1</th>
<th>INDUSAIL SILENT B1</th>
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<td>Building material class to DIN 4102 B1</td>
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<td>Light reflectance value % &gt; 90</td>
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<td>&gt; 90</td>
<td>&gt; 90</td>
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<tr>
<td>Sound absorption class (DIN EN ISO 354, DIN EN ISO 11654) C A</td>
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<td>C</td>
<td>A</td>
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</table>

| Total weight in operation | kg | 60 | 36 | 16 |
| Total height* mm | 255 | 250 | 50 |

* Excluding suspension
5. Technical data / detailed description

### 5.3.1 INDUSAIL PLUS (QUADRO)

<table>
<thead>
<tr>
<th>Mass flow [kg/h]</th>
<th>50</th>
<th>100</th>
<th>150</th>
<th>200</th>
<th>250</th>
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<td>∆p Water [kPa]</td>
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<td>7</td>
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<tr>
<td>2.0</td>
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<td>518</td>
<td>852</td>
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<td>1289</td>
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Fresh Air Flow Rate: 0 m$^3$/h

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<td>586</td>
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Fresh Air Flow Rate: 50 m$^3$/h

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Fresh Air Flow Rate: 80 m$^3$/h
5. Technical data

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<td>$\Delta p_{\text{water}}$ [kPa]</td>
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**Fresh Air Flow Rate: 100 m$^3$/h**

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<td>1635</td>
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**Fresh Air Flow Rate: 120 m$^3$/h**

* The values apply to the unit at a supply water temperature of 16 °C, a supply air temperature (fresh air) of 16 °C and an intake temperature of 26 °C (this value can differ from the ambient air temperature) in non-condensing operation.

$U$ – Control voltage (DC)
$Q_k$ – Total cooling capacity
$L_{WA}$ – A-sound power level ($\pm$3 dB(A))
$P_{\text{el}}$ – Fan power consumption

The cooling capacity largely depends on:
- the selected fan voltage
- the ambient air temperature
- The cold water supply temperature and the cold water mass flow rate

Secondary cooling capacity as a function of the water flow rate; see graph to the right.

The caloric performance data was determined on a performance test rig in the company’s own laboratory. The data applies under the following conditions:
- Stationary state during measurements
- No heat exchanger condensation
- Cold water without additives
- Assumed specific thermal capacity of the water of 4.19 kJ/kgK
5. Technical data / detailed description

### 5.3.2 INDUSAIL AIR

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>25</td>
<td>833</td>
<td>10</td>
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<tr>
<td>275</td>
<td>28</td>
<td>917</td>
<td>12</td>
</tr>
<tr>
<td>300</td>
<td>30</td>
<td>1000</td>
<td>14</td>
</tr>
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<td>325</td>
<td>33</td>
<td>1083</td>
<td>16</td>
</tr>
<tr>
<td>350</td>
<td>35</td>
<td>1167</td>
<td>18</td>
</tr>
<tr>
<td>375</td>
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<td>1250</td>
<td>21</td>
</tr>
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<td>39</td>
<td>1333</td>
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<td>41</td>
<td>1417</td>
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<td>450</td>
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<td>1500</td>
<td>29</td>
</tr>
<tr>
<td>475</td>
<td>44</td>
<td>1583</td>
<td>32</td>
</tr>
<tr>
<td>500</td>
<td>46</td>
<td>1667</td>
<td>35</td>
</tr>
</tbody>
</table>

The values apply at a supply air temperature of 16°C and an ambient air temperature of 26°C.

**Qk** — Cooling capacity total

**LWA** — A-Sound power level(± 3dB(A))

**Vol. Flow V** — Recirculating air flow

**ΔP** — Pressure loss

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**Sound power level LWA INDUSAIL AIR**

**Pressure loss INDUSAIL AIR**
Acoustic sail BG 2500 mm x 1100 mm
5. Application options and control

Application options: ventilation and conditioning of the ambient air using INDUSAIL PLUS (QUADRO) by secondary air intake from the room. The ambient air is cooled with a cooler connected to a cooling water circuit. Control with variable volume flow rates and output regulation by a cooling valve on the water side: a fan-coil controller (for example Siemens RDG 160T) captures the ambient temperature using a sensor integrated in the room thermostat and brings the room temperature to its set value by activating the water valve and the fan via a continuous control output (0-10 VDC). The controller and INDUSAIL PLUS (QUADRO) adjust the air flow rate and cooling capacity to meet the current requirements. This allows energy costs to be minimised, while maximising comfort.

Important: always ensure that the unit is used as intended in non-condensing operating mode. Failure to observe this requirement can result in damage to the unit and cause hygiene hazards to occur!

Maschinenfabrik Gg. Kiefer GmbH accepts no liability for damage resulting from use other than that intended. Deviating operating conditions require written approval from the manufacturer.

5.4 Application range

Operation in dry, interior rooms at ambient air temperatures of 5 to 40°C (non-condensing). The unit has been designed for use in locations where air qualities typical of offices prevail in terms of dust levels and corrosive/oily constituents.

If a room thermostat is used (for example Siemens type RDG160T):

- The controller and actuators are wired and configured on site (you receive a proposal for parameterisation of the room thermostat from your Kiefer contact).
- The coolant can be regulated using a water valve, including a continuous actuator. The actuator (0-10 VDC) is controlled by the room controller. The controller and actuator are wired on site.

If a continuous actuator is not required, we recommend that no coolant flows through the heat exchanger when the fan is idle. For this reason, we recommend a shut-off valve.

The controller must ensure that the coolant supply is shut off when the unit is not running.

Example of control diagram

- Y: "Cooling valve" control command
- n: Fan speed
- P: Proportional "cooling" zone
- Vent_max: Max. fan speed
- Vent_min: Min. fan speed
- Vent_on: Fan start point
6. Installation information

6.1 Unit suspension – INDUSAIL PLUS (QUADRO), SILENT and AIR

**INDUSAIL PLUS (QUADRO)**
- Raw concrete ceiling
- Suspended using steel expansion plug and M8 threaded bolt

**INDUSAIL SILENT**
- Raw concrete ceiling
- Suspended using steel expansion plug and M8 threaded bolt

**INDUSAIL AIR**
- Raw concrete ceiling
- Suspended using steel expansion plug and M8 threaded bolt

Installation dimension:
- ≥ 260 mm
- ≥ 100 mm
6. Installation information

**Installation information, unit suspension and installation**

- The property class of bolts, nuts, threaded rods and similar must be considered when selecting the installation components. The necessary size of threaded rods is M8. Four threaded rods must be attached at the indicated positions. The fixing parts are not included in the standard delivery.

- Observe the installation sequence. The base unit must be installed first, followed by the acoustic sail. Due to the risk of contamination, the acoustic sail must be fitted in the final step. The acoustic sail may only be handled when wearing clean, white gloves.

- The unit must be fitted in such a way as to be freely suspended and tension-free, with the possibility to compensate for thermally induced changes in size. The transmission of vibration and structure-borne noise to the building structure must be prevented, as this can lead to acoustic problems.

- The installed unit must not be used as a supporting element for other installations.

- The unit may only be installed and commissioned in a clean, dust-free, dry environment.

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**Risk of falling parts and tools from work being carried out overhead.**

Risk from falling parts!

The threaded rods must be fitted securely. Nuts and locking rings must be tightened firmly. The threaded rods must not be bent or distorted in any way.

---

**Danger due to electric current!**

Isolate the unit from the power supply before carrying out any work. Ensure that the unit is secured against reconnection at a suitable point in the area of the on-site power supply.

---

**Danger due to rotating parts!**

Isolate the unit from the power supply before carrying out any work.
6. Installation information

Installing the ceiling fan coil unit:
1. Remove the left and right-hand side covers of the ceiling fan coil unit.
2. Insert M8 threaded rods into the four slots on top of the ceiling fan coil unit and secure them with plain washers and M8 nuts.
3. Remove the protective film from the bottom of the ceiling fan coil unit after mounting on the ceiling and before installing the acoustic sail.

Fitting the acoustic sail to the ceiling fan coil unit:
1. Remove the supplied hexagon nuts (4x) and plain washers (4x) on the fitting side (sheet metal side) of the acoustic sail after opening the transport packaging.

In order to prevent soiling of the white acoustic mat, the acoustic sail may only be handled and touched at the outer frame profile during and after removal. Failure to observe this requirement can result in damage to or soiling of the acoustic fleece.

2. Remove the acoustic sail carefully from the packaging.
3. Raise the acoustic sail using a lifting device and align it with the ceiling fan coil unit as specified in the technical drawing in section 5.1.1. The cut-out sections in the cover panel of the acoustic sail must be situated below the respective openings of the fan and the supply air connector.
4. Insert the four M8 bolts of the acoustic sail into the slots in the frame profiles and the two hinges, then secure them with plain washers and M8 nuts. The nuts must be tightened such that no air gap is visible between the ceiling fan coil unit and the acoustic sail.
5. The two hinges can be aligned and adjusted to reduce the size of the gap. The M8 nuts must be loosened slightly for this purpose.
6. Installation information

6.2 Electrical connection

- The unit is intended for permanent connection to fixed lines.
- The INDUSAIL SYSTEM ceiling fan coil unit must be safeguarded with a circuit breaker, tripping characteristic "C", for the switch-on process.
- With a control signal of 10 V, the maximum power consumption of each unit during operation is 45 W.
- The cables used for switching the EC motor must be shielded.

Electrical wiring / terminal box

<table>
<thead>
<tr>
<th>Internal connections</th>
<th>Designation</th>
<th>Colour</th>
<th>Function / assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1</td>
<td>PE</td>
<td>green/yellow</td>
<td>Earth conductor</td>
</tr>
<tr>
<td>10.2</td>
<td>L</td>
<td>black</td>
<td>Voltage supply: 230 VAC, 50-60 Hz; see type plate for voltage range</td>
</tr>
<tr>
<td>10.3</td>
<td>N</td>
<td>blue</td>
<td>Neutral conductor</td>
</tr>
<tr>
<td>11.1</td>
<td>10 V/max. 1.1 mA</td>
<td>red</td>
<td>Voltage output: 10 V, 1.1 mA, galvanically isolated, not short-circuit proof</td>
</tr>
<tr>
<td>11.2</td>
<td>Tacho</td>
<td>white</td>
<td>Speed output: Open Collector, 1 pulse per revolution, galv. isolated, Isink max = 10 mA</td>
</tr>
<tr>
<td>11.3</td>
<td>0-10V PWM</td>
<td>yellow</td>
<td>Control input: 0-10 V or PWM, galvanically isolated</td>
</tr>
<tr>
<td>11.4</td>
<td>GND</td>
<td>blue</td>
<td>Earth connection of the control interface</td>
</tr>
</tbody>
</table>

Fan / motor

Kiefer Klimatechnik
www.kieferklima.de
Acoustic Sail System INDUSAIL SYSTEM
Technical modifications reserved
6. Installation information

The unit must be connected to a power supply across all poles! It must be possible to isolate the units from the power supply. All work must be carried out in accordance with national requirements and safety regulations. Wiring, fusing and earthing of the fan must comply with local regulations.

Working on live electrical equipment of the unit is not permissible. Operating the unit when open or dismantled is not permissible.

Connection to the grid is carried out on site according to the enclosed wiring diagram and may only be conducted by technical personnel.

6.3 Water connection

The hoses and connections of the heat exchanger must be checked for damage before connecting it to the water network.

Work may only be carried out on water connections when the unit is isolated from the power supply. After proper connection and before water is introduced, the connecting points must be tested for leaks.

Please note: Before water is routed into the unit, it is essential to check the flexible water connection hoses for a correct and tight fit.

Sharp-edged heat exchanger fins and housing parts.
6. Installation information

6.4 Installation test and commissioning

The test run and operation are only permissible following correct installation in compliance with all safety regulations and installation information.

**Risk from falling parts!**
The threaded rods must be fitted securely. Nuts and locking rings must be tightened firmly. The threaded rods must not be bent or distorted in any way.

Even after the unit has been properly installed, it must still be checked for various faults.

Requirements for commissioning:

- The unit must be inspected to verify that it is correctly mounted on the ceiling. This includes checking all threaded connections, such as threaded rods, nuts and locking rings. Threaded rods must not be damaged or soiled in any way.
- The media connections must be securely fastened.
- The connections must not exhibit any mechanical damage or leaks. The connections must be tested for leaks before commissioning.
- All electrical connections must be established based on the enclosed wiring diagram (page 19).
- The filter cells are attached to the unit and do not exhibit any soiling or damage.
- The mains voltage, control voltage and frequency must comply with the specifications on the type plate.
- The starting voltage for the fan must be sufficient.
- The discharge profile must not be blocked.
- The unit as a whole must be installed horizontally.
- The media connections must be laid in such a way as to be tension-free and sufficiently long.
- The supply media must be available in sufficient quantities on site.
7. Maintenance and repairs

Note!
A distinction is made between different qualification levels in the maintenance and cleaning work specified below. Technical maintenance work on the unit may only be carried out by appropriately qualified and trained technical personnel. Cleaning work may be carried out by trained cleaning personnel if all safety measures and precautions are assured by technical personnel with appropriate qualifications. Local and company safety regulations must be observed, together with the specifications in this operating manual, when carrying out any work on the unit and in its vicinity.

Danger due to electric current!
Isolate the unit from the power supply before carrying out any work. Ensure that the unit is secured against reconnection at a suitable point in the area of the on-site power supply.

Danger due to rotating parts!
There is a risk of injury from the rotating fan impellers. Isolate the unit from the power supply before carrying out any work. Ensure that the unit is secured against reconnection at a suitable point in the area of the on-site power supply.
7. Maintenance and repairs

7.1 Maintenance intervals
The maintenance intervals specified below are scheduled as per VDI 6022. The maintenance interval must be shortened if the level of soiling is particularly high.

<table>
<thead>
<tr>
<th>Performed by</th>
<th>No.</th>
<th>Task</th>
<th>Action if required</th>
<th>Interval – no. of months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trained cleaning</td>
<td>A</td>
<td>Spot-check units for soiling</td>
<td>Clean and repair unit (housing, front plate, fan)</td>
<td>x</td>
</tr>
<tr>
<td>personnel</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Change filter</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>Clean heat exchanger</td>
<td>Clean and repair</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>Spot-check all other components through which secondary air flows</td>
<td>Clean and repair</td>
<td>x</td>
</tr>
<tr>
<td>Qualified personnel</td>
<td>E</td>
<td>Hygiene inspection</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>Check unit for damage and corrosion</td>
<td>Clean or replace</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>Check fan for soiling, damage and corrosion</td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>
7. Maintenance and repairs

7.2 Technical maintenance

Regular technical maintenance work

The following technical and hygienic maintenance work must be carried out by trained cleaning personnel or qualified technical personnel.

Filter cell (G4)
The filter cell must be replaced at regular intervals – at least every 12 months. The cell is replaced by hand from the side of the unit. The filter cell is available as a spare part. If filter media from other manufacturers are used, reductions in caloric output and increases in sound power may occur.

In line with VDI 6022, the unit sections through which air flows are easy to clean. The fan and heat exchanger are serviced in this case by pivoting open the acoustic sail. To do this, the side cover is removed and the wing nuts loosened. The element can then be pivoted down.

Overhead hazard!
A risk of personal injury and damage to equipment directly below the sail may occur when pivoting open the acoustic sail. Consequently, a safety area extending one metre to the sides of the unit and 1.2 m below the unit must be cleared before maintenance. The acoustic sail must be pivoted open by hand. Clean, white gloves must be worn when carrying out all work, in order not to contaminate or damage the sail.

Filter cell (G4)
The filter cell must be replaced at regular intervals – at least every 12 months. The cell is replaced by hand from the side of the unit. The filter cell is available as a spare part. If filter media from other manufacturers are used, reductions in caloric output and increases in sound power may occur.

Pivoting open the acoustic sail

In line with VDI 6022, the unit sections through which air flows are easy to clean. The fan and heat exchanger are serviced in this case by pivoting open the acoustic sail. To do this, the side cover is removed and the wing nuts loosened. The element can then be pivoted down.

Overhead hazard!
A risk of personal injury and damage to equipment directly below the sail may occur when pivoting open the acoustic sail. Consequently, a safety area extending one metre to the sides of the unit and 1.2 m below the unit must be cleared before maintenance. The acoustic sail must be pivoted open by hand. Clean, white gloves must be worn when carrying out all work, in order not to contaminate or damage the sail.
7. Maintenance and repairs

7.3 Repairs

Replacement and repairs may only be performed by authorised personnel. We recommend that you contact our customer service department before replacing individual defective or damaged components.

If any damage is detected on the housing or other supporting components, the defective unit must be replaced completely. The unit must be isolated from the power supply across all poles for this purpose.

In the event of any other damage to wearing parts, the relevant part must be replaced independently in accordance with the maintenance instructions.

Heat exchanger

The secondary air drawn in is filtered before flowing through the heat exchanger, so no significant soiling should occur if the filter fleece is changed regularly. Clean the heat exchanger carefully with a brush if it still becomes soiled. Ensure that the aluminium fins are not bent out of shape during cleaning!

Fan

The fan is maintenance-free. If you nonetheless detect any soiling of the fan impeller surface during the visual inspection, you can wipe it with a damp cloth. The fan must be replaced in the event of damage.
Product range

Components
Linear, wall, ceiling, and displacement outlets, chilled ceilings, ceiling fan coolers, transfer elements, concrete core cooling with air. Axial and radial ventilators, hot-gas ventilators, plastic ventilators.

Systems
Air conditioning systems of all types for comfort (offices, administration buildings, department stores, hospitals, libraries, museums, etc.) and industrial purposes (mechanical engineering, high technology, textile, plastics, chemical, automobile, drinks, foodstuffs and other industries).

Services

Advice and Planning
Wir Wir will advise you in all questions concerning the application of our systems, carry out system investigations, and prepare cost estimates including calculation of cooling loads, piping networks, energy costs, and operating efficiency. Preparation of structure proposals for air distribution, lighting, ceiling systems. Illumination calculations using the latest software tools. Design and implementation of control concepts in our own instrumentation and control department. We incorporate our knowledge and experience in product innovations and new projects.

Air-conditioning laboratory

Comfort measurements on site to assess thermal comfort and room air quality.

Maintenance and Service
Maintenance service contracts for all types of ventilation and air-conditioning systems.

The Climate Specialist

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With release of this publication, all earlier versions lose their validity.