Model FED 56 | Drying and heating chambers with forced convection and enhanced timer functions

BINDER heating chambers of the FED Avantgarde.Line series provide almost unlimited capacity and are particularly adaptable. With advanced timing functions and a controllable fan, temperature and convection conditions are easily controlled.

**BENEFITS**

- Best energy efficiency on the market
- Excellent temporal and spatial temperature accuracy
- USB connection for recording data
- Temperature range up to 300 °C

**MAIN FEATURES**

- Temperature range: ambient temperature plus 10 °C to 300 °C
- Up to 30% lower energy consumption compared to conventional units on the market
- High temperature accuracy thanks to APT.line™ technology
- Adjustable fan speed
- Controller with LCD display and enhanced time functions
- Electromechanical control of the exhaust air flap
- 2 chrome-plated racks
- Stackable
- Class 2 integrated independent adjustable temperature safety device (DIN 12880) with visual alarm
- Ergonomic handle design
- Ethernet interface
- USB port for recording data

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>230 V 1~ ph 50/60 Hz</td>
<td>Standard</td>
<td>FED056-230V</td>
<td>9010-0295</td>
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<tr>
<td></td>
<td>120 V 1~ ph 60 Hz</td>
<td>Standard</td>
<td>FED056UL-120V</td>
<td>9010-0296</td>
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</table>
## TECHNICAL DATA

<table>
<thead>
<tr>
<th>Description</th>
<th>FED056-230V³</th>
<th>FED056UL-120V³</th>
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<tbody>
<tr>
<td><strong>Article Number</strong></td>
<td>9010-0295</td>
<td>9010-0296</td>
</tr>
<tr>
<td><strong>Performance Data Temperature</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature range +10 °C above ambient temperature to [°C]</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Temperature variation at 150 °C [± K]</td>
<td>1.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Temperature fluctuation at 150 °C [± K]</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Heating-up time to 150 °C [min]</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Recovery time after 30 seconds door open at 150 °C [min]</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Electrical data</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated Voltage [V]</td>
<td>230</td>
<td>120</td>
</tr>
<tr>
<td>Power frequency [Hz]</td>
<td>50/60</td>
<td>60</td>
</tr>
<tr>
<td>Nominal power [kW]</td>
<td>1.1</td>
<td>1.2</td>
</tr>
<tr>
<td>Unit fuse [A]</td>
<td>6.3</td>
<td>12.5</td>
</tr>
<tr>
<td>Phase (Nominal voltage)</td>
<td>1~</td>
<td>1~</td>
</tr>
<tr>
<td><strong>Measures</strong></td>
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<td></td>
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<tr>
<td>Interior volume [L]</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Net weight of the unit (empty) [kg]</td>
<td>41</td>
<td>41</td>
</tr>
<tr>
<td>Permitted load [kg]</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Load per rack [kg]</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Wall clearance back [mm]</td>
<td>160</td>
<td>160</td>
</tr>
<tr>
<td>Wall clearance sidewise [mm]</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td><strong>Internal Dimensions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width [mm]</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>Height [mm]</td>
<td>440</td>
<td>440</td>
</tr>
<tr>
<td>Depth [mm]</td>
<td>345</td>
<td>345</td>
</tr>
<tr>
<td><strong>Doors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit doors</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Housing dimensions not incl. fittings and connections</strong></td>
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<td></td>
</tr>
<tr>
<td>Width net [mm]</td>
<td>560</td>
<td>560</td>
</tr>
<tr>
<td>Height net [mm]</td>
<td>625</td>
<td>625</td>
</tr>
<tr>
<td>Depth net [mm]</td>
<td>565</td>
<td>565</td>
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<tr>
<td><strong>Environment-specific data</strong></td>
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<td></td>
</tr>
<tr>
<td>Energy consumption at 150 °C [Wh/h]</td>
<td>290</td>
<td>290</td>
</tr>
<tr>
<td>Sound-pressure level [dB(A)]</td>
<td>43</td>
<td>43</td>
</tr>
<tr>
<td><strong>Fixtures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of shelves (std./max.)</td>
<td>2/4</td>
<td>2/4</td>
</tr>
</tbody>
</table>

1 All technical data is specified for unloaded units with standard equipment at an ambient temperature of +22 °C ±3 °C and a power supply voltage fluctuation of ±10 %. The temperature data is determined to BINDER factory standard following DIN 12880, observing the recommended wall clearances of 10 % of the height, width, and depth of the inner chamber. Technical data refers to 100 % fan speed. All indications are average values, typical for units produced in series. We reserve the right to change technical specifications at any time.

## DIMENSIONS incl. fittings and connections [mm]

![Diagram of dimensions](image)
<table>
<thead>
<tr>
<th>Designation</th>
<th>Description</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>left</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 mm</td>
<td>8012-1278</td>
<td>01</td>
</tr>
<tr>
<td>30 mm</td>
<td>8012-1655</td>
<td>01</td>
</tr>
<tr>
<td>50 mm</td>
<td>8012-1657</td>
<td>01</td>
</tr>
<tr>
<td><strong>right</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 mm</td>
<td>8012-1271</td>
<td>01</td>
</tr>
<tr>
<td>30 mm</td>
<td>8012-1654</td>
<td>01</td>
</tr>
<tr>
<td>50 mm</td>
<td>8012-1656</td>
<td>01</td>
</tr>
<tr>
<td><strong>top</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 mm</td>
<td>8012-1264</td>
<td>01</td>
</tr>
<tr>
<td>30 mm</td>
<td>8012-1365</td>
<td>01</td>
</tr>
<tr>
<td>50 mm</td>
<td>8012-1381</td>
<td>01</td>
</tr>
<tr>
<td>100 mm</td>
<td>8012-1672</td>
<td>01, 10</td>
</tr>
<tr>
<td><strong>Access port with silicone plug</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Alarm function for overheating</strong></td>
<td>Switchable acoustic alarm, with adjustable limit value on the independent temperature safety device</td>
<td>– 8012-1657</td>
</tr>
<tr>
<td><strong>Analog output 4-20 mA</strong></td>
<td>for temperature values (output not adjustable)</td>
<td>02 8012-1625</td>
</tr>
<tr>
<td><strong>Calibration certificate, expanded</strong></td>
<td>for temperature; for extending the measurement in center of chamber to include another test temperature</td>
<td>– 8012-1118</td>
</tr>
<tr>
<td><strong>Calibration certificate, temperature</strong></td>
<td>for temperature, measurement in center of chamber at specified temperature</td>
<td>– 8012-1137</td>
</tr>
<tr>
<td></td>
<td>temperature measurement incl. certificate and 27 measuring points at specified temperature</td>
<td>– 8012-1596</td>
</tr>
<tr>
<td></td>
<td>temperature measurement incl. certificate, 15-18 measuring points at specified temperature</td>
<td>– 8012-1575</td>
</tr>
<tr>
<td></td>
<td>temperature measurement incl. certificate, 9 measuring points at specified temperature</td>
<td>– 8012-1554</td>
</tr>
<tr>
<td><strong>Class 3.1 independent temperature safety device</strong></td>
<td>with visual alarm (DIN 12880)</td>
<td>04, 12 8012-1644</td>
</tr>
<tr>
<td><strong>Clock</strong></td>
<td>battery-backed</td>
<td>– 8012-1642</td>
</tr>
<tr>
<td><strong>Door gasket</strong></td>
<td>made of FKM, silicone-free</td>
<td>03 8012-1649</td>
</tr>
<tr>
<td><strong>Door lock</strong></td>
<td>lockable door handle</td>
<td>– 8012-1666</td>
</tr>
<tr>
<td><strong>Gas-tight option model</strong></td>
<td>Incl. additional measures for the greatest possible impermeability to gas; not in conjunction with access port or interior lighting option</td>
<td>09 8012-1684</td>
</tr>
<tr>
<td><strong>Heating output, reinforced</strong></td>
<td>For faster heating up time and improved recovery time; max. 300 °C; not in conjunction with load management option 120/230 V option model</td>
<td>– 8012-1698</td>
</tr>
<tr>
<td><strong>HEPA air filter</strong></td>
<td>On fresh air supply for unit; filter classification F14 (acc. to EN 1822-1:2009, &gt; 99.995% at 0.3 µm)</td>
<td>– 8012-1695</td>
</tr>
<tr>
<td><strong>Inert gas connection</strong></td>
<td>With gas inlet and outlet, Ø 10 mm, incl. additional measures for the greatest possible impermeability to gas; not in conjunction with access port or interior lighting option</td>
<td>– 8012-1690</td>
</tr>
<tr>
<td><strong>Inner chamber, reinforced</strong></td>
<td>max. total load 85 kg</td>
<td>– 8012-1713</td>
</tr>
<tr>
<td><strong>Interior lighting</strong></td>
<td>with 15 W light bulb</td>
<td>– 8012-1629</td>
</tr>
<tr>
<td></td>
<td>120 V option model</td>
<td>– 8012-1633</td>
</tr>
<tr>
<td></td>
<td>230/240 V option model</td>
<td>– 8012-1701</td>
</tr>
<tr>
<td><strong>Measurement of air exchange rate</strong></td>
<td>in accordance with ASTM D5374, definition and protocol according to ambient temperature</td>
<td>– 8012-1197</td>
</tr>
<tr>
<td><strong>Pt 100 temperature sensor</strong></td>
<td>additional flexible Pt 100, interior, for displaying the temperature on the unit display</td>
<td>– 8012-1621</td>
</tr>
<tr>
<td><strong>Viewing window and interior lighting</strong></td>
<td>viewing window (triple insulating glass) in door, 240 x 240 mm, and 15 W interior 120 V option model</td>
<td>– 8012-1703</td>
</tr>
<tr>
<td></td>
<td>230 V option model</td>
<td>– 8012-1701</td>
</tr>
</tbody>
</table>

* Notes › See last page
ACCESSORIES

Designation | Description | Art.-No.
---|---|---
APT-COM™ 4 BASIC-Edition | for simple logging and documentation requirements with up to 5 networked units. version 4, BASIC edition | 9053-0039
APT-COM™ 4 GLP-Edition | for working under GLP-compliant conditions. Measured values are documented in a tamper-proof way in line with the requirements of FDA Regulation 21 CFR 11. version 4, GLP edition | 9053-0042
APT-COM™ 4 PROFESSIONAL-Edition | convenient unit and user management built on the BASIC edition. Suitable for networking up to 100 units. version 4, PROFESSIONAL edition | 9053-0040
Data Logger Kit | T 350: For continuous temperature logging from 0 °C to 350 °C; kit includes 1 data logger, Pt 100 sensor with 2 m extension cable and 1 magnetic fixture for mounting to the BINDER unit | 8012-0714
Data Logger Software | LOG ANALYZE software kit, configuration and evaluation software for all BINDER Data Logger Kits (incl. USB data cable) | 8012-0821
Instrument tray | with lid made from 18/8 stainless steel, stackable, dimensions: 230 x 133 x 45 mm | 4022-0123
| with lid made from 18/8 stainless steel, stackable, dimensions: 315 x 215 x 60 mm | 4022-0124
pH-neutral detergent | concentrated, for gentle remove of residual contaminants; 1 kg | 1002-0016

Qualification documents

Designation | Description | Art.-No.
---|---|---
IQ/OQ documents – supporting documents for validation performed by customers, consisting of: IQ/OQ checklists incl. calibration guide and comprehensive unit documentation; parameters: temperature, CO₂, O₂, pressure, depending on unit | 7057-0001
| Digital in PDF format | –
| Hard copy inside folder | –

IQ/OQ/PQ documents – supporting documents for validation performed by customers, according to customer requirements, PQ section added to qualification folder IQ/OQ; parameters: temperature, CO₂, O₂ – or pressure, depending on unit | 7057-0005
| Digital in PDF format | –
| Hard copy inside folder | –

Rack

Designation | Description | Art.-No.
---|---|---
chrome plated | – | 6004-0166
stainless steel | – | 6004-0150

Rack, heavy load | Stainless steel, max. load per rack 50 kg | 6004-0198

Rubber pads | set anti-slip feet | 8012-1887

Shelf, perforated | Stainless steel | 6004-0182

Table on castors | stable cart, casters with locking brakes, dimensions: W 1,000 x D 800 x H 780 mm | 9051-0018

SERVICES

Designation | Description | Art.-No.
---|---|---
Installation services | | 
Unit installation | Unpacking and setting up of unit, connecting to existing connections, and checking function | DL10-0100
Unit instructions | Unit function instructions for operation and programming of the controller | DL10-0500
Preventive maintenance | | 
Maintenance | Functional testing of all electrical and mechanical components, short calibration, documentation in the maintenance schedule | DL20-0200
Calibration services | | 
Measurement of air exchange rate | including certificate (in accordance with ASTM D5374) | DL33-0000
Temperature calibration | Expansion – including certificate, each additional measuring point in center of chamber at specified test temperature | DL30-0102
| Temperature calibration with 1 measuring point in center of chamber at a specified test temperature, including certificate | DL30-0101
Temperature measurement, 18 measuring points | Temperature measurement with 18 measuring points at a specified test temperature, including certificate | DL30-0118
Temperature measurement, 27 measuring points | Temperature measurement with 27 measuring points at a specified test temperature, including certificate | DL30-0127
Temperature measurement, 9 measuring points | Temperature measurement with 9 measuring points at a specified test temperature, including certificate | DL30-0109

* Notes › See last page
<table>
<thead>
<tr>
<th>Designation</th>
<th>Description</th>
<th>*</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Validation services</td>
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<tr>
<td>Execution of IQ/QQ</td>
<td>Execution of IQ/QQ in accordance with qualification folder</td>
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<td>DL40-0100</td>
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<tr>
<td>Execution of IQ/QQ/PQ</td>
<td>Execution of IQ/QQ/PQ in accordance with qualification folder</td>
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<td>DL44-0500</td>
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<tr>
<td>Warranty service</td>
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<tr>
<td>Warranty extension from 2 to 3 years</td>
<td>The warranty is extended from 2 to 3 years from the delivery date, wear parts are excluded</td>
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<td>DL100-4041</td>
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<tr>
<td>Warranty extension from 2 to 5 years</td>
<td>The warranty is extended from 2 to 5 years from the delivery date, wear parts are excluded</td>
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<td>DL100-4042</td>
</tr>
</tbody>
</table>

* Notes › See last page
NOTES
01 Condensation may occur in the area around the access port. Access ports may be placed in custom locations for an additional charge.
02 UL mark is not granted when this option is used.
03 Heat resistant only to max. 200 °C.
04 Only available on units rated for 230 V.
05 The additional heat input may affect the temperature behavior.
06 Not in conjunction with the optional access port, door with window and interior lighting.
07 Not available on 23-liter units.
08 Only available on units rated for 230 V or 400 V.
09 Installation and connections take place at unit location; transport within the company only upon consultation.
10 We recommend a BINDER service contract to cover unit inspections, calibrations and validations.
11 OQ according to Yellow Paper = completed factory validation documentation of all OQ checklists.
12 Sensor calibration is performed in an accredited calibration laboratory.
13 Calibration is performed according to the BINDER factory standard.
14 Quoted prices do not include travel costs. Please refer to the chapter on BINDER Service for travel costs for your region. Quoted prices for services performed in Switzerland do not include a country-specific added fee (available on request).
15 For additional accessories, refer to the Process documentation chapter.