

# Model UF V 500 | Ultra-low temperature freezers with climate-neutral refrigerants

The BINDER ultra low temperature freezer ensures the safe storage of samples at -90 °C. It combines outstanding environmental friendliness with low energy consumption, convenient operation and an individual safety concept.

## BENEFITS

- Lowest energy consumption in its class
- Environmentally-friendly refrigerants R-290 and R-170
- Thermal insulation with unique long-life VIPs (vacuum insulation panels)
- Rust-proof interior made completely of stainless steel



Model



Model 500

## IMPORTANT FEATURES

- Temperature range: -90 °C to -40 °C
  - Lowest energy consumption in its class
  - Powerful cascade compressor cooling unit
  - Environmentally friendly refrigerants R-290 and R-170
  - Thermal insulation with unique long-life VIPs (vacuum insulation panels)
  - Innovative door gasket concept reduces buildup of ice
  - Ergonomic door handle
  - Rust-proof interior made completely of stainless steel
- Detachable inner doors made of stainless steel
  - 3 stainless-steel shelves providing flexible placement
  - Water cooling (depending on version)
  - Zero-voltage alarm contact for in-house alarm system
  - Internal data logger, measured values can be read out in open format via USB
  - Ethernet interface
  - 3 access ports, Ø 28 mm, rear

## ORDERING INFORMATION

| Interior volume [L] | Power supply - unit fuse     | Plug*     | Version       | Model version | Art.-No.  |
|---------------------|------------------------------|-----------|---------------|---------------|-----------|
| Model UF V 500      |                              |           |               |               |           |
| 501                 | 115 V 1~ 60 Hz -15,0 A       | NEMA 5-15 | Standard      | UFV500UL-120V | 9020-0351 |
|                     | 208...230 V 2~ 60 Hz -10,0 A | NEMA 6-15 | Standard      | UFV500UL-240V | 9020-0353 |
|                     | 230 V 1~ 50 Hz -10,0 A       | CEE 7/7   | Standard      | UFV500-230V   | 9020-0347 |
|                     |                              |           | Water cooling | UFV500-230V-W | 9020-0349 |

## TECHNICAL DATA

| Data                                                  |              |               |               |               |
|-------------------------------------------------------|--------------|---------------|---------------|---------------|
| Designation                                           | UFV500-230V  | UFV500-230V-W | UFV500UL-240V | UFV500UL-120V |
| Article Number                                        | 9020-0347    | 9020-0349     | 9020-0353     | 9020-0351     |
| Option model                                          | Standard     | Water cooling | Standard      | Standard      |
| Performance Data Temperature                          |              |               |               |               |
| Temperature range                                     | -90...-40 °C | -90...-40 °C  | -90...-40 °C  | -90...-40 °C  |
| Temperature uniformity at -80°C                       | 2,5 ± K      | 2,5 ± K       | 2,5 ± K       | 2,5 ± K       |
| Temperature fluctuation at -80°C                      | 1,5 ± K      | 1,5 ± K       | 1,5 ± K       | 1,5 ± K       |
| Cooling down time from 22°C to -80°C                  | 360 min      | 360 min       | 360 min       | 360 min       |
| Electrical data                                       |              |               |               |               |
| Rated Voltage                                         | 230 V        | 230 V         | 208...230 V   | 115 V         |
| Power frequency                                       | 50 Hz        | 50 Hz         | 60 Hz         | 60 Hz         |
| Nominal power                                         | 1,6 kW       | 1,6 kW        | 1,8 kW        | 1,4 kW        |
| Unit fuse                                             | 10,0 A       | 10,0 A        | 10,0 A        | 15,0 A        |
| Phase (Nominal voltage)                               | 1~           | 1~            | 2~            | 1~            |
| Dimensions and weights                                |              |               |               |               |
| Interior volume                                       | 501 L        | 501 L         | 501 L         | 501 L         |
| Net weight of the unit (empty)                        | 247 kg       | 247 kg        | 247 kg        | 247 kg        |
| Permitted load of individual compartment              | 50 kg        | 50 kg         | 50 kg         | 50 kg         |
| Permitted load                                        | 200 kg       | 200 kg        | 200 kg        | 200 kg        |
| Wall clearance back                                   | 100 mm       | 100 mm        | 100 mm        | 100 mm        |
| Wall clearance sidewise                               | 250 mm       | 250 mm        | 250 mm        | 250 mm        |
| Housing dimensions not incl. fittings and connections |              |               |               |               |
| Width net                                             | 826 mm       | 826 mm        | 826 mm        | 826 mm        |
| Height net                                            | 1,966 mm     | 1,966 mm      | 1,966 mm      | 1,966 mm      |
| Depth net                                             | 938 mm       | 938 mm        | 938 mm        | 938 mm        |
| Internal Dimensions                                   |              |               |               |               |
| Interior width                                        | 606 mm       | 606 mm        | 606 mm        | 606 mm        |
| Interior height                                       | 1,300 mm     | 1,300 mm      | 1,300 mm      | 1,300 mm      |

|                |        |        |        |        |
|----------------|--------|--------|--------|--------|
| Interior depth | 636 mm | 636 mm | 636 mm | 636 mm |
| Inner doors    | 2      | 2      | 2      | 2      |
| Unit doors     | 1      | 1      | 1      | 1      |

#### Environment-specific data

|                                                                        |           |           |           |           |
|------------------------------------------------------------------------|-----------|-----------|-----------|-----------|
| Sound-pressure level                                                   | 47 dB(A)  | 47 dB(A)  | 47 dB(A)  | 47 dB(A)  |
| Average heat compensation at set value -80°C and T <sub>a</sub> = 21°C | 330 W     | 330 W     | 330 W     | 330 W     |
| Energieverbrauch bei Sollwert -80 °C und T <sub>a</sub> = 20 °C        | 7.9 kWh/d | 7.9 kWh/d | 7.9 kWh/d | 7.9 kWh/d |

#### Fixtures

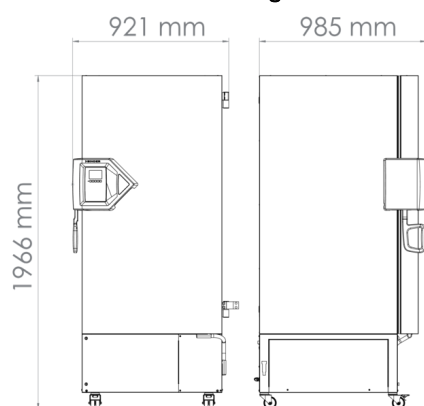
|                               |      |      |      |      |
|-------------------------------|------|------|------|------|
| Number of shelves (std./max.) | 3/11 | 3/11 | 3/11 | 3/11 |
|-------------------------------|------|------|------|------|

#### Load-variants

|                               |     |     |     |     |
|-------------------------------|-----|-----|-----|-----|
| Freezer racks per compartment | 4   | 4   | 4   | 4   |
| Cryoboxes, 50 mm              | 352 | 352 | 352 | 352 |

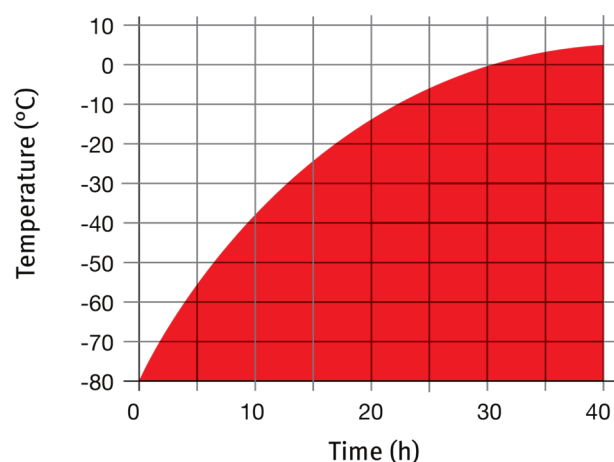
All technical data is specified for unloaded units with standard equipment at an ambient temperature of +22 °C ±3 °C and a power supply voltage fluctuation of ±10%. The temperature data is determined in accordance to BINDER factory standard following DIN 12880, observing the recommended wall clearances of 10 % of the height, width, and depth of the inner chamber. 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]



## DIAGRAMS

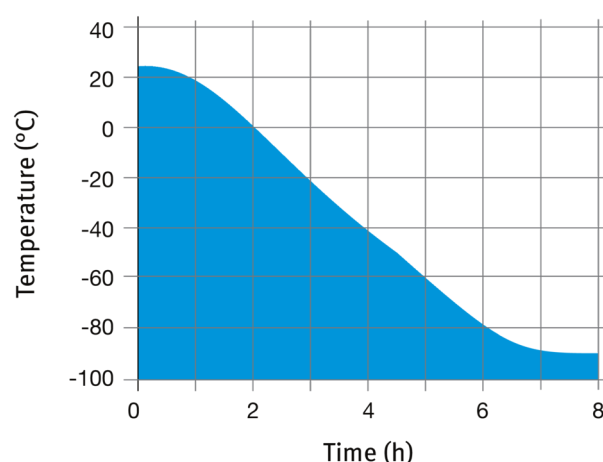
Pull-up time during power failure



Ambient temperature 22 °C, no load

Heating up rate

Pull-down time



Ambient temperature 25 °C, no load

Cooling down rate

## OPTIONS

| Designation                          | Description                                                                                                          | UFV 500 | * | Art.-No.  |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------|---------|---|-----------|
| Alarm system, battery-backed         | for maintaining temperature display, alarm messages, and communication                                               | •       | - | 8012-1910 |
| Analog output 4-20 mA                | for temperature values (output not adjustable)                                                                       | •       | - | 8012-1898 |
| Buck-boost converter                 | automatic voltage compensation                                                                                       | •       | - | 8012-1897 |
| Calibration certificate, expanded    | for temperature; for extending the measurement in center of chamber to include another test temperature              | •       | - | 8012-1126 |
| Calibration certificate, temperature | for temperature, measurement in center of chamber at specified temperature                                           | •       | - | 8012-0031 |
|                                      | temperature measurement incl. certificate, 20 measuring points at specified temperature                              | •       | - | 8012-0925 |
| Compartment doors                    | Foam-filled compartment doors with gasket                                                                            | •       | - | 8012-1893 |
| CO <sub>2</sub> backup cooling       | factory installed (allow for increased depth of UF V: 1085 mm), includes the option of a battery-backed alarm system | •       | - | 8012-1891 |
| Door access system                   | consisting of electromechanical door locking mechanism and electronic access control via NumPad                      | •       | - | 8012-1899 |
| Door lock                            | lockable door handle                                                                                                 | •       | - | 8012-1911 |
| Shipping pallet                      | with unloading ramp for installing unit without forklift                                                             | •       | - | 8012-1906 |
| Switch cover                         | Lockable main switch cover                                                                                           | •       | - | 8012-1980 |

## ACCESSORIES

| Designation                     | Description                                                                                                                                                 | UFV 500 | * | Art.-No.  |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---|-----------|
| 5 m power cable                 | C 13 refrigerator connection cable with BS 1363 British plug                                                                                                | •       | - | 5023-0285 |
|                                 | C 13 refrigerator connection cable with CEE 7/7 European plug                                                                                               | •       | - | 5023-0283 |
|                                 | C 13 refrigerator connection cable with type 13 Swiss plug                                                                                                  | •       | - | 5023-0284 |
| 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 |
| Chamber rack, aluminum          | for 5x4 standard boxes (50 mm), dimensions: H 278 x W 139 x D 564 mm                                                                                        |         |   |           |
|                                 | Set of 3                                                                                                                                                    | •       | - | 8012-2345 |
|                                 | Set of 4                                                                                                                                                    | •       | - | 8012-2346 |
|                                 | for 5x4 standard boxes (50 mm) incl. boxes, dimensions: H 278 x W 139 x D 564 mm                                                                            |         |   |           |
|                                 | Set of 3                                                                                                                                                    | •       | - | 8012-2347 |
|                                 | Set of 4                                                                                                                                                    | •       | - | 8012-2348 |
|                                 | for 6x4 standard boxes (50 mm), dimensions: H 334 x W 139 x D 564 mm                                                                                        |         |   |           |
|                                 | Set of 3                                                                                                                                                    | •       | - | 8012-2357 |
|                                 | Set of 4                                                                                                                                                    | •       | - | 8012-2358 |
|                                 | for 6x4 standard boxes (50 mm) incl. boxes, dimensions: H 334 x W 139 x D 564 mm                                                                            |         |   |           |
|                                 | Set of 3                                                                                                                                                    | •       | - | 8012-2359 |
|                                 | Set of 4                                                                                                                                                    | •       | - | 8012-2360 |
| Chamber rack, stainless steel   | for 5x4 standard boxes (50 mm), dimensions: H 278 x W 139 x D 561 mm                                                                                        |         |   |           |
|                                 | Set of 3                                                                                                                                                    | •       | - | 8012-2349 |
|                                 | for 5x4 standard boxes (50 mm), dimensions: H 278 x W 139 x D 561 mm                                                                                        |         |   |           |
|                                 | Set of 4                                                                                                                                                    | •       | - | 8012-2350 |
|                                 | for 5x4 standard boxes (50 mm) incl. boxes, dimensions: H 278 x W 139 x D 561 mm                                                                            |         |   |           |
|                                 | Set of 3                                                                                                                                                    | •       | - | 8012-2351 |

| Designation                                  | Description                                                                                                                                                                                                                                                     | UF V 500 | *         | Art.-No.  |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|-----------|
|                                              | Set of 4                                                                                                                                                                                                                                                        | •        | -         | 8012-2352 |
|                                              | for 6x4 standard boxes (50 mm), dimensions: H 334 x W 139 x D 561 mm                                                                                                                                                                                            |          |           |           |
|                                              | Set of 3                                                                                                                                                                                                                                                        | •        | -         | 8012-2361 |
|                                              | Set of 4                                                                                                                                                                                                                                                        | •        | -         | 8012-2362 |
|                                              | for 6x4 standard boxes (50 mm) incl. boxes, dimensions: H 334 x W 139 x D 561 mm                                                                                                                                                                                |          |           |           |
|                                              | Set of 3                                                                                                                                                                                                                                                        | •        | -         | 8012-2363 |
| Set of 4                                     | •                                                                                                                                                                                                                                                               | -        | 8012-2364 |           |
| Chamber rack with drawer,<br>stainless steel | for 5x4 standard boxes (50 mm), dimensions: H 278 x W 140 x D 562 mm                                                                                                                                                                                            |          |           |           |
|                                              | Set of 3                                                                                                                                                                                                                                                        | •        | -         | 8012-2353 |
|                                              | Set of 4                                                                                                                                                                                                                                                        | •        | -         | 8012-2354 |
|                                              | for 5x4 standard boxes (50 mm) incl. boxes, dimensions: H 278 x W 140 x D 562 mm                                                                                                                                                                                |          |           |           |
|                                              | Set of 3                                                                                                                                                                                                                                                        | •        | -         | 8012-2355 |
|                                              | Set of 4                                                                                                                                                                                                                                                        | •        | -         | 8012-2356 |
|                                              | for 6x4 standard boxes (50 mm), dimensions: H 334 x W 140 x D 562 mm                                                                                                                                                                                            |          |           |           |
|                                              | Set of 3                                                                                                                                                                                                                                                        | •        | -         | 8012-2365 |
|                                              | Set of 4                                                                                                                                                                                                                                                        | •        | -         | 8012-2366 |
|                                              | for 6x4 standard boxes (50 mm) incl. boxes, dimensions: H 334 x W 140 x D 562 mm                                                                                                                                                                                |          |           |           |
|                                              | Set of 3                                                                                                                                                                                                                                                        | •        | -         | 8012-2367 |
|                                              | Set of 4                                                                                                                                                                                                                                                        | •        | -         | 8012-2368 |
| Cryoboxes                                    | set consisting of 36 cardboard boxes with sample dividers                                                                                                                                                                                                       | •        | -         | 8012-2369 |
| Deicing kit                                  | consisting of de-icing tray, wiper and scraper                                                                                                                                                                                                                  | •        | -         | 8012-1900 |
| Grid shelf                                   | For temperature range -40 °C to -60 °C, 3 provided in set, including shelf supports                                                                                                                                                                             |          |           |           |
|                                              | stainless steel                                                                                                                                                                                                                                                 | •        | -         | 8012-1903 |
| pH-neutral detergent                         | concentrated, for gentle remove of residual contaminants; 1 kg                                                                                                                                                                                                  | •        | -         | 8012-2250 |
| Qualification documents                      | 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, CO <sub>2</sub> , O <sub>2</sub> – or pressure, depending on unit |          |           |           |
|                                              | Digital in PDF format                                                                                                                                                                                                                                           | •        | -         | 7057-0005 |
|                                              | Hard copy inside folder                                                                                                                                                                                                                                         | •        | -         | 7007-0005 |

| Designation | Description                                                                                                                                                                                                                                                         | UF V 500 | * | 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, CO <sub>2</sub> , O <sub>2</sub> , pressure, depending on unit |          |   |           |
|             | Digital in PDF format                                                                                                                                                                                                                                               | •        | - | 7057-0001 |
|             | Hard copy inside folder                                                                                                                                                                                                                                             | •        | - | 7007-0001 |
| Shelf       | Incl. shelf supports                                                                                                                                                                                                                                                |          |   |           |
|             | stainless steel                                                                                                                                                                                                                                                     | •        | - | 8012-1901 |

## SERVICES

| Designation                                  | Description                                                                                                                                                                                                                                                                                                                                 | *  | Art.-No.  |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----------|
| <b>Calibration services</b>                  |                                                                                                                                                                                                                                                                                                                                             |    |           |
| Calibration certificate, temperature         | Calibration of one (1) test temperature specified by the user in center of chamber, including certificate                                                                                                                                                                                                                                   | 05 | DL30-0190 |
| Temperature measurement, 20 measuring points | Temperature measurement with 20 measuring points with a set value specified by the user, including certificate                                                                                                                                                                                                                              | 05 | DL30-0620 |
| <b>Installation services</b>                 |                                                                                                                                                                                                                                                                                                                                             |    |           |
| Unit commissioning                           | Connect the unit to the customer-side connections (electricity, water, wastewater, gas), basic functions check, brief operating instructions. (excl.: unpacking, setup, controller instructions, programming, installation work)                                                                                                            | 05 | DL10-0300 |
| Unit instructions                            | Instruction regarding operating principle and basic functions of the unit, operation of the control electronics including programming                                                                                                                                                                                                       | 05 | DL10-0700 |
| <b>Maintenance contracts</b>                 |                                                                                                                                                                                                                                                                                                                                             |    |           |
| BRONZE 3-year maintenance contract           | Maintenance service as contractually agreed, visual inspection of mechanical and electrical components, check of control response, 20% discount on spare parts                                                                                                                                                                              | 05 | DL20-0720 |
| GOLD 3-year maintenance contract             | Maintenance service as contractually agreed, visual inspection of mechanical and electrical components, check of control response, 20% discount on spare parts, testing of all key functions, replacement of wear parts, calibration of one test temperature specified by the user in the center of the usable space, including certificate | 05 | DL20-0955 |
| SILVER 3-year maintenance contract           | Maintenance service as contractually agreed, visual inspection of mechanical and electrical components, check of control response, 20% discount on spare parts, testing of all key functions, calibration of one test temperature specified by the user in the center of the usable space, without certificate                              | 05 | DL20-0855 |
| <b>Maintenance services</b>                  |                                                                                                                                                                                                                                                                                                                                             |    |           |
| Maintenance                                  | One-off maintenance service in accordance with maintenance schedule. Visual inspection of mechanical and electrical components, testing of all key functions. Calibration of a test temperature specified by the user in center of usable space without certificate                                                                         | 05 | DL20-0603 |
| <b>Validation services</b>                   |                                                                                                                                                                                                                                                                                                                                             |    |           |
| Execution of IQ/OQ                           | Execution of IQ/OQ in accordance with qualification folder                                                                                                                                                                                                                                                                                  | 05 | DL41-0210 |
| Execution of IQ/OQ/PQ                        | Execution of IQ/OQ/PQ in accordance with qualification folder                                                                                                                                                                                                                                                                               | 05 | DL44-0500 |

## NOTES

- 05 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).

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