Heat Recovery Ventilation

Air Handling Units
Airflow are a world leader in the design, manufacture and distribution of high quality air movement equipment since 1955.

We specialize in residential ventilation with our iCON and Classic ranges of extract fans. Our Commercial HVAC and Industrial fans are designed for ventilation cooling, air dilution and used in mechanical ventilation with heat recovery.

For further information
Call us on 0845 330 1047

**Duplexvent**

**Selection Software**

A very helpful and practical tool to assist with the correct selection of a Duplex unit to meet your specification.

The software enables detailed calculations of efficiency, heating and cooling capacities, as well as other built-in and optional components including control systems. The software can create a complete report detailing specifications, drawings and wiring diagrams which can be exported to standard Microsoft packages or in DXF format for Autocad.
Compact air handling units

**DUPLEX**

*a new generation*

---

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<td>20 – 31</td>
</tr>
</tbody>
</table>

---

![Diagram of compact air handling units](image)

---

**Diagram**

- KP 01
- ON
- OFF
- 3
- OFF
- AM
- ON
- 3
- OFF
- AM
- ON
- i2
- e2
- i1
- e1
- i2 i2
- e2 e2 e2
- i1 i1
- e1 e1
**DUPLEX 2000 – 8000**

multi-purpose compact heat recovery ventilators

The compact DUPLEX 2000 – 8000 heat recovery ventilators are used for comfort ventilation, as well as warm air heating and cooling of small office areas, shops, retail facilities, school buildings, restaurants, small stores, sport centers, industrial halls and swimming pools.

The units are suitable for all facilities where effective ventilation or warm air circulation heating/cooling at minimum operating costs is required; it means high-efficient heat recovery, low power consumption of fans and minimum noise level.

The units are available in two basic versions:
- indoor version
- rooftop version (with double insulation)

The DUPLEX unit is designed as compact appliance. In single casing it contains: two independently driven centrifugal fans with anti-vibration motor support, high-efficient cross-flow air-to-air heat recovery core assembled from thin plastic plates, removable supply and exhaust air filters of the G4 or F7 class, condensation pans, an optional internal bypass with a remote-controlled actuator and an internal mixing damper.

The unit casing consists of steel L-profile frame and sandwich panels made of aluminum metal sheets filled with polyurethane insulation (thermal resistance $R = 1.05 \text{ m}^2\text{K} / \text{W}$, or $2.1 \text{ m}^2\text{K} / \text{W}$). The sandwich panels are fixed to the frame. A front access door enables comfortable access to all components and filters. Standard surface finish.

Inlet and outlet ports are round or rectangular with different location configuration based on an order.

Indoor ports of the rooftop unit are from bottom and outdoor ports are fitted with hoods. They can optionally be fitted with sound attenuators. It is recommended that both shutoff air dampers be installed to prevent draft.

The units can be equipped with high-efficient EC fans with optional constant volume flow control.

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**Features of the DUPLEX units**

- highly compact shape enables space reduction up to 60% compared to units with modular construction
- low purchase cost
- eight (sixteen) different installation configurations for the indoor type
- choice of non-standard connection ports (round or rectangular) on request
- very low noise level
- low weight
- low power input
- high efficiency of heat recovery
- different types of complete control systems based on application complexity; fully integrated into the unit
- high chemical resistance of the hPS heat exchanger
- optional hygienic design according to the VDI 6022
- optional delivery in disassembled state for inaccessible spaces

---

**Available Modifications (Can be combined)**

<table>
<thead>
<tr>
<th>Indoor type</th>
<th>Rooftop type</th>
</tr>
</thead>
<tbody>
<tr>
<td>- B</td>
<td>- N-B</td>
</tr>
<tr>
<td>- C</td>
<td>- N-C</td>
</tr>
<tr>
<td>- T</td>
<td>- N-T</td>
</tr>
<tr>
<td>- CHF</td>
<td>- N-CHF</td>
</tr>
<tr>
<td>- CHW</td>
<td>- N-CHW</td>
</tr>
<tr>
<td>with built-in bypass</td>
<td>with built-in bypass</td>
</tr>
<tr>
<td>with built-in mixing damper</td>
<td>with built-in mixing damper</td>
</tr>
<tr>
<td>with built-in hot water heating coil</td>
<td>with built-in hot water heating coil</td>
</tr>
<tr>
<td>with built-in DX cooling coil</td>
<td>with built-in DX cooling coil</td>
</tr>
<tr>
<td>with built-in chilled water cooling coil</td>
<td>with built-in chilled water cooling coil</td>
</tr>
</tbody>
</table>

---

**Operating Modes of the Duplex Units**

1. Equal-pressure ventilation with heating or cooling
2. Combined mode with air mixing and heating or cooling
3. Circulation heating or cooling
4. Ventilation without heat recovery (via by-pass)

---

**Selection Software**

For detailed selection of Duplex units, accessories and control system we recommend to use our special selection software.

To select a heat recovery exchanger you can use our special selection software. Download it from our webpage www.airflow.co.uk.

---

**Airflow Development Ltd.**

Lancaster Road, Cresssex Business Park
High Wycombe, Buckinghamshire HP12 3QP, England

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info@airflow.co.uk, www.airflow.co.uk
### INDOOR TYPE

<table>
<thead>
<tr>
<th>Type</th>
<th>Type 2000</th>
<th>Type 3000</th>
<th>Type 4000</th>
<th>Type 6000</th>
<th>Type 8000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply air - max. (^1) m(^3)/h</td>
<td>2 000</td>
<td>3 000</td>
<td>5 500</td>
<td>7 000</td>
<td>9 000</td>
</tr>
<tr>
<td>Exhaust air - max. (^1) m(^3)/h</td>
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<td>3 000</td>
<td>5 500</td>
<td>7 000</td>
<td>9 000</td>
</tr>
<tr>
<td>Heat recovery efficiency %</td>
<td>52 - 68</td>
<td>52 - 68</td>
<td>52 - 68</td>
<td>52 - 68</td>
<td>52 - 68</td>
</tr>
<tr>
<td>Number of configurations</td>
<td>160</td>
<td>160</td>
<td>160</td>
<td>160</td>
<td>32</td>
</tr>
<tr>
<td>Weight kg</td>
<td>110 165</td>
<td>160 200</td>
<td>160 320</td>
<td>160 390</td>
<td>240 480</td>
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<td>2</td>
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<tr>
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<td>-</td>
<td>-</td>
<td>-</td>
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<td>2</td>
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<tr>
<td>Max. heating capacity T kW</td>
<td>26</td>
<td>33</td>
<td>56</td>
<td>79</td>
<td>104</td>
</tr>
<tr>
<td>Max. cooling capacity CHW kW</td>
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<td>17</td>
<td>27</td>
<td>47</td>
<td>57</td>
</tr>
<tr>
<td>Max. cooling capacity CHF kW</td>
<td>13</td>
<td>18</td>
<td>29</td>
<td>49</td>
<td>59</td>
</tr>
<tr>
<td>Filtration class (standard)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>G4</td>
</tr>
</tbody>
</table>

\(^1\) maximum volume flow through units at zero external pressure
\(^2\) according to heat recovery core type and air volume flow
\(^3\) according to selected accessories
\(^4\) according to coil and fluid type

### ROOFTOP TYPE

<table>
<thead>
<tr>
<th>Type</th>
<th>Type 2000</th>
<th>Type 3000</th>
<th>Type 4000</th>
<th>Type 6000</th>
<th>Type 8000</th>
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</thead>
<tbody>
<tr>
<td>Supply air - max. (^1) m(^3)/h</td>
<td>2 000</td>
<td>3 000</td>
<td>5 500</td>
<td>7 000</td>
<td>9 000</td>
</tr>
<tr>
<td>Exhaust air - max. (^1) m(^3)/h</td>
<td>2 000</td>
<td>3 000</td>
<td>5 500</td>
<td>7 000</td>
<td>9 000</td>
</tr>
<tr>
<td>Heat recovery efficiency %</td>
<td>52 - 68</td>
<td>52 - 68</td>
<td>52 - 68</td>
<td>52 - 68</td>
<td>52 - 68</td>
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<td>-</td>
<td>-</td>
<td>32</td>
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<tr>
<td>Weight kg</td>
<td>110 320</td>
<td>230 410</td>
<td>355 530</td>
<td>454 630</td>
<td>420 760</td>
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<tr>
<td>Number of fans</td>
<td>-</td>
<td>-</td>
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<td>2</td>
</tr>
<tr>
<td>Max. power input kW</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Max. heating capacity T kW</td>
<td>26</td>
<td>33</td>
<td>56</td>
<td>79</td>
<td>104</td>
</tr>
<tr>
<td>Max. cooling capacity CHW kW</td>
<td>12</td>
<td>17</td>
<td>27</td>
<td>47</td>
<td>57</td>
</tr>
<tr>
<td>Max. cooling capacity CHF kW</td>
<td>13</td>
<td>18</td>
<td>29</td>
<td>49</td>
<td>59</td>
</tr>
<tr>
<td>Filtration class (standard)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>G4</td>
</tr>
</tbody>
</table>

\(^1\) maximum volume flow through units at zero external pressure
\(^2\) according to heat recovery core type and air volume flow
\(^3\) according to selected accessories
\(^4\) according to coil and fluid type

### PERFORMANCE CURVES (INDOOR TYPE)

Note: for performance curves of a rooftop version see the respective catalog sheet

### HEATING AND COOLING CAPACITY, HEAT RECOVERY EFFICIENCY

- Max. heating capacity data T are valid for 80/60 °C water temperature drop and +3 °C r.h. 30 % supply air
- Max. cooling capacity data CHW are valid for 30 % water/ethylene-glycol mixture, 6/12 °C temperature drop, +30 °C r.h. 50 % supply air

- Maximum heating capacity for T3
- Maximum cooling capacity for CHW5 and CHF5

Low limit is without condensation and with equal air volume flow rate (M1 = Me)
MANIPULATION SPACE

When installing DUPLEX units it is necessary to allow for recommended free manipulation space around the unit. Minimum space of 150 mm is needed under a unit to install a DN 32 condensate drain pipe. A trap of minimum height of 150 mm must be installed before connecting the pipe to a building sewer. The recommended space is easily ensured when delivered standard base steel legs are used.

Unit front service space is needed for opening access door; filter removal and access to all components for maintenance. Respective data sheets show the minimum space for hinged door (easier access), and quick lock door (more difficult access).

Minimum manipulation space on the control panel side is 600 mm for all units.

Units equipped with heating/cooling coil hydraulic kit require free manipulation on the kit side.

The sound pressure level is measured at 1 m from the respective unit.

<table>
<thead>
<tr>
<th>Type</th>
<th>Fan</th>
<th>Operation point</th>
<th>Sound pow. Lw [dB(A)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.005</td>
<td>230 V 1600 m³/h</td>
<td>e_inlet</td>
<td>57.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e_outlet</td>
<td>75.6</td>
</tr>
<tr>
<td></td>
<td>150 V 1210 m³/h</td>
<td>e_inlet</td>
<td>56.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e_outlet</td>
<td>70.0</td>
</tr>
<tr>
<td>M.007</td>
<td>230 V 1800 m³/h</td>
<td>e_inlet</td>
<td>57.0</td>
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<tr>
<td></td>
<td></td>
<td>e_outlet</td>
<td>75.5</td>
</tr>
<tr>
<td></td>
<td>150 V 1100 m³/h</td>
<td>e_inlet</td>
<td>58.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e_outlet</td>
<td>66.5</td>
</tr>
<tr>
<td>M.006</td>
<td>230 V 2600 m³/h</td>
<td>e_inlet</td>
<td>58.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e_outlet</td>
<td>80.7</td>
</tr>
<tr>
<td></td>
<td>115 V 1215 m³/h</td>
<td>e_inlet</td>
<td>52.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e_outlet</td>
<td>62.4</td>
</tr>
<tr>
<td>M.013</td>
<td>230 V 1800 m³/h</td>
<td>e_inlet</td>
<td>54.4</td>
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<tr>
<td></td>
<td></td>
<td>e_outlet</td>
<td>71.0</td>
</tr>
<tr>
<td></td>
<td>115 V 1080 m³/h</td>
<td>e_inlet</td>
<td>57.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e_outlet</td>
<td>47.4</td>
</tr>
<tr>
<td>M.014</td>
<td>230 V 2400 m³/h</td>
<td>e_inlet</td>
<td>59.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e_outlet</td>
<td>76.5</td>
</tr>
<tr>
<td></td>
<td>150 V 1390 m³/h</td>
<td>e_inlet</td>
<td>55.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e_outlet</td>
<td>66.0</td>
</tr>
<tr>
<td>M.010</td>
<td>400 V 4000 m³/h</td>
<td>e_inlet</td>
<td>63.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e_outlet</td>
<td>84.4</td>
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<table>
<thead>
<tr>
<th>Type</th>
<th>Fan</th>
<th>Operation point</th>
<th>Sound pow. Lw [dB(A)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.010</td>
<td>160 V 1535 m³/h</td>
<td>e_inlet</td>
<td>60.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e_outlet</td>
<td>79.1</td>
</tr>
<tr>
<td>M.015</td>
<td>230 V 3500 m³/h</td>
<td>e_inlet</td>
<td>60.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e_outlet</td>
<td>81.6</td>
</tr>
<tr>
<td>M.017</td>
<td>400 V 5390 m³/h</td>
<td>e_inlet</td>
<td>58.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e_outlet</td>
<td>76.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Fan</th>
<th>Operation point</th>
<th>Sound pow. Lw [dB(A)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.005</td>
<td>230 V 1600 m³/h</td>
<td>unit</td>
<td>52.9</td>
</tr>
<tr>
<td>M.007</td>
<td>230 V 1800 m³/h</td>
<td>unit</td>
<td>55.5</td>
</tr>
<tr>
<td>M.006</td>
<td>230 V 2600 m³/h</td>
<td>unit</td>
<td>52.5</td>
</tr>
<tr>
<td>M.010</td>
<td>230 V 1800 m³/h</td>
<td>unit</td>
<td>45.8</td>
</tr>
<tr>
<td>M.012</td>
<td>230 V 2400 m³/h</td>
<td>unit</td>
<td>51.2</td>
</tr>
<tr>
<td>M.013</td>
<td>230 V 1800 m³/h</td>
<td>unit</td>
<td>53.3</td>
</tr>
<tr>
<td>M.014</td>
<td>150 V 1390 m³/h</td>
<td>unit</td>
<td>42.8</td>
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<tr>
<td>M.010</td>
<td>400 V 4000 m³/h</td>
<td>unit</td>
<td>59.8</td>
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<tr>
<td>M.012</td>
<td>160 V 1535 m³/h</td>
<td>unit</td>
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<td>400 V 6300 m³/h</td>
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<td>M.017</td>
<td>160 V 3790 m³/h</td>
<td>unit</td>
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<td>M.012</td>
<td>160 V 3400 m³/h</td>
<td>unit</td>
<td>62.6</td>
</tr>
<tr>
<td>M.016</td>
<td>400 V 6500 m³/h</td>
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<tr>
<td>M.017</td>
<td>160 V 7900 m³/h</td>
<td>unit</td>
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<tr>
<td>M.017</td>
<td>160 V 5390 m³/h</td>
<td>unit</td>
<td>50.8</td>
</tr>
</tbody>
</table>

The sound pressure level is measured at 1 m from the respective unit.
DUPLEX 15000

Compact unit ventilators
with heat recovery

The compact units ventilators of the DUPLEX 15000 series are used for comfort ventilation of large shops, school facilities, restaurants, stores, sports centres, industrial halls and swimming halls.

The units are suitable for applications with efficient ventilation with heat/cool recovery, possibly warm-air circulation heating and cooling with minimum operation cost, i.e. with high recovery efficiency, low fan power input and minimum noise level.

The units are available in two basic versions:
- indoor version
- rooftop version (with double insulation)

The DUPLEX unit is designed as compact appliance. In single casing it contains: two independently driven centrifugal fans with anti-vibration motor support, high-efficient cross-flow air-to-air heat recovery core assembled from thin plastic plates, removable supply and exhaust air filters of the G4 or F7 class, condensation pans, an optional internal by-pass with a remote-controlled actuator and an internal mixing damper.

The unit casing consists of steel L-profile frame and sandwich panels made of aluminium metal sheets filled with polyurethane insulation (thermal resistance $R = 1.05 \text{ mK/kW}$, or $2.1 \text{ mK/kW}$). The sandwich panels are fixed to the frame. A front access door enables comfortable access to all components and filters. Standard surface finish.

Inlet and outlet ports are rectangular with various location based on an order:
- In rooftop version the inlets/outlets are from bottom and the ports are covered by extension, optionally with noise attenuators. Standardly equipped with both shutoff dampers to prevent draft.
- An indoor version is always delivered in sections, optionally in a disassembled state with assembly on site by the manufacturer.
- A rooftop version is delivered in separate sections to be assembled on site on a common base frame.

Features of the DUPLEX units
- considerable compactness ensures space saving up to 60 % compared with modular units
- low purchase cost
- optional custom-made port design
- low power input
- direct-driven fans; no need for additional filtration
- high efficiency of heat recovery
- different types of complete control systems based on application complexity; fully integrated into the unit
- high chemical resistance of the hPS heat exchanger
- optional hygienic design according to VDI 6022
- delivery in disassembled state for inaccessible areas

Available Modifications (Can be combined)

Indoor type
- B with built-in by-pass
- C with built-in mixing damper
- T with built-in hot water heating coil
- CHF with built-in DX cooling coil
- CHW with built-in chilled water cooling coil

Rooftop type
- N-B with built-in by-pass
- N-C with built-in mixing damper
- N-T with built-in hot water heating coil
- N-CHF with built-in DX cooling coil
- N-CHW with built-in glycol chilled water cooling coil

Operating Modes of the DUPLEX Units

1. Equal-pressure ventilation with heating or cooling
2. Combined mode with air mixing and heating or cooling
3. Circulation heating or cooling
4. Ventilation without heat recovery (via by-pass)

Selection Software

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HP12 3QP, England
Tel. (Int +44) (UK 0) 1494 525252, Fax: (Int +44) (UK 0) 1494 461073
info@airflow.co.uk, www.airflow.co.uk
maximum volume flow through units at zero external pressure

- according to selected accessories

- the parameters of DUPLEX 15 000 with the M021 fans are valid only when used with 60 Hz/400 V inverter control!

- according to coil and fluid type

### Summary Performance Curves (Indoor Version)

#### Indoor Type

<table>
<thead>
<tr>
<th>Fan type</th>
<th>M020</th>
<th>M021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan protection</td>
<td>IP54</td>
<td>IP10</td>
</tr>
<tr>
<td>Supply air - max.</td>
<td>m³/h</td>
<td>13 500</td>
</tr>
<tr>
<td>Exhaust air - max.</td>
<td>m³/h</td>
<td>13 500</td>
</tr>
<tr>
<td>Heat recovery efficiency</td>
<td>%</td>
<td>55 – 65</td>
</tr>
<tr>
<td>Number of configurations</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>Weight*</td>
<td>kg</td>
<td>690 – 870</td>
</tr>
<tr>
<td>Number of fans</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Max. power input</td>
<td>kW</td>
<td>2x 3.7</td>
</tr>
<tr>
<td>Voltage</td>
<td>V</td>
<td>400</td>
</tr>
<tr>
<td>Frequency</td>
<td>Hz</td>
<td>50</td>
</tr>
<tr>
<td>Speed</td>
<td>rpm</td>
<td>1 390</td>
</tr>
<tr>
<td>Max. heating capacity T</td>
<td>kW</td>
<td>185</td>
</tr>
<tr>
<td>Max. cooling capacity CHW</td>
<td>kW</td>
<td>59</td>
</tr>
<tr>
<td>Max. cooling capacity CHF</td>
<td>kW</td>
<td>65</td>
</tr>
<tr>
<td>Filtration class (standard)</td>
<td>-</td>
<td>G4</td>
</tr>
</tbody>
</table>

#### Rooftop Type

Will be specified in Autumn of 2007

---

* The maximum heating capacity for T.2 is 185 kW, and the maximum cooling capacities for CHW and CHF are 59 kW and 65 kW, respectively. The parameters of DUPLEX 15 000 with M021 fans are valid only when used with 60 Hz/400 V inverter control. According to coil and fluid type.
**Outdoor Type**

Will be specified in Autumn of 2007

**Port Types and Dimensions**

<table>
<thead>
<tr>
<th>Type</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangular</td>
<td>675 X 675</td>
</tr>
<tr>
<td>Basic port</td>
<td>80</td>
</tr>
<tr>
<td>Port with flexible connection</td>
<td>150</td>
</tr>
<tr>
<td>Port with damper</td>
<td>110</td>
</tr>
<tr>
<td>Port with damper and flexible connection</td>
<td>260</td>
</tr>
</tbody>
</table>

**Fixing, Base Frames**

Will be specified in Autumn of 2007
When installing DUPLEX units it is necessary to allow for recommended free manipulation space around the unit. Minimum space of 150 mm is needed under a unit to install a DN 32 condensate drain pipe. A trap of minimum height of 150 mm must be installed before connecting the pipe to a building sewer. This height is ensured when standardly supplied steel base frame is used.

Unit front service space is needed for opening access door, filter removal and service access for T and CH coil replacement. Minimum manipulation space on the control panel side is 600 mm for all units. Units equipped with heating/cooling coil hydraulic kit require free manipulation on the kit side.

The sound pressure level is measured at 1 m from the respective unit.
DUPLEX-S 1500 to 5600
multi-purpose compact unit
ventilators with counterflow
heat recovery core

Indoor compact unit ventilators of DUPLEX-S 1500 to 5600 series are used for comfort ventilation, as well as warm-air heating and cooling of small office areas, shops, retail facilities, school buildings, restaurants, small stores, sport centres, industrial halls and swimming pools.

The units are suitable for all facilities where effective ventilation or warm air circulation heating/cooling at minimum operating costs is required; it means high-efficient heat recovery, low power consumption of fans and minimum noise level.

The units are available in two basic versions:
- indoor version
- rooftop version (with double insulation)

The DUPLEX-S unit is designed as a compact appliance. In single casing it contains: two independently controlled centrifugal fans with anti-vibration motor support, high-efficient counterflow air-to-air heat recovery core assembled from thin plastic plates, removable supply and exhaust air filters of the G4 or F7 class, condensation pans, an optional internal by-pass with a remote-controlled actuator and a mixing damper with an actuator.

The unit casing consists of steel L-profile frame and sandwich panels made of aluminum metal sheets filled with polyurethane insulation (tepelný odpor $R = 1.05 \text{ m}\cdot\text{K}^\circ\text{W}$, resp. $2.1 \text{ m}\cdot\text{K}^\circ\text{W}$). The sandwich panels are fixed to the frame. A front access door enables comfortable access to all components and filters. Standard surface finish. Inlet and outlet ports are round or rectangular with different location configuration based on an order.

In the rooftop units inlet and outlet ports are standardly covered by hoods. We recommend that both shutoff dampers be installed to prevent drafts.

Features of the DUPLEX-S units
- high recovery efficiency of counterflow exchanger – up to $80\%$
- highly compact shape enables space reduction up to $60\%$ compared to units with modular design
- low purchase cost
- up to 32 installation configurations
- choice of non-standard connection ports (round or rectangular) on request
- very low noise level
- low weight
- low power input
- different types of complete built-in control systems based on application complexity, fully integrated into the unit
- high chemical resistance of the hPS exchanger
- optional hygienic design according to the VDI 6022
- optional delivery in disassembled state for inaccessible spaces

Available modifications (can be combined)

<table>
<thead>
<tr>
<th>Indoor type</th>
<th>Rooftop type</th>
</tr>
</thead>
<tbody>
<tr>
<td>- B</td>
<td>- N-B</td>
</tr>
<tr>
<td>- C</td>
<td>- N-C</td>
</tr>
<tr>
<td>- T</td>
<td>- N-T</td>
</tr>
<tr>
<td>- CHF</td>
<td>- N-CHF</td>
</tr>
<tr>
<td>- CHW</td>
<td>- N-CHW</td>
</tr>
</tbody>
</table>

- B with built-in bypass
- C with built-in mixing damper
- T with built-in hot water heating coil
- CHF with built-in DX cooling coil
- CHW with built-in chilled water cooling coil
- N-B with built-in bypass
- N-C with built-in mixing damper
- N-T with built-in glycol heating coil
- N-CHF with built-in glycol DX cooling coil
- N-CHW with built-in glycol chilled water cooling coil

Operating modes of the Duplex-S units

- Ventilation with heat recovery with heating/cooling
- Combined ventilation with air mixing and heating/cooling
- Circulation heating, or cooling
- Ventilation without recovery (via bypass)

Selection software
For detailed selection of Duplex units, accessories and control system we recommend to use our special selection software.
To select a heat recovery exchanger you can use our special selection software.
Download it from our webpage www.airflow.co.uk
**INDOOR TYPE**

**DUPLEX-S**
- **Supply air** – max. m³/h: 1 500, 2 200, 3 200, 4 900, 5 700
- **Exhaust air** – max. m³/h: 1 450, 2 000, 3 000, 4 900, 5 700
- **Recovery efficiency** %: ≥ 80
- **Configurations**: see the „installation positions“ table
- **Weight**: kg 125–200
- **Max. power input**: kW based on fan type
- **Power supply**: V 230, 400
- **Frequency**: Hz 50
- **Speed** min based on fan type
- **Heating capacity T** – max.: kW 10, 13, 21, 32, 41
- **Cooling capacity CHW** – max.: kW 9, 12, 20, 30, 39
- **Cooling capacity CHF** – max.: kW 10, 13, 21, 32, 41

1) maximum airflow through units at zero external pressure
2) based on air volume flow
3) based on accessories
4) based on coil type, medium, and water flow

**PERFORMANCE CURVES (INDOOR TYPE)**

- **Available pressure P_st (Pa)**
- **Volume flow rate (m³/h)**

**HEAT RECOVERY EFFICIENCY**

- **Heat recovery efficiency φ (%)**
- **Volume flow rate (m³/h)**

**HEATING AND COOLING CAPACITIES**

- **Max. heating capacity T** at water temp. drop of 80/60 °C, inlet air (after recovery) + 3 °C, rh 50 %
- **Max. cooling capacity CHW** at 30% water/ethylene glycol mixture temp. drop of 6/12 °C, outdoor air at 30 °C, rh 50 %

---

**ROOFTOP TYPE**

**DUPLEX-NS**
- **Supply air** – max. m³/h: 1 500, 2 200, 3 200, 6 500
- **Exhaust air** – max. m³/h: 1 450, 2 000, 3 000, 4 900, 5 700
- **Recovery efficiency** %: up to 80
- **Configurations**: see the „installation positions“ table
- **Weight**: kg 185–280
- **Max. power input**: kW based on fan type
- **Power supply**: V 230, 380–450
- **Frequency**: Hz 50
- **Speed** min based on fan type
- **Heating capacity T** – max.: kW 21, 24, 41, 63, 80
- **Cooling capacity CHW** – max.: kW 9, 12, 20, 30, 39
- **Cooling capacity CHF** – max.: kW 10, 13, 21, 32, 41

1) maximum airflow through units at zero external pressure
2) based on air volume flow
3) based on accessories
4) based on coil type, medium, and water flow

---

Note: for performance curves of a rooftop version see the respective catalog sheet.
**CONNECTION PORT DIMENSIONS**

### INDOOR TYPE

<table>
<thead>
<tr>
<th>PORT CONFIGURATION</th>
<th>1500</th>
<th>2200</th>
<th>3100</th>
<th>4500</th>
<th>5600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance A (mm)</td>
<td>1270</td>
<td>1350</td>
<td>1500</td>
<td>1500</td>
<td>1500</td>
</tr>
<tr>
<td>Distance B (mm)</td>
<td>435</td>
<td>565</td>
<td>650</td>
<td>870</td>
<td>1050</td>
</tr>
<tr>
<td>Length L0/L1 (mm)</td>
<td>1920</td>
<td>2120</td>
<td>2300</td>
<td>2300</td>
<td>2300</td>
</tr>
<tr>
<td>Length L2 (mm)</td>
<td>2100</td>
<td>2300</td>
<td>2500</td>
<td>2500</td>
<td>2500</td>
</tr>
<tr>
<td>Condensate drain K</td>
<td>315</td>
<td>315</td>
<td>400</td>
<td>500</td>
<td>500</td>
</tr>
</tbody>
</table>

#### Connection ports
- Round duct diameter D ²
  - mm: 315, 315, 400, 500
- Rectangular duct Y X ²
  - mm: 315x315, 315x400, 400x400, 500x500, 500x630

### ROOFTOP TYPE

**FLAT POSITION ONLY** (only DUPLEX-NS 1500 – 4500)

<table>
<thead>
<tr>
<th>PORT CONFIGURATION</th>
<th>1500</th>
<th>2200</th>
<th>3100</th>
<th>4500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance A (mm)</td>
<td>1310</td>
<td>1390</td>
<td>1540</td>
<td>1540</td>
</tr>
<tr>
<td>Distance B (mm)</td>
<td>475</td>
<td>605</td>
<td>690</td>
<td>910</td>
</tr>
<tr>
<td>Length L0 (mm)</td>
<td>1960</td>
<td>2160</td>
<td>2240</td>
<td>2240</td>
</tr>
<tr>
<td>Length L1/L2 (mm)</td>
<td>2200</td>
<td>2340</td>
<td>2540</td>
<td>2540</td>
</tr>
<tr>
<td>Condensate drain K</td>
<td>315</td>
<td>315</td>
<td>400</td>
<td>500</td>
</tr>
</tbody>
</table>

#### Connection ports
- Round duct diameter D ²
  - mm: 315, 315, 400, 500
- Rectangular duct Y X ²
  - mm: 315x315, 315x400, 400x400, 500x500, 500x630

### ROUND PORTS

- **Basic port** (inlet, outlet)
- **Port with a damper** (inlet only)
- **Port with a flexible connection** (max. Length) (inlet, outlet)

### RECTANGULAR PORTS

- **Basic port** (inlet, outlet)
- **Port with a damper** (inlet only)
- **Port with a damper and flexible connection** (inlet only)

---

¹¹) standard sizes of round and rectangular ports, others as option (for allowable airflow speed)
²) only rectangular ports
When installing DUPLEX-S units it is necessary to allow for recommended free manipulation space around the unit. Minimum space of 150 mm is needed under a unit to install a DN 32 condensate drain pipe. A trap of minimum height of 150 mm must be installed before connecting the pipe to a building sewer. The recommended space is easily ensured when delivered standard support steel legs are used.

Unit front service space is needed for opening access door, filter removal and access to all components for maintenance.

Each individual drawing shows the minimum manipulation distance when hinged door is used (easier access), and minimum manipulation space for hingeless door, with quick locks (more difficult access).

For all units a minimum 600 mm of manipulation space must be left on side where an electrical control panel is located according. For units equipped with a heating or cooling hydraulic kit a free space on side of the kit must be left.
**DUPLEX, DUPLEX-S, DUPLEX-N**

**Basic Configuration**

The compact unit consists of supply and exhaust centrifugal fans with electric motors in anti-vibration mounting, removable cross-flow air-to-air heat recovery core assembled from thin plastic plates, removable G4 (or F7) supply and exhaust air filters, and a condensate pan with DN 32 flexible hose. The unit casing consists of steel frame and sandwich side panels made of painted aluminum sheets and filled with 22 mm of polyurethane insulation with thermal resistance $R = 1.05 \text{ m}^2\text{K/W}$, (roof units with insulation of 45 mm). The sandwich panels are fixed to the frame. A front door enables easy access to all built-in components and filters.

**Fans**

Variety of fan types of different manufacturers can be used for each DUPLEX unit size. Fans differ in volume flow rate, available pressure, speed, sound level and power consumption. Single-phase, three-phase or special EC (DC) energy-saving fans are available. All fans are direct-driven.

**Air-to-air heat recovery exchanger**

Several heat recovery core types (e.g. K750.F, K750.G) with different heat recovery efficiency and pressure drop are available for any unit size.

---

**DUPLEX, DUPLEX-S – BASIC CONFIGURATION**

**Basic configuration**

The compact unit consists of supply and exhaust centrifugal fans with electric motors in anti-vibration mounting, removable cross-flow air-to-air heat recovery core assembled from thin plastic plates, removable G4 (or F7) supply and exhaust air filters, and a condensate pan with DN 32 flexible hose. The unit casing consists of steel frame and sandwich side panels made of painted aluminum sheets and filled with 22 mm of polyurethane insulation with thermal resistance $R = 1.05 \text{ m}^2\text{K/W}$, (roof units with insulation of 45 mm). The sandwich panels are fixed to the frame. A front door enables easy access to all built-in components and filters.

**Fans**

Variety of fan types of different manufacturers can be used for each DUPLEX unit size. Fans differ in volume flow rate, available pressure, speed, sound level and power consumption. Single-phase, three-phase or special EC (DC) energy-saving fans are available. All fans are direct-driven.

**Air-to-air heat recovery exchanger**

Several heat recovery core types (e.g. K750.F, K750.G) with different heat recovery efficiency and pressure drop are available for any unit size.

---

**DUPLEX, DUPLEX-S – DESCRIPTION OF ACCESSORIES**

**By-pass ("B")**

By-pass of the plate heat recovery core on supply air side. By-pass consists of an opposed-blade damper and an actuator:

- It is fitted next to the recovery core inside the unit; it does not increase size of the unit.
- The standard actuator is BELIMO 230 V; other types are available upon request.

**Mixing damper ("C")**

Built-in opposed-blade damper including BELIMO 230 V actuator. It enables to mix fresh and stale (internal) air in 0 to 100 % range. Along with a mixing damper the e, shutoff damper without spring-return function must always be installed. Should the unit be equipped with a heating coil (DUPLEX-T-C) and draft could occur in the duct system during power failure with the damper stuck open, it is necessary to install separate shutoff damper with spring-return function into the duct close to an air intake. The damper is controlled by the unit control.

**Hot water heating coil ("T")**

Built-in water-to-air three-row (possibly five-row) heating coil; made of copper pipes and aluminum fins. Designed for systems up to 110 °C and 1.0 MPa. The coil is standardly equipped with flexible connection and a steam-gas capillary thermostat for freeze protection. Units in modification T (with heating coil) must be equipped with e, supply air shutoff damper; an actuator with spring-return function (BELIMO LF 230 V) is recommended. A coil hydraulic kit for heating capacity control of R-TPO, R-TPO-3 or RSTPO type can be supplied with the coil upon request. Attention - the coil of rooftop units must always be protected against freezing by a water-glycol mixture.

**Provision for cooling ("CHP")**

Provision for additional installation of cooling coil. This provision comprises space for the cooling coil and the condensate pan. Attention - in case of additional cooling coil installation it is necessary to secure safe access and a sufficient manipulation space. A ceilingsuspended unit must be taken down to install the coil. Additional coil installation is only possible for floor-standing horizontal and flat, ceiling-suspended, and rooftop configurations. Units in configuration CHP without a heating coil in position 30 to 43 and all rooftop units must be equipped with a droplet eliminator; dimension L2 applies to the units.

**Direct expansion (DX) coil ("CHF")**

A built-in coil made of copper pipes and aluminum fins, including a condensate drain and a pressure switch for freeze alarm. Three- or five-row coils are chosen depending on capacity required, refrigerant type and air parameters. The DX coil can be equipped with accessories on request.

Attention - units with the cooling coil are only made in floor-standing horizontal and flat, ceiling-suspended, and rooftop configurations. Units in configuration CHF without a heating coil in position 30 to 43 and all rooftop units must be equipped with a droplet eliminator; dimension L2 applies to the units.

**Chilled water cooling coil ("CHW")**

A built-in coil made of copper pipes and aluminum fins, including a condensate drain and individual condensate drainage. Three- or five-row coils are chosen depending on capacity required, cooling medium type and air parameters. The cooling coil can be equipped with the R-CHW hydraulic kit on request.

Attention - units with the cooling coil are only made in floor-standing horizontal and flat, ceiling-suspended, and rooftop configurations. Units in configuration CHF without a heating coil in position 30 to 43 and all rooftop units must be equipped with a droplet eliminator; dimension L2 applies to the units.
Shutoff damper e.; i.
Shutoff dampers standardly fitted with BELIMO actuators are located in the air inlet port.
The following damper types are available:
- fresh air damper e., - mandatory for C modification [with mixing damper]
- fresh damper e., LF - mandatory for T modification [with heating coil]
- exhaust air damper i.,

Heating coil hydraulic kit
Its function is to control heating capacity of a heating coil. It consists of a three-speed pump,
two globe shutoff valves and connection pipes.
Further equipment depends on the type:
- RTPO-4 – four-way mixing valve with an actuator for digital control system
- RTPO-3 – three-way mixing valve with an actuator for digital control system
- RS-TPO – three-way diverting valve with a thermostatic valve for electric control system

Double insulation
It is possible to increase polyurethane insulation to 45 mm thickness (R = 2.1 m²KW⁻¹). Then
outer dimensions of the unit are 40 mm larger in all directions compared to catalogue dimensional data.

Delivery of diassembled unit
All units can be delivered dismantled on request. The unit is to be assembled by rivets and bolts
directly on site, therefore the unit can be installed in inaccessible location.

Sound attenuators (DUPLEX-N)
For rooftop units only. The inlet e., and outlet e., extension can be fitted with a built-in attenuator.

Cooling coil hydraulic kit
Its function is to control cooling capacity of a chilled-water cooling coil. It always consists of
two globe shutoff valves and connection pipes. Further equipment depends on the type:
- R-CHW-3 – three-way mixing valve with an actuator and a three-speed pump for digital control system
- R-CHW-2 – throttling valve with an actuator for digital control system

Flexible connections
Round and rectangular ports can be equipped with flexible connections upon request.

Hingeless doors
When needed it is possible to deliver door without standard hinges, only with quick lockes or spring fasteners - than necessary manipulation space is reduced.

Spare filter textiles (NFT)
Spare filter textiles in sizes depending on unit type. They are available in the filtration of G4 and F7 class.

Hot water heating coil (TP0)
Separately supplied coil for installation into round duct. It is suitable for cramped locations, where it is impossible to put the coil inside the unit, as well as for rooftop units. The coil is standardly equipment with the steam-gas capillary thermostat.

Electric heating coil (EPO)
Separately supplied heating coil to be fitted into round duct. Capacities and diameters can be found in respective catalogue sheets. The EPO heating coils are controlled by their own control system located directly in the coil housing.

Accessories for DX coil
It is possible to equip the DX coils with refrigeration circle components: expansion valve with nozzle (A), solenoid valve (B, C), sight glass (D), filter-drier (E), eventually with evaporating pressure controller.

Air filtration
All DUPLEX units can be equipped with supply air filtration of F7 class instead of standard G4 class. Pressure drop of the filter is then 50 to 100 Pa [clean filter] depending on air flow rate, unit type and dirt accumulated. Prefilters made of multilayer pulled metal can be supplied.

Flexible connections
Round and rectangular ports can be equipped with flexible connections upon request.

Polarisation filters
Additional supply air filter (DYNAMIC), including 24 V transformer and spare filter textile. For pressure drop data see respective graphs.
### DUPLEX, DUPLEX-S, DUPLEX-N

Control systems

DUPLEX units are delivered with basic control components or with complete control systems. There are three types of control systems available [electric, digital and control for kitchens] according to customer needs and an application. The systems also include variety of sensors (temperature, humidity, air quality, CO₂) for effective operation control.

#### Features of the control systems
- Selection of the most suitable and efficient control system at the lowest cost, depending on the particular application
- Control system is integrated with the unit, most components are already wired and checked in factory, thus reducing the risk of incorrect wiring
- No control system project documentation is necessary for standard cases, standardized solutions can be used
- Simple wiring, system simplicity, error indication
- Qualified technical support and consulting

#### SUMMARY OF DUPLEX CONTROL SYSTEMS

<table>
<thead>
<tr>
<th>Type</th>
<th>Characteristics</th>
<th>Use</th>
<th>Simplified diagrams of electrical wiring</th>
</tr>
</thead>
</table>
| A – basic | - All electrical components are wired to a junction box terminal strip inside or outside the unit  
- Standard components are fans, damper actuators, capillary freeze protection thermostat of hot water heating coil  
- More components is included upon customer’s request (exact actuator type, sensors, thermostats, pressure switches etc.) | - Suitable for applications with separate delivery of control system; e.g. large buildings with central control system etc. | ![Basic Control System Diagram](https://via.placeholder.com/150) |
| B – electric | - Simple system  
- Two-speed fan control (MIN, MAX) (exact volume flow rate can individually be set for each fan during commissioning)  
- On/off control of by-pass and mixing damper  
- On/off remote control of heating coil: temperature is set on the thermostat valve of hot water coil or directly on the electric coil | - Electric system is suitable for simple applications [e.g. ventilation of locker rooms, gyms, restaurants etc.]  
- It cannot be used for units with cooling coil  
- It is recommended for applications with air reheat only (not for warm-air heating) | ![Electric Control System Diagram](https://via.placeholder.com/150) |
| C – digital | - Comfort system developed specially for the DUPLEX units  
- Seven-speed fan control (optionally four-speed)  
- Temperature remote control downstream of the heating coil  
- Possible control of room temperature  
- Choice of water or DX cooling coil  
- Temperature-dependent modulating automatic control of bypass damper  
- Modulating control of mixing damper  
- Unified system of low-voltage wiring of all components | - Ideal for comfort applications including warm air heating and cooling  
- Possibility to program weekly schedule (KP O1 series)  
- Simple manual controllers (R series)  
- Possibility to link with supervisory system via standard analogue transmitters  
- Possible use of transmitters for other functions [e.g. constant pressure / volume flow control], control based on air quality or room humidity etc. | ![Digital Control System Diagram](https://via.placeholder.com/150) |
| D – for kitchens | - Control system designed specially for effective control of kitchens  
- Consist of SM microprocessor module fitted into kitchen hood or ventilation ceiling, OP control panel and RG junction box  
- Control principle consists of automatic setting of volume flow rate depending on heat production of kitchen appliances [i.e. difference of temperatures under the kitchen hood and in the space] | - Suitable for kitchens of all types and sizes equipped with kitchen hoods of all types (e.g. DINER, VARIANT, STANDARD) or by ventilation ceilings (SKV)  
- Hot water or electric heating coil control according to supply air temperature (OP-T)  
- By-pass control summer / winter operation (OP-T-BP) | ![Kitchen Control System Diagram](https://via.placeholder.com/150) |
**DUPLEX, DUPLEX-S, DUPLEX-N, DUPLEX-NS**

**Installation configuration**

DUPLEX 2000 to 15000 series [with crossflow heat exchanger] and the DUPLEX-S 1500 to 5600 series [with counterflow heat exchanger] are available in many installation configurations. This simplifies their mechanical-room installation, increasing the possibility of placing DUPLEX units into a cramped space. Due to design reasons and to ensure good condensate drainage not all unit sizes and positions are available in all port configurations (see notes for the individual installation configurations).

This documentation includes a list of all available installation configurations for the indoor DUPLEX and DUPLEX-S units and the rooftop DUPLEX-N and DUPLEX-NS units.

---

**INDOOR UNITS**

**FLOOR-STANDING HORIZONTAL POSITION**

- Position 10, 11 (DUPLEX 2000 – 8000, DUPLEX-S 1500 – 5600) – Access door side view
- Position 12, 13 (DUPLEX 2000 – 15000, DUPLEX-S 1500 – 5600) – Access door side view

**FLOOR-STANDING VERTICAL POSITION**

- Position 20 – 23 (DUPLEX 2000 – 8000, DUPLEX-S 1500 – 5600) – Access door side view
- (not possible in CHF, CHW modification)

**CEILING-SUSPENDED POSITION**

- Position 30 – 33 (DUPLEX 2000 – 6000, DUPLEX-S 1500 – 5600) – Top view

**FLOOR-STANDING FLAT POSITION**

- Position 40 – 43 (DUPLEX 2000 – 8000, DUPLEX-S 1500 – 5600) – Top view

---

**ROOFTOP UNITS**

**HORIZONTAL POSITION**

- Position 1/0 – 1/2 and 2/0 – 2/2 (DUPLEX-N 2000 – 15000) – Access door side view

**FLAT POSITION**

PORT CONFIGURATION - INDOOR VERSION

FLOOR-STANDING HORIZONTAL POSITION

Configuration 10/0 - 13/6
Access door side view

- DUPLEX 2000, 3000, 4000, 6000, 8000
- DUPLEX 15000 (except)
- DUPLEX-S 1500, 2200, 3100, 4500, 5600

10/0

10/2

10/8

10/10

impossible
D 15000

11/0

11/2

11/8

11/10

impossible
D 15000

12/0

12/2

12/4

12/6

impossible
D 15000

13/0

13/2

13/4

13/6

impossible
D 15000

LEGEND

- e₁ ... fresh outside air intake
- e₂ ... supply of filtered fresh air
- i₁ ... condensate drain location
- i₂ ... control panel (switch box)
  (different location possible upon request)
- alt. ... control panel (various location)
- i₃ ... stale air intake
- i₄ ... stale air exhaust
- x ... hot water (T) and chilled water (CHF, CHW) connection
- x ... DUPLEX with crossflow heat recovery core
- x ... DUPLEX-S with counterflow heat recovery core
- x ... possible and prohibited configurations
FLOOR-STANDING VERTICAL POSITION

Configuration 20/6 – 23/15
Access door side view
The vertical units cannot be equipped with cooling coil

**DUPLEX** 2000, 3000, 4000, 6000, 8000
**DUPLEX-S** 1500, 2200, 3100, 4500, 5600

**LEGEND**
- $e_1$ ... fresh outside air intake
- $e_2$ ... supply of filtered fresh air
- $i_1$ ... stale air intake
- $i_2$ ... stale air exhaust
- $i$ ... condensate drain location
- $i$ ... hot water (T) and chilled water (CHF, CHW) connection
- $\checkmark$ ... DUPLEX with crossflow heat recovery core
- $\times$ ... DUPLEX-S with counterflow heat recovery core

Possible and prohibited configurations
CEILING-SUSPENDED POSITION
Configuration 30/0 – 30/15
Top view

- DUPLEX 2000, 3000, 4000, 6000
- DUPLEX-S 1500, 2200, 3100, 4500

LEGEND

- e1 ... fresh outside air intake
- e2 ... supply of filtered fresh air
- i1 ... condensate drain location
- i2 ... control panel (switch box) (different location possible upon request)
- i3 ... control panel (various location)
- i4 ... stale air intake
- i5 ... stale air exhaust
- i6 ... hot water (T) and chilled water (CHF, CHW) connection
- i7 ... DUPLEX with crossflow heat recovery core
- i8 ... DUPLEX-S with counterflow heat recovery core
- 5 ... possible and prohibited configurations
CEILING-SUSPENDED POSITION

Configuration 31/0 – 31/15
Top view

**DUPLEX 2000, 3000, 4000, 6000**

**DUPLEX-S 1500, 2200, 3100, 4500**

**LEGEND**

- $e_1$  ... fresh outside air intake
- $e_2$  ... supply of filtered fresh air
- $i_1$  ... stale air intake
- $i_2$  ... stale air exhaust
-  ... condensate drain location
-  ... hot water (T) and chilled water (CHF, CHW) connection
-  ... DUPLEX with crossflow heat recovery core
-  ... DUPLEX-S with counterflow heat recovery core
-  ... possible and prohibited configurations

**PORT CONFIGURATION – INDOOR VERSION**

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CEILING-SUSPENDED POSITION

Configuration 32/0 – 32/15
Top view

DUPLEX 2000, 3000, 4000, 6000

PORT CONFIGURATION – INDOOR VERSION

LEGEND

- fresh outside air intake
- supply of filtered fresh air
- condensate drain location
- control panel (switch box)
  (different location possible upon request)
- control panel (various location)
- stale air intake
- stale air exhaust
- hot water (T) and chilled water (CHF, CHW) connection
- DUPLEX with crossflow heat recovery core
- DUPLEX-S with counterflow heat recovery core
- possible and prohibited configurations
PORT CONFIGURATION - INDOOR VERSION

CEILING-SUSPENDED POSITION

Configuration 33/0 – 33/15
Top view

DULEX 2000, 3000, 4000, 6000

LEGEND

- **e**₁ ... fresh outside air intake
- **e**₂ ... supply of filtered fresh air
- **i**₁ ... condensate drain location
- **i**₂ ... control panel (switch box)
  (different location possible upon request)
- **i**₃ ... control panel (various location)
- **i**₄ ... stale air intake
- **i**₅ ... stale air exhaust
- **κ** ... hot water (T) and chilled water (CHF, CHW) connection
- **κ** ... DUPLEX with crossflow heat recovery core
- **κ** ... DUPLEX-S with counterflow heat recovery core
  - possible and prohibited configurations
PORT CONFIGURATION – INDOOR VERSION

FLOOR-STANDING FLAT POSITION

Configuration 40/0 – 40/15
Top view

- DUPLEX 2000, 3000, 4000, 6000
- DUPLEX-S 1500, 2200, 3100, 4500

LEGEND

- e1 ... fresh outside air intake
- e2 ... supply of filtered fresh air
- ... condensate drain location
- ... control panel (switch box)
  (different location possible upon request)
- ... control panel (various location)
- i1 ... stale air intake
- i2 ... stale air exhaust
- i5 ... hot water (T) and chilled water (CHF, CHW) connection
- e ... DUPLEX with crossflow heat recovery core
- e ... DUPLEX-S with counterflow heat recovery core
  – possible and prohibited configurations
FLOOR-STANDING FLAT POSITION

Configuration 41/0 – 41/15
Top view

DUPLEX 2000, 3000, 4000, 6000
DUPLEX-S 1500, 2200, 3100, 4500

PORT CONFIGURATION – INDOOR VERSION

DUPLEX 2000, 3000, 4000, 6000
DUPLEX-S 1500, 2200, 3100, 4500

LEGEND

- fresh outside air intake
- supply of filtered fresh air
- condensate drain location
- control panel [switch box]
  (different location possible upon request)
- control panel [various location]
- stale air intake
- stale air exhaust
- hot water [T] and chilled water [CHF, CHW] connection
- DUPLEX with crossflow heat recovery core
- DUPLEX-S with counterflow heat recovery core
- possible and prohibited configurations
**FLOOR-STANDING FLAT POSITION**

**Configuration 42/0 – 42/15**

*Top view*

**DUPLEX 2000, 3000, 4000, 6000**

**Legend**

- **e₁** ... fresh outside air intake
- **e₂** ... supply of filtered fresh air
- **i₁** ... condensate drain location
- **i₂** ... control panel (switch box)
  (different location possible upon request)
- **i₃** ... control panel (various location)
- **i₄** ... stale air intake
- **i₅** ... stale air exhaust
- **i₆** ... hot water (T) and chilled water (CHF, CHW) connection
- **i₇** ... DUPLEX with crossflow heat recovery core
- **i₈** ... DUPLEX-S with counterflow heat recovery core
  - possible and prohibited configurations
FLOOR-STANDING FLAT POSITION

Configuration 43/0 – 43/15
Top view

- DUPLEX 2000, 3000, 4000, 6000

LEGEND

- fresh outside air intake
- supply of filtered fresh air
- condensate drain location
- control panel (switch box) (different location possible upon request)
- control panel (various location)
- stale air intake
- stale air exhaust
- hot water [T] and chilled water [CHF, CHW] connection
- DUPLEX with crossflow heat recovery core
- DUPLEX-S with counterflow heat recovery core – possible and prohibited configurations
**ROOFTOP VERSION – HORIZONTAL**

Configuration 1/0 ÷ 1/3; 2/0 ÷ 2/3

(DUPLEX-N 2000, 3000, 4000, 6000, 8000, 15000)

**ROOFTOP VERSION – FLAT**

Configuration 3/8 ÷ 3/14; 4/8 ÷ 4/14

(DUPLEX-N 2000, 3000, 4000, 6000)

(DUPLEX-NS 1500, 2200, 3100, 4500)

*Note:* Hoods of air intake and exhaust can optionally be replaced with round or rectangular ports for all rooftop version.