Active chilled beams for heating and cooling with 2- or 4-pipe heat exchangers for installation in ceiling bulkheads, e.g. in hotel rooms and hospital wards in the nominal lengths of 1000, 1125 and 1250 mm

- Preferably for room heights up to 4.00 m
- High heating and cooling capacity with a low conditioned primary air volume flow rate and low sound power level
- Media supply on the reverse or from the corridor side
- Compact device dimensions oriented to the basic dimensions and 2 different widths or depths for the heat exchanger to cover different output ranges
- Fixing points for various types of suspension systems/points
- Combination with different control systems, e.g. X-AIRCONTROL or control air-water systems possible

Optional equipment and accessories

- Integrated volume flow controller
- Standard grilles from the TROX grill range
- Various water connections, smooth CU tube, external thread G1/2" and flat seal or union nut G1/2" and flat seal
- The supply air spigot is extendable to compensate for structural tolerances

TYPE DID-E2

Active chilled beams with one way air discharge as a quiet alternative to fan coil units with two horizontal heat exchangers variants for different output ranges

Application

- Active chilled beams of Type DID-E2 for installation into ceiling bulkheads, preferably for room heights of up to 4.00 m
- Especially for hotel rooms and hospital wards
- Load removal with water enables a reduction of the primary air flow rate to the required minimum fresh air flow rate
2-pipe or 4-pipe heat exchangers enable good comfort levels with a low conditioned primary air volume flow rate

Energy-efficient solution since water is used for heating and cooling

Special features

- One-way air discharge
- Horizontal heat exchanger as 2-pipe or 4-pipe system
- The connection points are at the back of the unit, which is typically connected from the corridor
- The supply air spigot is extendable to compensate for structural tolerances
- Nominal sizes are based on the basic dimensions
- Integral volume flow controller as an option

Nominal sizes

- 1000, 1125, 1250 mm

DESCRIPTION

Variants

Water connection

- Position right (-R) or left (-L)
- Smooth copper tube Ø12 mm
- A1: external thread ½" with flat seal
- A2: union nut ½" with flat seal

Heat exchanger

- 2: 2-pipe systems
- 4: 4-pipe systems

Nozzle variants

- HE: small
- S1: medium
- S2: large
- HP: extra large
- H2: nozzle mix (50 % S2 nozzle and 50 % HP nozzle)

Other nozzle mixes possible on request.

Attachments

- VC: Integrated flow rate control subassembly

Accessories

- Z: Extension spigot for the supply air (if a supply air grille with concealed screw fixing is used, the extension spigot for supply air is essential)
- ERS: Installation subframe for secondary air grille

Useful additions

- Connecting hoses, type FS
- LWS control equipment consisting of a control panel with integral room temperature sensor including controller, valves and valve actuators; and lockshields
- Grille for supply air and secondary air from the TROX grill range
- Control system X-AIRCONTROL for water-side and air-side control with the option of a connection to the central BMS
For further information on the X-AIRCONTROL and for information relevant to design, please refer to the installation and operating manual.

**Construction features**
- Spigot is suitable for circular ducts to EN 1506 or EN 13180
- 5 nozzle variants for needs-based, optimum induction
- Side-mounted bracket for attachment with various mounting systems
- A mixture of nozzles is possible
- Devices without flow rate control subassembly have a central primary air connection, devices with a flow rate subassembly have a primary air connection on the left or right

**Materials and surfaces**
- Casing, nozzle plate, supply air spigot and installation subframe for secondary air grille made of galvanised sheet steel
- Heat exchanger with copper tubes and aluminium fins
- Surface of the casing and heat exchanger optionally available in black (RAL 9005)

**Standards and guidelines**
- Products are certified by Eurovent (no. 09.12.432) and listed on the Eurovent website
- Declaration of hygiene conformity to VDI 6022
- Sound power level of the air-regenerated noise measured according to EN ISO 5135

**Maintenance**
- Variants without flow rate control subassembly (VC) are low-maintenance, as there are no moving parts. The flow rate control subassembly can be accessed via a separate casing cover for maintenance purposes
- The heat exchanger can be vacuumed with an industrial vacuum cleaner if necessary
- VDI 6022, Part 1, applies (hygiene requirements for ventilation and air conditioning systems)

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**TECHNICAL INFORMATION**

Function, Technical data, Quick sizing, Specification text, Order code, Related products

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**Functional description**

Active chilled beams provide centrally conditioned primary air (fresh air) to the room and use heat exchangers for additional cooling and/or heating.

The primary air is discharged through nozzles into the mixing chamber; as a result of this, secondary air (room air) is induced via the induced air grille and passes through the horizontal heat exchanger.

Primary and secondary airflows mix and are then supplied to the room horizontally through the supply air grille.

**Schematic illustration of DID-E2**
Principle of operation DID-E2

① Conditioned fresh air (primary air)
② Supply air
③ Room air (secondary air)
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal length</td>
<td>1000, 1125, 1250 mm</td>
</tr>
<tr>
<td>Length</td>
<td>1000, 1125, 1250 mm</td>
</tr>
<tr>
<td>Width</td>
<td>519, 616, 711, 808 mm</td>
</tr>
<tr>
<td>Height</td>
<td>207, 212 mm</td>
</tr>
<tr>
<td>Primary air spigot, diameter</td>
<td>123, 158 mm</td>
</tr>
<tr>
<td>Primary air volume flow rate</td>
<td>8 – 57 l/s or 29 – 205 m³/h</td>
</tr>
<tr>
<td>Cooling capacity</td>
<td>Up to 1600 W</td>
</tr>
<tr>
<td>Heating capacity</td>
<td>Up to 1000 W</td>
</tr>
<tr>
<td>Max. operating pressure, water side</td>
<td>10 bar (in combination with connection hoses 6 bar)</td>
</tr>
<tr>
<td>Max. operating temperature</td>
<td>75 °C (in combination with connection hoses 55 °C)</td>
</tr>
</tbody>
</table>

The quick sizing table contains operating points for defined reference units, whereby the data for devices without flow rate control subassemblies apply. For other operating points, you may use the Easy Product Finder design programme.

Reference values

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Cooling</th>
<th>Heating</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i_R)</td>
<td>26 °C</td>
<td>22 °C</td>
</tr>
<tr>
<td>(i_W)</td>
<td>16 °C</td>
<td>22 °C</td>
</tr>
<tr>
<td>(i_{WV})</td>
<td>16 °C</td>
<td>50 °C</td>
</tr>
<tr>
<td>(V_W)</td>
<td>110 l/h</td>
<td>110 l/h</td>
</tr>
</tbody>
</table>
Active chilled beams of Type DID-E2, with one-way air discharge are a low-noise alternative to fan coil units, providing high thermal output and high thermal comfort levels.

For installation into ceiling bulkheads, preferably in rooms with a height up to 4.00 m.

The units consist of a casing with suspension points, a spigot, non-combustible nozzles, and a horizontal heat exchanger.

Five nozzle variants to optimise induction based on demand.

**Special features**
- One-way air discharge
- Horizontal heat exchanger as 2-pipe or 4-pipe system
- The connection points are at the back of the unit, which is typically connected from the corridor
- The supply air spigot is extendable to compensate for structural tolerances
- Nominal sizes are based on the basic dimensions
- Integral volume flow controller as an option

**Materials and surfaces**
- Casing, nozzle plate, supply air spigot and installation subframe for secondary air grille made of galvanised sheet steel
- Heat exchanger with copper tubes and aluminium fins
- Surface of the casing and heat exchanger optionally available in black (RAL 9005)

**Technical data**
- Nominal length: 1000, 1125, 1250 mm
- Length: 1000, 1125, 1250 mm
- Width: 519, 616, 711, 808 mm
- Height: 207, 212 mm
- Primary air spigot, diameter: 123, 158 mm
- Primary air volume flow rate: 8 – 57 l/s or 29 – 205 m³/h
- Cooling capacity: up to 1600 W
- Heating capacity: up to 1000 W
- Maximum operating pressure, water side: 10 bar (in combination with connection hoses 6 bar)
- Maximum operating temperature: 75 °C (in combination with connection hoses 55 °C)

**Sizing data**

**Primary air**
- \( V \) [m³/h]
- \( \Delta p \) [Pa]

**Air-regenerated noise**
- \( L_{WA} \) [dB(A)]

**Cooling**
- \( Q_{W} \) [W]

**Heating**
- \( Q_{H} \) [W]

This specification text describes the general properties of the product. Texts for variants can be generated with our Easy Product Finder design programme.

**DID-E2-2-S1-R/1000x320x123**
### Heat Exchanger

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat exchanger</td>
<td>2-pipe</td>
</tr>
<tr>
<td>Nozzle variant</td>
<td>Medium</td>
</tr>
<tr>
<td>Arrangement of water connections</td>
<td>Right side</td>
</tr>
<tr>
<td>Nominal length x heat exchanger depth x primary air spigot</td>
<td>1000 x 320 x 123</td>
</tr>
</tbody>
</table>

**DID-E2-4-H2-L-A2/1250x512x158/VC/Z/ERS/G1**

<table>
<thead>
<tr>
<th>Heat exchanger</th>
<th>4-pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nozzle variant</td>
<td>Nozzle mix (50 % S2 nozzle and 50 % HP nozzle)</td>
</tr>
<tr>
<td>Arrangement of water connections</td>
<td>Left side</td>
</tr>
<tr>
<td>Water connection</td>
<td>With union nut G½” and flat seal</td>
</tr>
<tr>
<td>Nominal length x heat exchanger depth x primary air spigot</td>
<td>1250 x 512 x 158</td>
</tr>
<tr>
<td>Volume flow control</td>
<td>With flow rate control subassembly</td>
</tr>
<tr>
<td>Supply air spigot</td>
<td>With extension spigot for supply air</td>
</tr>
<tr>
<td>Installation subframe for secondary air grille</td>
<td>Installation subframe for secondary air grille, including safety cables for the grille</td>
</tr>
</tbody>
</table>

**Surface of casing and heat exchanger**

### Cooling Valve

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling valve</td>
<td>Cooling valve including actuator</td>
</tr>
<tr>
<td>KVS value – cooling valve</td>
<td>0.63</td>
</tr>
</tbody>
</table>

**Heating Valve**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heating valve</td>
<td>Heating valve including actuator</td>
</tr>
<tr>
<td>KVS value – heating valve</td>
<td>0.4</td>
</tr>
</tbody>
</table>

**Lockshield(s)**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lockshield(s)</td>
<td>With</td>
</tr>
</tbody>
</table>

### Secondary Air Grille

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary air grille</td>
<td>SL</td>
</tr>
<tr>
<td>Dimensions</td>
<td>925x525</td>
</tr>
<tr>
<td>Fixing</td>
<td>With concealed screw fixing</td>
</tr>
<tr>
<td>Surface of secondary air grille</td>
<td>RAL 9010</td>
</tr>
</tbody>
</table>

### Supply Air Grille

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply air grille</td>
<td>SL</td>
</tr>
<tr>
<td>Dimensions</td>
<td>925x125</td>
</tr>
<tr>
<td>Fixing</td>
<td>VS: With concealed screw fixing</td>
</tr>
<tr>
<td>Surface of supply air</td>
<td>RAL 9016</td>
</tr>
</tbody>
</table>

**DID-E2**

```
DID – E2 – 4 – S2 – R – A2 / 1000 x 512 x 123 / VC / Z / ERS / G1
```
**Type**
- DID-E2 Active chilled beam

**Heat exchanger**
- 2 2-pipe
- 4 4-pipe

**Nozzle variants**
- HE Small
- S1 Medium
- S2 Large
- HP Extra large
- H2 Nozzle mix (50% S2 nozzle and 50% HP nozzle)

**Position of water connections**
- R Right
- L Left

**Water connections**
- No entry required: pipe with plain tails Ø12 mm
- A1 With external thread G½" and flat seal
- A2 With union nut G½" and flat seal

**Nominal length × heat exchanger depth ×**

- Primary air spigot [mm]:
  - 1000 × 320 × 123 to fit basic dimensions 1000 mm
  - 1000 × 512 × 158 to fit basic dimensions 1000 mm
  - 1125 × 320 × 123 to fit basic dimensions 1125 mm
  - 1125 × 512 × 158 to fit basic dimensions 1125 mm
  - 1250 × 320 × 123 to fit basic dimensions 1250 mm
  - 1250 × 512 × 158 to fit basic dimensions 1250 mm

**Volume flow control**
- No entry required: without
- VC With flow rate control subassembly

**Supply air spigot**
- No entry required: without
- Z With extension spigot for supply air

**Installation subframe for secondary air grille**
- No entry required: without
- ERS Installation subframe for secondary air grille from the TROX grill range

**Surface of casing and heat exchanger**
- No entry required: rough, galvanised sheet steel casing - heat exchanger, copper tubes and aluminium fins
- G1 Surface similar to RAL 9005, jet black

**Control components**

- **KV – 0,63 / HV – 0,4 / R**

1. Cooling valve
   - No entry required: without
   - KV Cooling valve including actuator

2. KVS valve – cooling valve
   - 0.25
   - 0.40
   - 0.63
   - 1.00

3. Heating valve
   - No entry required: without
   - HV Heating valve including actuator

4. KVS value – heating valve
   - 0.25
   - 0.40
   - 0.63
   - 1.00

5. Lockshield(s)
   - No entry required: without
   - R With (KVS value 1.32)

**Secondary air grille**
AH-0 / 925 x 525 / VS / P1-RAL 9016

- Secondary air grille
  - No entry required: without secondary air grille (suction via gap / shadow gap)
  - X-GRILLE Cover
  - X-GRILLE Basic
  - AH-0
  - SL
  - TRS
  - LB Perforated plate 50 % free area

- Dimensions
  - 925 x 345
  - 925 x 525
  - 1050 x 345
  - 1050 x 525
  - 1175 x 345
  - 1175 x 525

- Fixing
  - No entry required: without (only with X-GRILLE Cover and TRS)
  - A11  Countersunk hole (only with AH)
  - VS  With concealed screw fixing

- Surface of secondary air grille
  - No entry required: standard finish of the respective standard grille
  - P1  Powder-coated, colour RAL ... Classic
  - P2  Powder coating covers, Colour RAL ... Classic (only applies for X-GRILLE Cover)

Supply air grille

AH-0 / 925 x 125 / VS / P1-RAL 9016

- Supply air grille
  - X-GRILLE Cover
  - X-GRILLE Basic
  - SL
  - TRS

- Dimensions
  - 925 x 125
  - 1050 x 125
  - 1175 x 125

- Fixing
  - No entry required: without (only with X-GRILLE Cover and TRS)
  - A11  Countersunk hole (only with AH)
  - VS  With concealed screw fixing
Surface of supply air grille

No entry required: standard finish of the respective standard grille

P1 Powder-coated, colour RAL ... CLASSIC
P2 Powder coating covers, Colour RAL ... Classic (only with X-GRILLE Cover)

Variants, Dimensions and weight

AH

Dimensions [mm]

<table>
<thead>
<tr>
<th>Lx</th>
<th>L</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>1000</td>
<td>940</td>
</tr>
<tr>
<td>1125</td>
<td>1125</td>
<td>1065</td>
</tr>
<tr>
<td>1250</td>
<td>1250</td>
<td>1190</td>
</tr>
</tbody>
</table>

Dimensions [mm]

<table>
<thead>
<tr>
<th>ØD</th>
<th>ØH</th>
</tr>
</thead>
<tbody>
<tr>
<td>519</td>
<td>320</td>
</tr>
<tr>
<td>711</td>
<td>512</td>
</tr>
</tbody>
</table>

Dimensions [mm]

<table>
<thead>
<tr>
<th>ØH</th>
</tr>
</thead>
<tbody>
<tr>
<td>123</td>
</tr>
<tr>
<td>158</td>
</tr>
</tbody>
</table>

Weight (4L, 123, R+L) [kg]

<table>
<thead>
<tr>
<th>Nominal length (Lx)</th>
<th>1000 x 320</th>
<th>1000 x 512</th>
<th>1125 x 320</th>
<th>1125 x 512</th>
<th>1250 x 320</th>
<th>1250 x 512</th>
</tr>
</thead>
<tbody>
<tr>
<td>DID-E2</td>
<td>15,5</td>
<td>20,5</td>
<td>17,0</td>
<td>23,0</td>
<td>19,0</td>
<td>25,0</td>
</tr>
<tr>
<td>Supply air spigot Z</td>
<td>1,7</td>
<td>1,7</td>
<td>1,9</td>
<td>1,9</td>
<td>2,1</td>
<td>2,1</td>
</tr>
<tr>
<td>Installation subframe ERS</td>
<td>1,4</td>
<td>1,5</td>
<td>1,6</td>
<td>1,7</td>
<td>1,8</td>
<td>1,9</td>
</tr>
<tr>
<td>Contained water WÜ</td>
<td>1,5</td>
<td>2,5</td>
<td>1,8</td>
<td>3,0</td>
<td>2,1</td>
<td>3,5</td>
</tr>
</tbody>
</table>

Dimensions [mm]
Weight (4L, 123, R+L) [kg]

<table>
<thead>
<tr>
<th>Nominal length (L\textsubscript{A})</th>
<th>1000 x 320</th>
<th>1000 x 512</th>
<th>1125 x 320</th>
<th>1125 x 512</th>
<th>1250 x 320</th>
<th>1250 x 512</th>
</tr>
</thead>
<tbody>
<tr>
<td>DID-E2\textsuperscript{2}^-VC</td>
<td>21.5</td>
<td>26.5</td>
<td>24.0</td>
<td>29.5</td>
<td>26.0</td>
<td>32.0</td>
</tr>
<tr>
<td>Supply air spigot Z</td>
<td>1.7</td>
<td>1.7</td>
<td>1.9</td>
<td>1.9</td>
<td>2.1</td>
<td>2.1</td>
</tr>
<tr>
<td>Installation subframe ERS</td>
<td>1.4</td>
<td>1.5</td>
<td>1.6</td>
<td>1.7</td>
<td>1.8</td>
<td>1.9</td>
</tr>
<tr>
<td>Contained water WÜ</td>
<td>1.5</td>
<td>2.5</td>
<td>1.8</td>
<td>3.0</td>
<td>2.1</td>
<td>3.5</td>
</tr>
</tbody>
</table>

DID-E2...
DID-E2... - Water connections pipe with plain tails

DID-E2-*A1 - Water connections external thread G½”

DID-E2-*A2 - Water connections G½” union nut
Installation details, Basic information and nomenclature

DID-E2-* Water connections pipe with plain tails

DID-E2-*A1 Water connections external thread G½”

DID-E2-*A2 Water connections G½” union nut

Installation and commissioning

- Preferably for rooms with a clear height up to 4.00 m
- Installation into ceiling bulkheads
- Side entry primary air spigot
- Lengths to fit basic dimensions 1000, 1125 and 1250 mm
- Heat exchanger depths 320 mm and 512 mm
- Primary air spigot 123 mm and 158 mm
- Installation and connections to be performed by others; fixing, connection and sealing material to be provided by others
- Active chilled beam has 4 suspension points (slotted hole 38 x 8.5 mm) for on-site installation by others
- Heat exchangers are fitted with water flow and water return connections at the rear, usually towards the corridor
- With the optionally available supply air spigot, which works like a sliding spigot, installation areas of 38 – 78 mm are bridged
- Secondary air can be suctioned through a grille from the TROX grille range, the perforated metal plate especially developed for the DIDE2 or through an opening or shadow gap provided by others
- Secondary air grills must be secured with safety cables The optionally available installation subframe for secondary air grilles has safety cables that can be mounted on the grille

Nomenclature

$L_{WA}$ [dB(A)]
Sound power level

$t_p$ [°C]
Primary air temperature

$t_{wv}$ [°C]
Water flow temperature – cooling/heating

$t_r$ [°C]
Room temperature

$t_{AN}$ [°C]
Secondary air intake temperature

$Q_p$ [W]
Thermal output – primary air

$Q_{thc}$ [W]
Thermal output – total

$Q_w$ [W]
Thermal output – water side, cooling/heating

$V_p$ [l/s/m³/h]
Primary air volume flow rate

$V_w$ [l/h]
Water flow rate – cooling/heating

$V$ [l/h]
Volume flow rate

$\Delta t_w$ [K]
Temperature difference – water

$\Delta p_w$ [kPa]
Water side pressure drop

$\Delta p$ [Pa]
Total pressure drop, air side
\[ \Delta t_v = t_v - t_r \ [\text{K}] \]
Difference between primary air temperature and room temperature

\[ \Delta t_{\text{WV}} = t_{\text{WV}} - t_r \ [\text{K}] \]
Difference between water flow temperature and room temperature

\[ \Delta t_{\text{Wm-Ref}} \ [\text{K}] \]
Difference between mean water temperature and reference temperature

**Principal dimensions**

\[ L_n \ [\text{mm}] \]
Nominal length

**Mixed flow**

The supply air is discharged from the air terminal device into the space with a velocity between 2 and 5 m/s. The resulting air jet mixes with the room air, ventilating the entire space. The mixed flow air distribution typically provides a uniform temperature distribution and air quality within the space. The originally high velocity of the turbulent air jets decreases rapidly due to the high induction levels of mixed flow air distribution systems.

**Heat exchanger**

The maximum water-side operating pressure for all heat exchangers is 10 bar. When flexible hoses are used, the maximum water-side operating pressure is limited to 6 bar.

The maximum water flow temperature (heating circuit) for all heat exchangers is 75 °C; if flexible hoses are used, the water flow temperature should not exceed 55 °C. Units for other pressures and temperatures are available on request.

The water flow temperature (cooling circuit) should be at least 16 °C such that it does not permanently fall below the dew point. For units with a condensate drip tray, the water flow temperature may be reduced to 15 °C.

**Heat exchanger as 2-pipe system**

Air-water systems with a 2-pipe heat exchanger may be used for either heating or cooling. In changeover mode, it is possible to use all units within a water circuit exclusively for cooling in summer and exclusively for heating in winter.

**Heat exchanger as 4-pipe system**

Air-water systems with a 4-pipe heat exchanger may be used for both heating and cooling. Depending on the season, i.e. especially in spring and autumn, it may be possible that an office has to be heated in the morning and cooled in the afternoon.
Heat exchanger as 2-pipe system

Heat exchanger as 4-pipe system