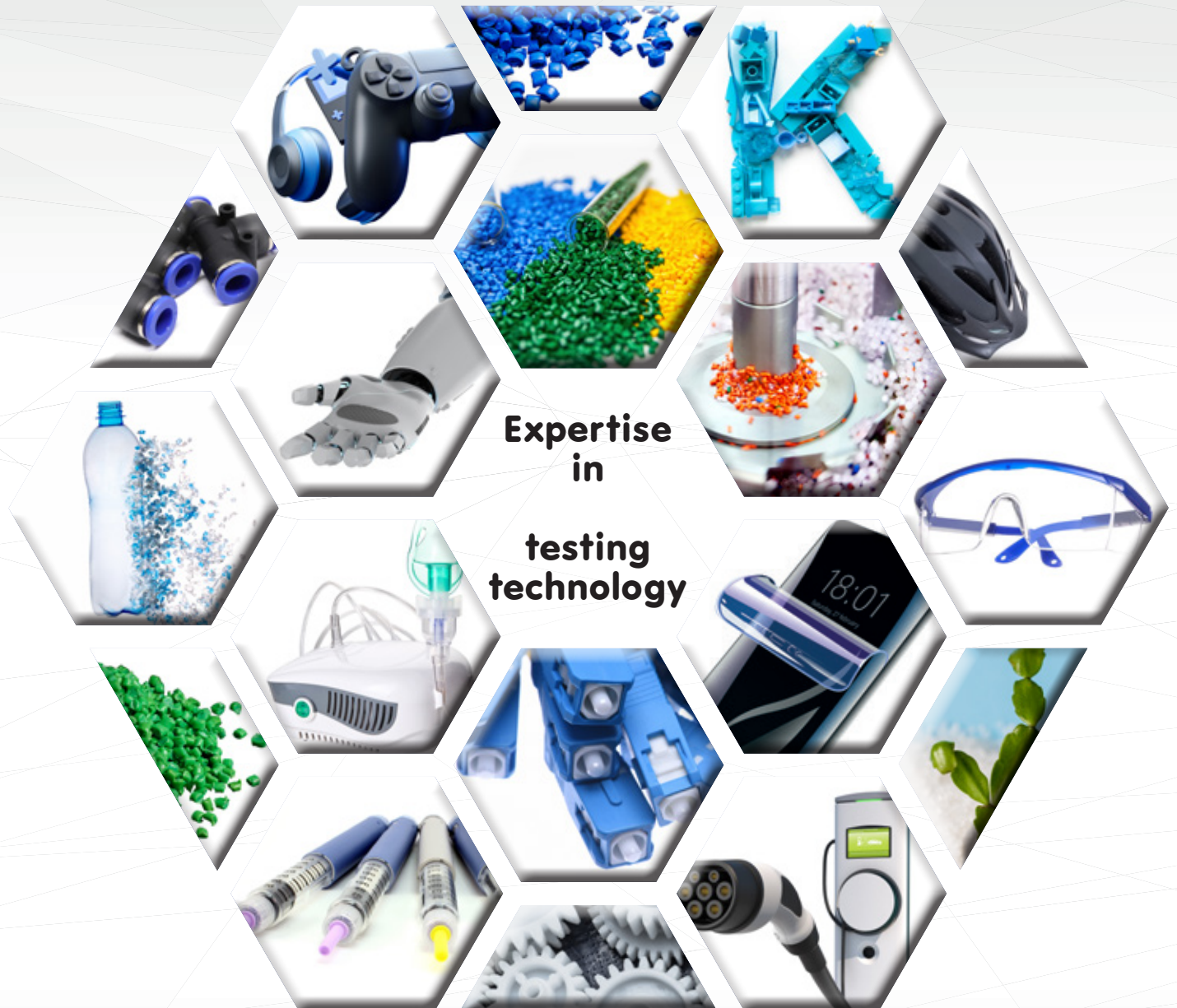
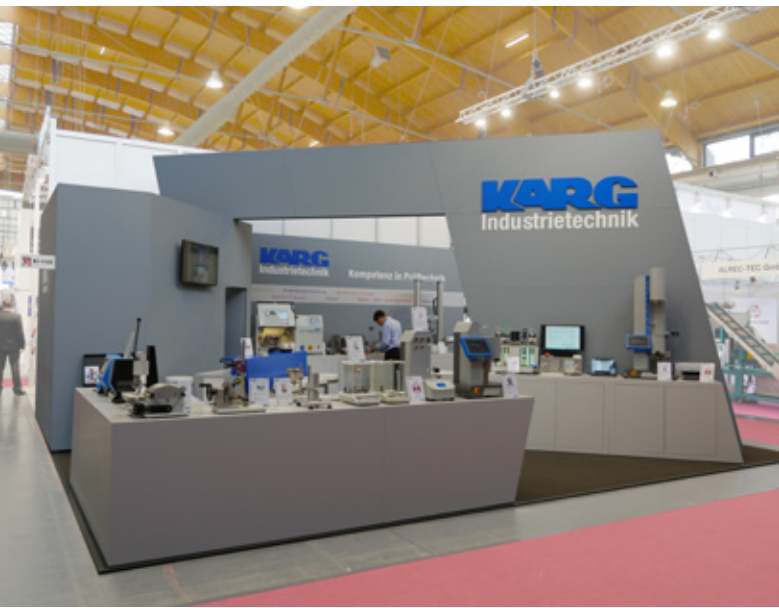


TESTING INSTRUMENTS

for Rubber and Plastics





KARG INDUSTRIE TECHNIK – EXPERTISE IN TESTING TECHNOLOGY

**Family owned business since 1971
Founded in Neuried near München.**

Our competence:

We are specialized in manufacturing and sales of plastic testing instruments or materials testing devices.

The product range includes:

- Instruments for raw material testing
- Instruments for specimen preparation
- Instruments for mechanical testing
- Instruments for electrical testing
- Instruments for optical measurement
- Instruments for further analyses
- Instruments for fire testing
- Temperature and climatic chambers
- Muffle furnaces
- Balances

Due to our great experience, we are able to supply turn key laboratories for the plastics industry.

As a service provider, we also offer user training, maintenance and calibration services on our instruments.

Our goal

The satisfaction of our customers is important to us, as they expect a well designed, reliable and state of the art products, as well as they expect a quick support and a professional service.

Long-term cooperation with our business partners and customers is the basis of our common success.

Our measuring and testing equipment are provided in the following industry / branches / markets:

- Plastic industry
- Automotive industry
- Testing laboratories | Universities | Colleges
- Electrical and electronic industry
- Rubber industry

Reserve technical changes



Instruments for raw material testing

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You don't find your product? Please let us have a call, we will be happy to give you an advisory service!

FLUOMETER

Fluometer type ADP

The bulk density tester is to measure the apparent or bulk density of pellets and powders of different raw material supplies. Furthermore, the values determined with this equipment are used for the calculation of the filling space of an injection mould. The bulk density at powdered, granular and other materials is determined according to different standards.

Features:

- Robust and stable measuring device
- Leveling device included
- Adjustable feet
- Adjustable filling funnel
- Quick release for spout (instrument dependent)
- Polished funnel and cup



Technical data:

| | Fluometer | | | | |
|----------------|--------------------------------------|-------------------------|-------------------------|-----------|----------------------|
| | ADP | | | | |
| Article Number | 1010.000 | 1013.000 | 1014.000 | 1015.000 | 1016.000 |
| Standard | DIN EN ISO 60 GB/T 1636 type A | ASTM D 1895, Meth. A | ASTM D 1895, Meth. B | SL-QC-003 | GBT/T 1636 type B |

Technical characteristics

| | | | | | |
|--|-----|-------|-------|------|-----|
| Upper inner diameter funnel [mm] approx. | 56 | 93 | 127 | 112 | 91 |
| Outlet inner diameter funnel [mm] | 33 | 9.5 | 25.4 | 39 | 10 |
| Funnel angle [°] | - | 20 | 12.45 | 15.7 | 20 |
| Inner diameter measuring cup [mm] | 45 | 39.93 | 46 | 86 | 45 |
| Volume measuring cup [ml] | 100 | 100 | 400 | 500 | 100 |
| Height measuring cup [mm] | 70 | 85 | 240 | 91 | 70 |

Dimension

| | | | | | |
|---------------------|-----|-----|-----|-----|-----|
| Width [mm] | 180 | 250 | 250 | 250 | 180 |
| Height [mm] | 312 | 872 | 872 | 872 | 312 |
| Depth [mm] | 250 | 320 | 320 | 320 | 250 |
| Weight [kg] approx. | 8 | 15 | 15 | 15 | 8 |

POURABILITY TESTER

Pourability tester type PM

As a check and for the control of the pourability of plastics in powder and granulates form by means of the determination of the flow through times by a funnel the pourability tester is used. The EN ISO 6186: 1998 defines two procedures (A and B), whereby from procedure A information can be derived to the processability; procedure B serves particularly for process control during the production.

The equipment consists of a mounting plate with a stable stand for the funnel holding. At the discharge of the funnel a thread for the attachment of different discharge nozzles (diameter 10, 15 or 25 mm) is designated.

The flow time is the time, in which a certain mass or a certain volume of the sample flows through a funnel with exactly defined dimensions. This time is indicated in seconds.

Features:

- Robust and stable measuring device
- Leveling device included
- Adjustable feet
- Different nozzles included (10, 15 and 25 mm)
- Adjustable filling funnel
- Polished funnel



Technical data:

| | Pourability tester |
|--|--------------------|
| | PM |
| Article Number | 1012.2.000 |
| Standard | DIN EN ISO 6186 |
| Technical characteristics | |
| Upper inner diameter funnel [mm] approx. | 110 |
| Outlet inner diameter funnel [mm] | 10 / 15 / 25 |
| Funnel angle [°] | 20 |
| Dimension | |
| Width [mm] | 180 |
| Height [mm] | 312 |
| Depth [mm] | 250 |
| Weight [kg] approx. | 8 |

ANGLE OF REPOSE TESTER

Angle of repose tester type PAM

As a check and for the examination of the pourability and / or the angle of repose of plastic granulates or powder according to DIN ISO 4324.

Features:

- Large diameter glass funnel
- Rotating stirrer
- Swiveling funnel closure
- Adjustable height measuring device with scale
- Stable base with removable base plate



Technical data:

| | Angle of repose tester |
|--|------------------------|
| | PAM |
| Article Number | 1011.000 |
| Standard | DIN ISO 4324 |
| Technical characteristics | |
| Upper inner diameter funnel [mm] approx. | 140 |
| Outlet inner diameter funnel [mm] | 10 |
| Funnel angle [°] | 60 |
| Diameter disc [mm] | 100 |
| Thickness disc [mm] | 25 |
| Dimension | |
| Width [mm] | 180 |
| Height [mm] | 400 |
| Depth [mm] | 250 |
| Weight [kg] approx. | 8 |

MELTING POINT

Melting Point Instrument type Kofler Heating Bench

Hotbench according Kofler for melting point determination and quick identification of organic substances.

Features:

- Simple and easy melting point determination
- Table top instrument
- Temperature range up to +260°C
- Corrosion free metal bench 360 mm length / 40 mm width
- Display via scale and reading device with slider / rider / pointer
- Different substances for calibration including
- Lancet needle (for positioning the material to be tested)



Technical data:

| | Kofler Heating Bench |
|----------------------------------|----------------------|
| Article number | |
| Technical characteristics | |
| Visual scale [°C] | +50 to +260 |
| Electrical data | |
| Mains voltage (nominal) | 230 |
| Power frequency [Hz] | 50 / 60 |
| Nominal Power | 100 |
| Dimensions | |
| Width [mm] | 400 |
| Height [mm] | 100 |
| Depth [mm] | 135 |
| Weight [kg] | 2 |

◆ MELT INDEX TESTER

MeltFloW *basic*

The Melt Index Tester series MeltFloW *basic* are highly precise melt index testing instruments for the measurement of the MFR (melt flow rate) in g/10 min. according to ISO 1133 method A, ASTM D 1238 method A and similar standards, used for quality control and research applications.

Features:

- Robust and stable model for masses up to 21,6 kg
- Up-to-date, modern and ergonomic design
- Precise and longtime constant temperature controlling
- Temperature range up to 400°C (optional 450°C)
- Manual cutting device
- Microprocessor controlled PID temperature regulator
- Different useful accessories available
- Automatic cutting device included (3150.000)



MeltFloW@on

The Melt Index Tester series MeltFloW @on are highly precise melt index testing instruments for the measurement of the MFR (melt flow rate) in g/10 min. and MVR (melt volume rate) in ccm/10 min. according to EN ISO 1133 method A/B, ASTM D 1238 method A/B and similar standards, used for quality control and research applications.

Features:

- Real modular melt index tester
- Up-to-date, modern and ergonomic design
- High precision and longtime constant temperature control
- Linear, high precision piston travel transducer
- User friendly and "all-included" Windows Software k-BASE, used for the instrument control and test evaluation, reference-, statistic- and filtering functions
- Automatic cutting device and motorized lifting
- Device optional available



MeltFloW@on plus

The Melt Index Tester series MeltFloW @on plus are highly precise melt index testing instruments for the measurement of the MFR (melt flow rate) in g/10 min. and MVR (melt volume rate) in ccm/10 min. according to EN ISO 1133 method A/B, ASTM D 1238 method A/B and similar standards, used for quality control and research applications.

Features:

- Fully automatic melt index tester
- Up-to-date, modern and ergonomic design
- Integrated set of masses "easy selection"
- Linear, high precision piston travel transducer
- User friendly and "all-included" Windows Software k-BASE, used for the instrument control and test evaluation, reference-, statistic- and filtering functions
- Inert gas overlay available
- Automatic cutting device and motorized lifting device included



Melt Index Tester Type PETFlow

The Melt Index Tester series PETFlow are highly precise melt index testing instruments for the measurement of the MFR (melt flow rate) in g/10 min., the MVR (melt volume rate) in ccm/10 min. according to EN ISO 1133 method A/B, ASTM D 1238 method A/B, as well as for the determination of the IV (Intrinsic value) in dl/gr. mainly used in quality control and research labs.

Features:

- Modified Melt Index Tester for the determination of the IV (Intrinsic Value) of PET-Flakes and Granules
- Standardized test conditions!
- Instrument incl. inert gas overlay and/or lifting device for test mass
- Optional: PET flakes Test-Kit
- User friendly and "all-included" Windows Software k-BASE, used for the instrument Control and test evaluation
- Temperature range up to 400°C



Technical data:

| | MeltFlow basic | MeltFlow basic plus | MeltFlow@on | MeltFlow@on plus | PETFlow |
|-------------------------------------|----------------|---------------------|-------------|------------------|------------|
| Article Number | 3100.000 | 3150.000 | 3200.000 | 3300.000 | 3200.000 P |
| Technical characteristics | | | | | |
| Temperature range [°C] | 400 | 400 | 400 | 400 | 400 |
| Resolution temperature display [°C] | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Dimension | | | | | |
| Width [mm] | 340 | 400 | 400 | 400 | 400 |
| Height [mm] | 470 | 470 | 470 | 1050 | 470 |
| Depth [mm] | 310 | 450 | 450 | 450 | 450 |
| Weight [kg] ¹⁾ | 26 | 31 | 31 | 85 | 31 |
| Electrical data | | | | | |
| Rated Voltage [V] | 230 | 230 | 230 | 230 | 230 |
| Nominal power [kW] | 1.3 | 1.3 | 1.6 | 1.6 | 1.6 |

¹⁾ without accessories

DENSITY METER

Fully automatic density measurement type MVS2pro Density

The MVS2pro is a robotized system for the determination of the density of polymers or other materials by the principle of the hydrostatic pressure opportunely corrected in order to obtain the result expressed in the MV(S) unit. The system is compliant to ISO 1183-1 (Method A), ISO 2781, ASTM D792 and ISO 293.

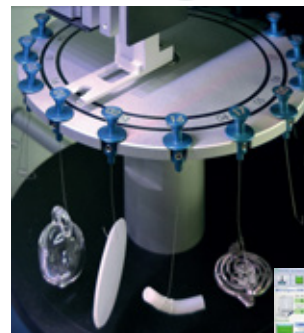
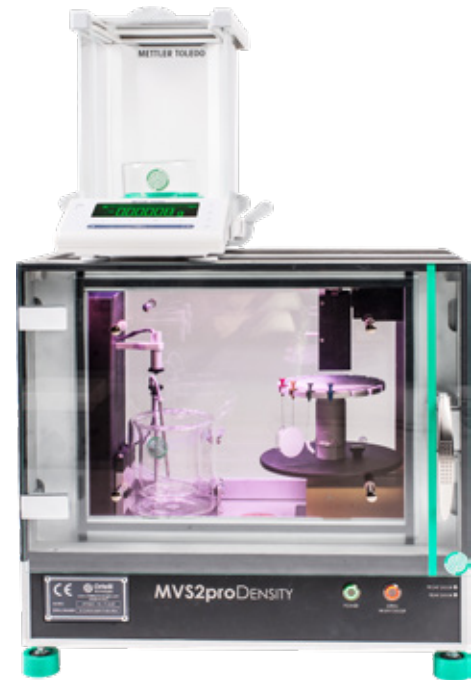
MVS2pro is developed to replace the old and inaccurate gradient column systems used for this measurement.

Following certified standards are used:

- 1 density standard
- 1 mass standard
- 1 volume standard
- 1 polymer standard (not certified)
- 1 standard temperature probe (certified thermometer)

Features:

- Autosampler with a maximum of 16 samples and/ or standard of density, mass or volume.
- Measurement time of one sample in about 120 sec.
- Constant temperature control
- Integrated statistical quality control plan
- Remote control and support of diagnosis
- Density management software



Scan me



Scan me

Technical data:

| | MVS2pro |
|--|------------------------------|
| Technical characteristics | |
| Reproducibility [%] | < 0,01 |
| Temperature range [C °] | 10 - 50 |
| Measuring range [g/cm³] | 0,78000 max. requested |
| Sample dimension Ø / thickness [cm] | approx. 3 - 4 / 0,2 |
| Measurement time [sec] / sample | 120 - 150 |
| Autosampler | 16 |
| Electrical data | |
| Rated Voltage [V] | 100 ... 240 |
| Power frequency [Hz] | 50/60 |
| Nominal power [W] | 150 |
| Dimensions (basic instrument, without balance, PC and thermostat) | |
| Width net [mm], approx. | 552 |
| Height net [mm], approx. | 510 |
| Depth net [mm], approx. | 315 |
| Weight [kg] | 35 |

Densimeter type ALS / ALJ

The densimeter series ALS / ALJ is a laboratory type density meter for the automatic determination of the density of solids and liquids. It can be used for measuring the density of plastics (film, specimens and finishing parts) according to DIN EN ISO 1183-1 and others.

Features:

- High precise density measurement for solids and liquids
- External / internal adjustment CAL (depending on type of densitometer)
- Up-to-date, modern and ergonomic design
- Step by step user guidance
- Calculated density indicated directly in the display
- Sturdy casing
- DKD certificate available



Technical data:

| | ALS 160-4A | ALS 250-4A | ALJ 160-4A | ALJ 160-4AM | ALJ 250-4A | ALJ 250-4AM |
|--------------------------|------------|------------|------------|-------------|------------|-------------|
| Measuring system | | | | | | |
| Weighing range [Max] [g] | 160 | 250 | 160 | 160 | 250 | 250 |
| Readout [mg] | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Reproducibility [mg] | 0,1 | 0,1 | 0,1 | 0,2 | 0,1 | 0,2 |
| Linearity [mg] | ±0,3 | ±0,3 | ±0,3 | ±0,3 | ±0,3 | ±0,3 |
| Calibration / Adjusting | externally | externally | internally | internally | internally | internally |
| DAkkS Certificate | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Verification value [mg] | - | - | - | 1 | - | 1 |
| Electrical data | | | | | | |
| Input voltage [V] AC | 110 - 230 | 110 - 230 | 110 - 230 | 110 - 230 | 110 - 230 | 110 - 230 |
| Dimensions | | | | | | |
| Width [mm] | 210 | 210 | 210 | 210 | 210 | 210 |
| Height [mm] | 330 | 330 | 330 | 330 | 330 | 330 |
| Depth [mm] | 340 | 340 | 340 | 340 | 340 | 340 |
| Weight approx. [kg] | 7 | 7 | 7 | 7 | 7 | 7 |

Other versions on request!

MOISTURE METER

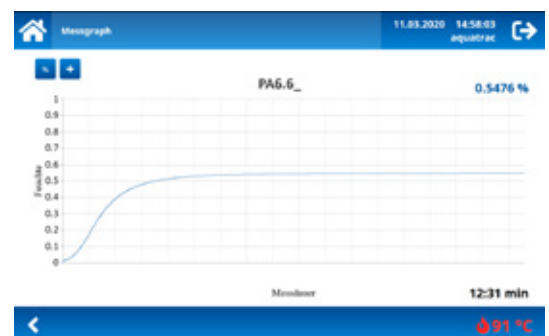
Moisture Meter type Aquatrac® V

The water content of plastic material has a great influence on the quality of the finished product. The test should be made swiftly on an instrument having a simple test procedure. The AQUATRAC V is a moisture meter for use with solid products in granular form and is designed to meet requirements of the plastic processing industry. It detects water content down to 0.0005%. It is robust and portable thus being suitable for shop floor use. As the principle of operation is an absolute chemical method, no calibration is required for each different substance tested. The sample weight is fairly high and is therefore representative for the batch being tested.

The recognised calcium hydride method according to DIN EN ISO 15512:2019 as method E, Plastics - Determination of water content by the calcium hydride method, is used as the measuring method.

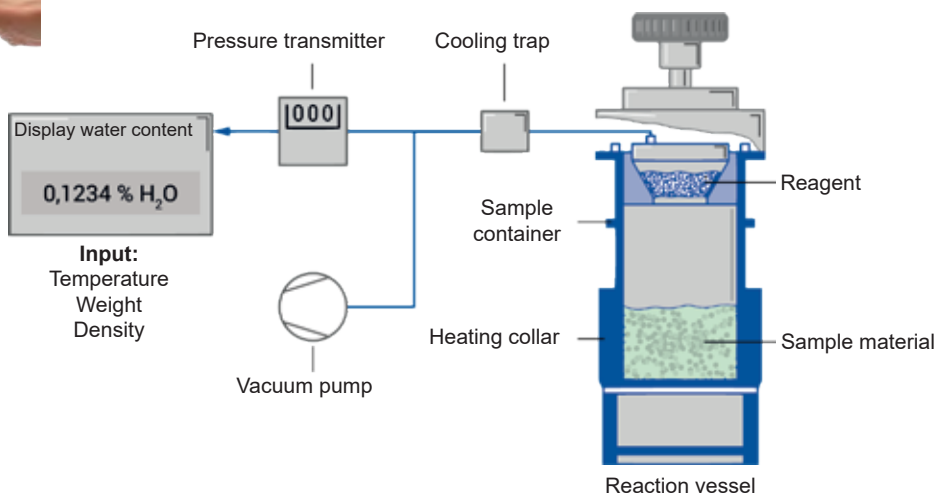
Features:

- Resolution - 0.01mg / 1ppm / 0.0001% H₂O
- Portable and robust - can be used for transport
- Reliable and reproducible - recognised worldwide in the industry for 30 years
- Easy handling and menu navigation - thanks to software wizard
- Stand-alone unit - can be used without additional peripherals
- User database - convenient control of access rights
- Improved material database
- high-resolution touch display
- Managed network access





Measuring scheme



Technical data:

| | | Aquatrac® V |
|--|--|-------------|
| Technical characteristics | | |
| Measuring range [relative / absolute] | 0,0001 – 60 % H ₂ O / 0,01 – 60 mg H ₂ O | |
| Precision [%] of measuring range end value | ±1,4 | |
| Resolution [mg/ppm/%H ₂ O] | 0,01 / 1 / 0,0001 | |
| Temperature range [C °] | 60 - 200 | |
| Sample weight [g] | from 0,1 | |
| Measurement time [min] depending on material | 10...60 | |
| Measurement result | mg, ppm, % | |
| Interfaces | 3xUSB 2.0, 1xEthernet | |
| Electrical data | | |
| Rated Voltage [V], depending upon model | 110/115/230 ± 10 % | |
| Power frequency [Hz] | 50/60 | |
| Nominal power [W] | 450 | |
| Dimensions | | |
| Width net [mm] | 510 | |
| Height net [mm] | 325 | |
| Depth net [mm] | 230 | |
| Weight [kg] | 14.2 | |

◆ VISCOSITY MEASURING DEVICE

Viscosimeter type ViscoClock plus

The ViscoClock plus is the economically priced introductory model in the field of automatic viscosity (absolute and relative) measurements. Manual measurements with a stopwatch and a trained eye is therefore something from the past because time is money. The ViscoClock is an electronic time-measuring unit used to determine absolute and relative viscosity. It consists of a stand which is used to mount a viscometer or the electronic measuring unit. The two measuring levels are integrated in the stand made of high-quality PPA synthetic material, and the electronic measuring unit is included in a PP casing. The large LCD display allows the measured values to be read off easily.

Features:

- Precision and price down to a point
- High precise viscosity measurement
- Compatible with micro-Ubbelohde & micro-Ostwald viscometers
- Automatic time measurement
- Different type of ubbelohde viscometer available
- Digital LCD display
- Different kind of water bathes available
- Incl. calibration certificate for each viscometer
- Different options for specimen preparation available



Technical data:

| | ViscoClock plus |
|--|----------------------------------|
| Technical characteristics | |
| Range [s] | up to 999,99 |
| Resolution [s] | 0,01 |
| Accuracy time measurement [s/max. %] | ±0,01 / 0,1 |
| Measuring range viscosity [mm ² /s / cst] | depending on the viscometer used |
| Measured parameter | Flow-through time [s] |
| Electrical specifications | |
| Power supply via mains adapter [V] | 100...240V (DC +9V) |

Viscosimeter type AVS 470

The new ViscoSystem® AVS 470 is the first viscosity measuring device that allows "suction" and "pressure" measurements completely independent of a PC. This results in maximum independence and flexibility, allowing you to set up a measuring station that meets highest requirements even under difficult conditions, e.g. to monitor production or control quality in the polymers industry.

Perfectly equipped for fully automatic viscosity measurements

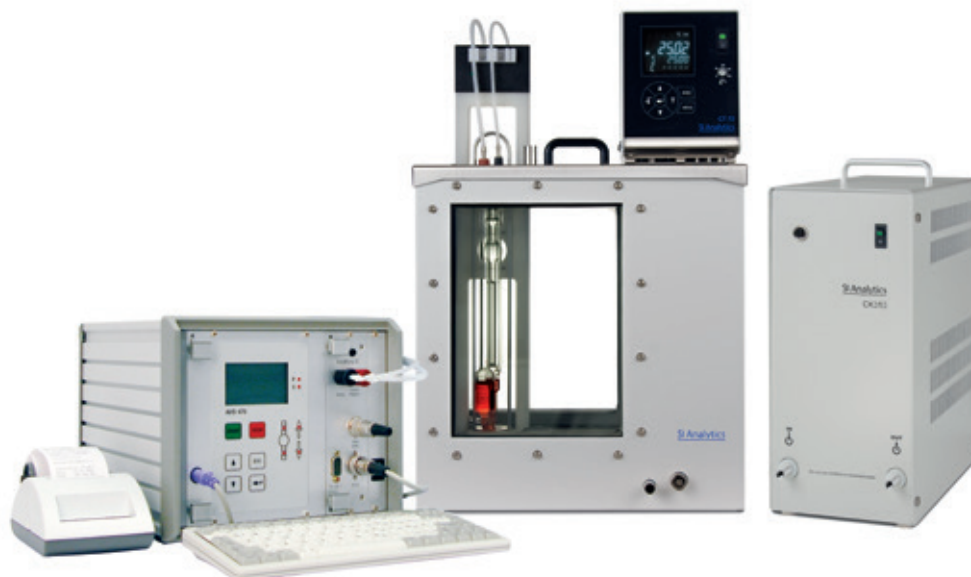
The ViscoSystem® AVS 470 is a measuring system that includes almost everything you need to take precise and reproducible measurements. All common types of viscosity calculation are already integrated into the device, a small PS2 keyboard is all you need to enter additional data. A serial printer can be used to conveniently document your measuring results. So, in a minimum of space, you can set up a measuring station equal in every way to complex measuring installations in terms of precision and reproducibility.

Working with the ViscoSystem® AVS 470 is easy

The ViscoSystem® AVS 470 is very easy to handle. The desired measuring method can be preselected and started on the device. The entire measurement is done automatically to exclude subjective measurement errors. Once the set pre-heating time is reached, the desired number of measurements are taken while the status of the measurements is indicated on the LC.

Features:

- Precision and price down to a point
- High precise viscosity measurement
- Automatic time measurement
- Serial printer connection
- The following viscometers can be used with the AVS 470: Ubbelohde viscometers acc. DIN, ASTM, micro Ubbelohde viscometer to DIN, micro Ostwald viscometer, Cannon-Fenske routine viscometer, TC Ubbelohde viscometer, TC micro Ubbelohde viscometer



Technical data:

| | AVS 470 (stand-alone) |
|--|----------------------------------|
| Technical characteristics | |
| Range [s] | 5 up to 9999.99 |
| Resolution [s] | 0.01 |
| Accuracy time measurement [s/max. %] | ±0.01 / 0,1 |
| Measuring range Viscosity [mm ² /s/cst] | depending on the viscometer used |
| Pre-temperature, pre-selectable [min] | 0...20 |
| Measured parameters | Flow-through time [s] |
| Electrical specifications | |
| Rated voltage (± 10%) 50/60 Hz [V] | 90...240 |
| Dimensions | |
| Width [mm] | 255 |
| Height [mm] | 205 |
| Depth [mm] | 320 |
| Weight incl. Pump module [kg] | 5.5 |

Viscosimeter type AVS 370

The ViscoSystem® AVS 370 is a measuring device, which not only measures as precisely and consistently as you expect, but also offers you maximum flexibility and possibilities for future extensions. Furthermore, it also saves valuable space on the laboratory bench.

Now possible for the first time ever: "suction" and "pressure" measurement - with one device

The ViscoSystem® AVS 370 is the first viscosity measuring device, which can be used for both "suction" and "pressure" measurement. This enables simple adjustment of the method of measurement to each sample. This significantly reduces investment costs for measuring stations at which pressure and suction methods are to be used. In most cases, using the AVS 370 also achieves noticeable savings in setting up time.

Can be extended from an affordable individual measuring station up to an 8-sample station

The basic version of the ViscoSystem® AVS 370 is an affordable starter model, which can be used to measure high or low viscosity liquids. In the version for TC viscosimeters it is ideal, e.g. to measure opaque and black fluids. If necessary, each single measuring station can be extended to form a multiple measuring station with PC-controlled multi-tasking. The WinVisco 370 software included in the standard equipment enables parallel operation of two fully equipped AVS 370s, with a total of eight ViscoPump II modules. Each module can measure a different sample using a different method. All the results can be quickly and easily evaluated and documented independently of each other. It could hardly be more flexible!

Up to eight viscosity measurement modules can be controlled with the software WinVisco 370, part of the standard equipment.

Features:

- Precision and price down to a point
- High precise viscosity measurement
- Automatic time measurement
- Different type of Ubbelohde capillaries available
- Step by step user guidance
- Different bath thermostats available for different applications available
- Automatic capillary cleaning (option)
- User friendly windows software available



◆ DIMENSION MEASUREMENT

Thickness gauges

Thickness gauges of the TG series allow precise measurement of specimens according to international standards. Various probes, loads / weights and measuring forces are available for a wide range of materials and standards.



Features / Equipment:

- Simple measurement
- Transfer of measured results to test software
- Special inserts and weights for many applications
- Granite measuring table (Ø200 x 40 mm)
- Extended measuring range by means of gauge block (optional)
- DAkkS calibration certificate optional
- Factory calibration certificate optional
- Lifting device optional
- Software optional

Technical data:

| | TG1 | TG2 | TG3 | TG4 | TG8 | TG9 | TG17 |
|--|-----------------------|------------------------|----------|---------------------|-------------|-------------------|--------------|
| Application | Rubber / Elastomers | Foil / Film | Textiles | Rubber / Elastomers | Geoplastics | Paper / Cardboard | Flex packing |
| | Hardness >35 IRHD | | | Hardness <35 IRHD | | | |
| Standard | ISO 23529, ASTM D3767 | ISO 4593 DIN 53370 | ISO 5084 | ASTM D3767 | ASTM D5199 | DIN EN 534 | ASTM F2251 |
| Measuring range [mm] | 0...12 | 0,8 / 1,8 | 0...12 | 0...12 | 0...12 | 0...12 | 0...12 |
| Resolution [mm] | 0,001 | 0,005 / 0,001 / 0,0002 | 0,001 | 0,001 | 0,001 | 0,001 | 0,001 |
| Probe [mm] | Ø4 | Ø10 | Ø50,5 | Ø16 | Ø56,4 | Ø16 | Ø15,875 |
| Force [kPa] | 22 | • | 1 | 10 | 2 | 100 | 50,3 |
| Support weight [g] | 28 | 10...50 | 204 | 212 | 509,5 | 2050 | 1033 |
| Interface | USB / RS 232 | | | | | | |
| Dimension [mm] | Ø 200 x 250 (H) | | | | | | |
| Weight approx. w/o support weight [kg] | 6 | | | | | | |
| Battery operated | • | • | • | • | • | • | • |

Thickness gauges with high resolution

Thickness gauges of the TGC series allow precise measurement of specimens according to international standards such as ISO 4593 or DIN 53370 or others. Various probes are available for special requirements, e.g. with reduced spring force for testing film thickness.



Features / Equipment:

- High-resolution and high-contrast colour display
- Display can be tilted steplessly for optimum viewing angle
- Extremely simple operation
- Mains or battery operation possible
- Battery operation also suitable for mobile use
- Compact housing

Technical data:

| | TGC1202 | TGC1200M |
|-----------------------------------|---|---|
| Measuring range [µm] | +/- 5000 +/- 2000 +/- 1000 +/- 300 +/- 100 +/- 30 +/- 10 +/- 3 | +/- 5000 +/- 2000 +/- 1000 +/- 300 +/- 100 +/- 30 +/- 10 +/- 3 |
| Resolution / Digit increment [µm] | 0,01, 0,1, 1 | 0,1 |
| Display digital | • | • |
| Sensor input | 3 | 1 |
| Interface | USB | Opto RS-232C, USB, Digimatic, Wireless |
| Weight [kg], approx. | 0,5 | 0,5 |
| Power supply [V/Hz] | 230/115 / 50-60 | 230/115 / 50-60 |

STRIP CUTTER

Strip Cutter type "SingleCut"

The Strip Cutter is developed to cut over pieces of parallel strips in one processing step. These strips can be used for further evaluations (e. g. tensile strength, stretch, elastic module, etc.) according to international standards.

Features / Equipment:

- Single Cut
- Knives grindable
- Side with scale in mm / inch
- Knife protection
- Stable knife guiding
- Dual stockpiled knife axis for precision cuts
- Cutting device for thin cuts from 1 ... 10 mm



Technical data:

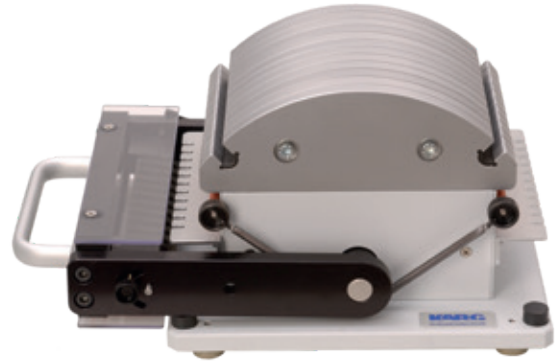
| | SingleCut |
|---------------------|-----------|
| Article Number | 2895.000 |
| Dimensions | |
| Cutting length [mm] | 385 |
| Cutting width [mm] | variable |
| Width [mm] | 410 |
| Height [mm] | 260 |
| Depth [mm] | 575 |
| Weight [kg] | 9 |

Strip Cutter for film and paper

The film-/paper Strip Cutter is developed to cut over for instance DIN A 4 large film or paper sheets up to 12 pieces parallel strips in one processing step. These strips can be used for further tests (e. g. tensile strength, tension, elastic modulus, etc.) according to international standards.

Features / Equipment:

- Two-way cutting
- Adjustable connecting strip
- Adjustment over curved surface ensures a clamping free from creases
- Cutting movement over lever guidance
- Cutting angle adjustable
- Easy and save knife exchange
- Knife changing device included



Technical data:

| | StripCutter |
|---------------------------------|--|
| Article Number | (see table below) |
| Dimensions | |
| Cutting length [mm] | 230 |
| Width [mm] | 420 |
| Height [mm] | 340 |
| Depth [mm] | 290 |
| Weight [kg] | 29 |
| Different model variants | |
| Article number | No x Strip width ¹⁾ [Pcs. x width] |
| 2800.000 | 10 x 15 mm |
| 2810.000 | 12 x 10 mm |
| 2820.000 | 3 x 25 mm / 5 x 15 mm |
| 2830.000 | 6 x 15 mm |
| 2860.000 | 3 x 10 mm / 3 x 15 mm / 3 x 25 mm |
| 2870.000 | 5 x 25,4 mm / 2 x 12,7 mm |
| 2880.000 | 12 x 12,7 mm |
| 2881.000 | 10 x 12 mm |
| 2882.000 | 6 x 15 mm / 5 x 12,7 mm |
| 2883.000 | 7 x 20 mm |
| 2884.000 | 5 x 10 mm / 5 x 20 mm |
| 2885.000 | 4 x 10 mm / 4 x 15 mm / 2 x 25 mm |
| 2886.000 | 4 x 10 mm / 4 x 15 mm / 2 x 12,7 mm / 1 x 25 mm |
| 2890.000 | 6 x 25,4 mm |

¹⁾ other strip width or combinations upon request

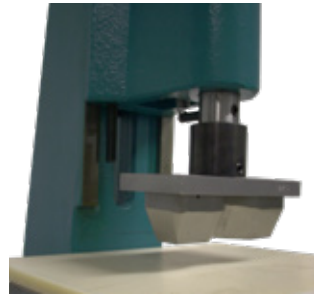
SPECIMEN PUNCHING MACHINES

Specimen punching machines

To punch out specimens from soft to semi-hard materials. The cutting dies with and without ejectors are available in different dimensions and geometries according to the international standards. The handling of the punching machine takes place by means of lever arm or pneumatically.

Features / Equipment:

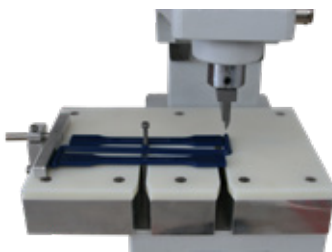
- Different stroke length available
- Extra rigid design of press base
- The working height can easily be adjusted
- Easy and quick cutting die / punch exchange
- Our punching dies can be fitted to any kind of present punching machines
- Punching machines can be modified for different applications, such as:
- FNCT (full notched creep test) specimen preparation
- Each punch is supplied with a solid support or punching table and an absorber plate



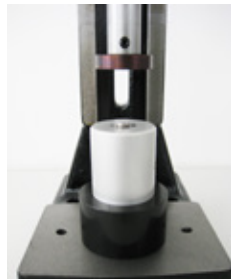
Manuelle Probekörperstanze

Optional:

- Gate cutting
- Press cylinder for tablet press



Specimen punching machine / Gate- and runner cutting



Tablet press



FNCT specimen punching machine



Pneumatic specimen punching machine for aluminium specimens

Technical data:

| | Manual specimen punching machine | | | Pneumatic specimen punching machine | | | |
|-----------------------|----------------------------------|-----------|-----------|-------------------------------------|----------|----------|----------|
| | MPS 7.5 | MPS 15-40 | MPS 30-30 | PPS 5 | PPS 32 | PPS 34 | PPS 60 |
| Article Number | 2300.000 | 2400.000 | 2410.000 | 2503.000 | 2500.000 | 2505.000 | 2504.000 |
| Punching capacity [N] | 7500 | 15000 | 30000 | 5000 | 32000 | 34000 | 60000 |

Technical characteristics

| | | | | | | | |
|----------------------------|----|-----|-----|----|-----|-----|-----|
| Pneumatically driven press | | | | ✓ | ✓ | ✓ | ✓ |
| Manual working press | ✓ | ✓ | ✓ | | | | |
| Working stroke [mm] | 40 | 40 | 30 | 35 | 40 | 80 | 40 |
| Daylight [mm] | 80 | 100 | 100 | 80 | 130 | 130 | 150 |

Dimension

| | | | | | | | |
|-------------------------|-----|-----|-----|-----|-----|------|-----|
| Width [mm] | 250 | 250 | 250 | 250 | 250 | 260 | 350 |
| Height [mm], unactuated | 650 | 830 | 950 | 650 | 900 | 1400 | 900 |
| Depth [mm] | 270 | 320 | 350 | 320 | 450 | 420 | 500 |
| Weight [kg] approx. | 30 | 45 | 70 | 25 | 100 | 110 | 150 |

ISO MOULD

AIM™ Quick Change Injection Mould System

Comparability by uniform standards, flexibility by quick change

The AIM (Axxicon ISO Manufactured) Quick Change Mold, used within the polymer industry, is a flexible test mold system designed to comply exactly with the internationally accepted ISO standards which are also used by CAMPUS® — the plastics database.

The AIM Quick Change Mold is a multi-functional injection mold with interchangeable inserts, used on conventional injection molding machines and capable of producing plastic specimen for quality specimen tests according to international standards.

These types of specimen tests are commonly used to determine the material key properties such as tensile strength, Izod and Charpy impact strength, hardness, flammability, shrinkage and gloss/colour matching.

The modular AIM™ Quick Change Mould System consists of a mould base, a mirror plate and as many product forming inserts as you require. The quick change mould system can be designed for tool temperatures up to 100 °C, up to 140 °C or up to 250 °C!

Many customers still require tests in accordance with ASTM, BS, JIS, SAC or other standards. We accommodate them too, by providing inserts for any standard required. Besides standard inserts we also supply customised inserts and inserts for special applications like hybrid technology / overmoulding and injection compression. The AIM™ Quick Change Mould Systems XL and XXL are specially designed for moulding larger parts or creating even more flexibility!

Features / Equipment:

- Standardised design
- In accordance with ISO specifications
- Flexibility by quick change: changing of product forming inserts in seconds
- Horizontal change of inserts and mirror plates for increased convenience
- Compatible with regular injection moulding machines
- Extremely reliable
- Approved by CAMPUS®







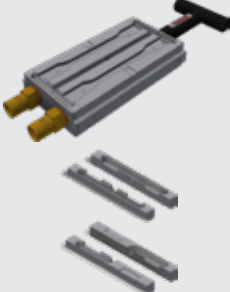
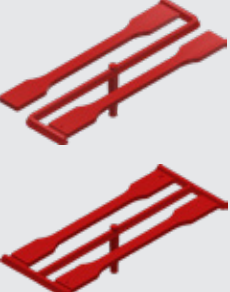
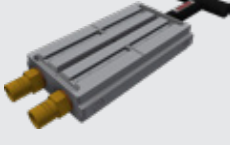





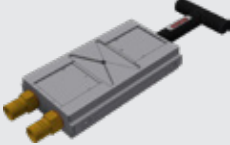

AIM-Prospekt



AIM Standard Movie



Type of inserts standard / special:

| Type | Standards / Application | Description | Dimension [mm] *) | Design Insert*) | Design Specimen |
|-------------------------------|---|---|-------------------|---|---|
| ISO A | <ul style="list-style-type: none"> DIN EN ISO 527-2, 1A ISO 3167, Type A ISO 20753, Type A1 ISO 899-1:2017-09 ISO 2039-1:2001-12 | Gate according ISO 294-1 (2017), Z-runner, Surface polished: Standard N2 Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/- 36 T at 500 bar Volume: 30,58 cm ³ Surface: 72,67 cm ² | 170x20/10x4 |  |  |
| ISO A with weldline | <ul style="list-style-type: none"> DIN EN ISO 527-2, 1A ISO 3167, Type A ISO 20753, Type A1 ISO 899-1:2017-09 ISO 2039-1:2001-12 | Gate according ISO 294-1 (2017), Double-T-runner Surface polished: Standard N2 Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/- 39 T at 500 bar Volume: 33,12 cm ³ Surface: 78,76 cm ² | 170x20/10x4 |  |  |
| ISO A with / without weldline | <ul style="list-style-type: none"> DIN EN ISO 527-2, 1A ISO 3167, Type A ISO 20753, Type A1 ISO 899-1:2017-09 ISO 2039-1:2001-12 | Gate according ISO 294-1 (2017), Z-runner, Double-T-runner Surface polished: Standard N2 Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/- 36/39 T at 500 bar Volume: 30,58 / 33,12 cm ³ Surface: 72,67 / 78,76 cm ² | 170x20/10x4 |  |  |
| ISO B | <ul style="list-style-type: none"> DIN EN ISO 178 DIN EN ISO 899-2 DIN EN ISO 604 ISO 179-1+2 DIN EN ISO 180 DIN EN ISO 8256 ISO 75-1+2 DIN EN ISO 306 ISO 22088-3 ISO 1183-1+2 ISO 4589-2 | Gate according ISO 294-1 (2017), Double-T-runner Surface polished: Standard N2 Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/-33 T at 500 bar Volume: 29,63 cm ³ Surface: 66,10 cm ² | 80x10x4 |  |  |
| ISO C | <ul style="list-style-type: none"> DIN EN ISO 8256 | Gate according ISO 294-2 (2019), Double-T-runner Surface polished: Standard N2 Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/- 25 T at 500 bar Volume: 18,73 cm ³ Surface: 49,29 cm ² | 60x10x3 |  |  |
| ISO D11 (ex D1) | <ul style="list-style-type: none"> ISO 6721-2 DIN EN ISO 29753 | Gate according ISO 294-3 (2020), Double fangate runner Surface polished: Standard N1 Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/- 54 T at 500 bar Volume: 12,71 cm ³ Surface: 108,5 cm ² | 60x60x1 |  |  |
| ISO D12 (ex D2) | <ul style="list-style-type: none"> ISO 6603-1/-2 ISO 294-4 ISO 4892-2 DIN EN ISO 29753 | Gate according ISO 294-3 (2020), Double fangate runner Surface polished: Standard N1, Cr-Steel, HRc: 50-52 Draft 1° Clamping force: +/- 54 T at 500 bar Volume: 12,73 cm ³ Surface: 108,71 cm ² | 60x60x2 |  |  |

| Type | Standards / Application | Description | Dimension [mm] *) | Design Insert*) | Design Specimen |
|------------------------|--|---|-------------------|-----------------|-----------------|
| ISO F (old) | <ul style="list-style-type: none"> Determination of anisotropy | Gate according Axxicon-Desing, Double-Film-runner Surface polished: Standard N1, Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/- 77 T at 500 bar Volume: 33,96 cm ³ Surface: 152,72 cm ² | 88x80x2 | | |
| ISO F (234) | <ul style="list-style-type: none"> Determination of anisotropy | Gate according ISO 294-1 (2017), Double-Film-runner Surface polished: Standard N1, Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/- 83 T at 500 bar Volume: 38,93 cm ³ Surface: 166,20 cm ² | 90x80x2 | | |
| ISO F (271) | <ul style="list-style-type: none"> Determination of anisotropy | Gate according ISO 294-1 (2017), Film-runner Surface polished: Standard N1, Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/- 55 T at 500 bar Volume: 25,84 cm ³ Surface: 108,42 cm ² | 120x80x2 | | |
| ISO 527-2, Type 5A | <ul style="list-style-type: none"> ISO 527-2 | Gate according ISO 294-1 (2017), Z-runner Surface polished: Standard N2, Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/- 15 T at 500 bar Volume: 9,64 cm ³ Surface: 28,87 cm ² | 75x12.5/4 x2 | | |
| ISO 527-2, Type 1BA | <ul style="list-style-type: none"> ISO 527-2 | Gate according ISO 294-1 (2017), Z-runner Surface polished: Standard N2, Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/- 12,5 T at 500 bar Volume: 8,80 cm ³ Surface: 25,02 cm ² | 75x10/5x2 | | |
| Plaque 50 x 50 x 6 mm | <ul style="list-style-type: none"> ASTM D2240 (Shore) ISO 868 (Shore) ISO 7619-1 (Shore) Various | Gate according Axxicon Design Surface polished: Standard N1, Cr-Steel, HRc: 50-52, Draft 10° Clamping force: +/-37 T at 500 bar Volume: 44,20 cm ³ Surface: 74,27 cm ² | 50x50x6 | | |
| Disc | <ul style="list-style-type: none"> Various | Gate according Axxicon Design Surface polished: Standard N1, Cr-Steel, HRc: 50-52, Draft 10° Clamping force: +/-59,4 T at 500 bar Volume: 37,05 cm ³ Surface: 118,78 cm ² | Ø85x3 | | |
| Spiral flow (2 / 3 mm) | <ul style="list-style-type: none"> Determination of the flow path to assess the flow behaviour of materials | Gate according Axxicon - Design Surface polished: Standard N2, Cr-Steel, HRc: 50-52, Draft 10° Clamping force: +/-35/37 T at 500 bar Volume: 15,48/22,66 cm ³ Surface: 69,97/74,27 cm ² | 1150x5x2(3) | | |

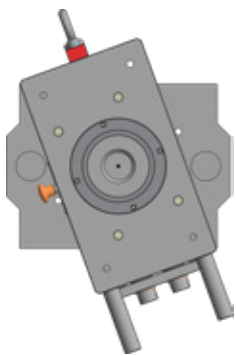
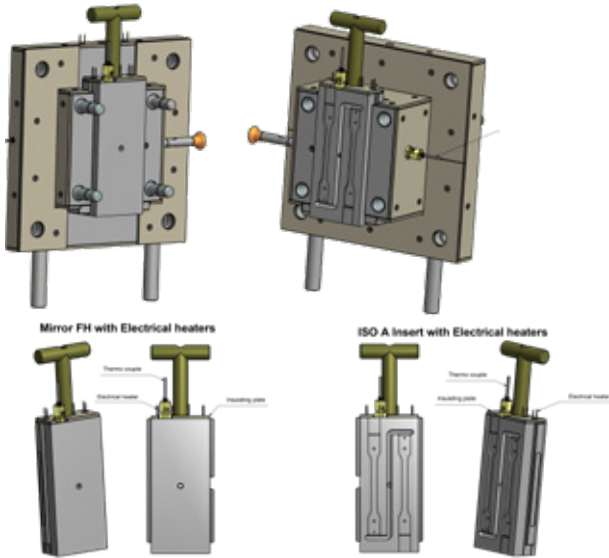
| Type | Application | Description | Dimension [mm] *) | Design Insert | Design Specimen |
|---|----------------------------|--|--------------------------------|---|---|
| ASTM D256 Izod (3,2 / 6,4) | • ASTM D256 | Gate according ASTM D3641-15, Double-T-runner Surface polished: Standard N2, Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/- 31 T at 500 bar Volume: 22,66/33,63 cm ³ Surface: 61,22 cm ² | 63,5x12,7x3,2 63,5x12,7x6,4 |  |  |
| ASTM D6110 Charpy (3,2 / 6,4) | • ASTM D6110 | Gate according ASTM D3641-15, Z-runner Surface polished: Standard N2, Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/-27,1 T at 500 bar Volume: 20,12 / 30,95 cm ³ Surface: 54,22 / 54,27 cm ² | 127x12,7x3,2 127x12,7x6,4 |  |  |
| ASTM D638 Type I (3,2) | • ASTM D638 | Gate according ASTM D3641-15, Z-runner Surface polished: Standard N2, Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/-38,1 T at 500 bar Volume: 27,4 cm ³ Surface: 76,14 cm ² | 165x13x3,2 |  |  |
| ASTM D638 Type IV (3,2) | • ASTM D638 | Gate according ASTM D3641-15, Z-runner Surface polished: Standard N2, Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/-25,1 T at 500 bar Volume: 17,82 cm ³ Surface: 50,21 cm ² | 115x19/6x3,2 |  |  |
| ASTM D648 (3,2) = ASTM D790 (3,2) ASTM D648 (6,4) | • ASTM D648 • ASTM D790 | Gate according ASTM D3641-15, Z-runner Surface polished: Standard N2, Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/-27,1 T at 500 bar Volume: 20,12/30,94 cm ³ Surface: 54,22 cm ² | 127x12,7x3,2 127x12,7x6,4 |  |  |
| UL94 (1,5 / 3,0 mm) | • UL94 | Gate according ASTM D3641-15, Z-runner Surface polished: Standard N2, Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/-27 T at 500 bar Volume: 14,39 / 19,71 cm ³ Surface: 53,65 / 53,8 cm ² | 125x13x1,5 125x13x3 |  |  |
| UL 94 (0,75 mm) | • UL94 | Gate according Axxicon Design Surface polished: Standard N2, Cr-Steel, HRc: 50-52, Draft 1° Clamping force: +/-22 at 500 bar Volume: 7,7 cm ³ Surface: 44,1 cm ² | 127x13x0,75 |  |  |
| Farbmusterplatten | • visual inspection | Gate according Axxicon Design Surface polished: Standard N1, Cr-Steel, HRc: 50-52, Draft 10° Clamping force: +/-54,3 T at 500 bar Volume: 24,9 cm ³ Surface: 108,71 cm ² | 90x55x2 |  |  |

| Type | Application | Description | Dimension [mm] *) | Design Insert | Design Specimen |
|----------------------------------|---|---|-------------------|---------------|-----------------|
| Colour plaque / step chip plaque | <ul style="list-style-type: none"> visual inspection optical tests | Gate according Axxicon Design Surface polished: Standard N1, Cr-Steel, HRc: 50-52, Draft 10° Clamping force: +/-55 T at 500 bar Volume: 25,17 cm³ Surface: 109,95 cm² | 90x55x(2+1,2,3) | | |
| Step chip plaque | <ul style="list-style-type: none"> visual inspection optical tests | Gate according Axxicon Design Surface polished: Standard N1, Cr-Steel, HRc: 50-52, Draft 10° Clamping force: +/-55 T at 500 bar Volume: 25,19 cm³ Surface: 109,95 cm² | 90x55x(1,2,3) | | |
| *) | <ul style="list-style-type: none"> all dimensions can also be customised on request (L / W / D) all inserts can optionally be finished with a surfacen treatment or a coating the cavities of the plaques can be provided with a texture, an eroded (VDI) or a matt surface, a logo or, if desired, with a chain hole All inserts can be equipped with a runner switch or a runner block if required. | | | | |

Other possible special designs of inserts/mirrors (example constructions):

| Type | Application | Description | Design Insert / Mirror |
|-----------------------------|--|---|------------------------|
| Colour plaque | <ul style="list-style-type: none"> visual inspection optical tests | Cavity with 8 different inserts / Surface with various textures / VDI-Codes; Insert 234 or 271 mm, enlarged mirror plate is needed | |
| Colour plaque | <ul style="list-style-type: none"> visual inspection optical tests | Cavity with big plaque, Surface with various textures / VDI-Codes; Insert 234 or 271 mm, enlarged mirror plate is needed | |
| Small circular plaques | <ul style="list-style-type: none"> mechanical tests | Cavity with 4 small circular plaques, Surface polished, Standard N1 Insert Standard (196 mm) | |
| Step plaque | <ul style="list-style-type: none"> various | XXL-insert with 2 cavities and multigating | |
| 2K-moulding Overmoulding | <ul style="list-style-type: none"> various Delamination tests | Standard- or enlarged insert with modified mirror plate, with vacuum if needed | |
| Injection Compression | <ul style="list-style-type: none"> various | Standard- or enlarged insert with modified mirror plate, with vacuum | |

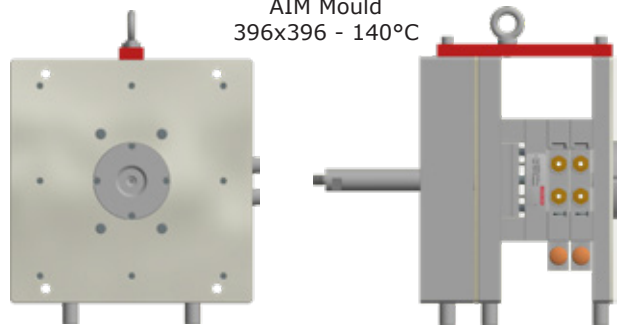
Electrically heated AIM-Mould



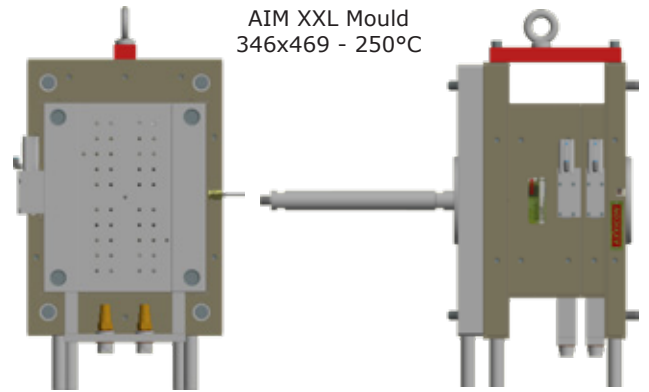
Special solution for limited installation conditions:

AIM Mould mounted on a 2 tie bar 25 To-injection moulding machine

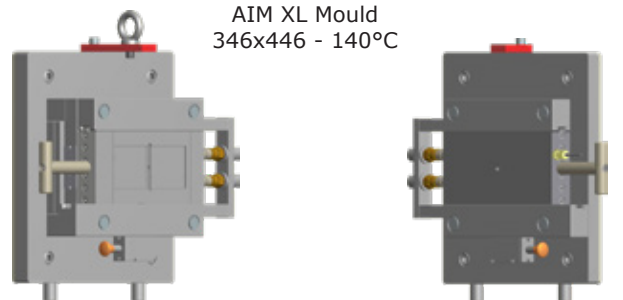
AIM Mould
396x396 - 140°C



AIM XXL Mould
346x469 - 250°C



AIM XL Mould
346x446 - 140°C



Technical data:

| | AIM™ - XS | AIM™ - Standard | AIM™ - XL | AIM™ - XXL |
|--|-------------|-----------------------------------|----------------------------|----------------------------|
| Design | horizontal | horizontal / vertical | horizontal / vertical | vertical |
| Mould Dimension | | | | |
| Height Euromap / SPI [mm] | 156 | 346 / 296 | 446 | 496 |
| Depth Euromap / SPI [mm] | 156 | 223 | 261 | 261 |
| Width Euromap / SPI [mm] | 140 | 296 / 296 | 396 | 346 |
| Temperature range [°C] | 140 | 100 / 140 / 250 | 100 / 140 / 250 | 100 / 140 / 250 |
| Weight [kg] | 19 | 90 / 85 | 165 | 200 |
| Mirror plate / insert Dimension | | | | |
| Width [mm] | 65 | 100 / 120 | 140 | 183 |
| Length [mm] | 126 | 196 / 234 / 271 | 296 | 346 |
| Thickness [mm] | 25 | 38 / 50 | 50 | 60 |
| Weight [kg] | 1,6 / 1,5 | 5 ... 11 | 15 | 22 |
| Mounting requirements | | | | |
| Platen size Euromap / SPI [mm] | 156 x 156 | 346 x 296 / 296 x 296 | 446 x 396 | 496 x 346 |
| Mould height [mm] | 140 | 223 | 261 | 261 |
| Hole pattern Euromap / SPI (v/h) [mm] | 60 x 140 | 280 x 140/210 / 250-254 x 250-254 | 350 x 280 | 420 x 280 |
| Bolt size machine [mm] | M10 | M12 / M16 | M16 | M20 |
| Connection cooling / heating | Water / Oil | Water / Oil / Electrically | Water / Oil / Electrically | Water / Oil / Electrically |

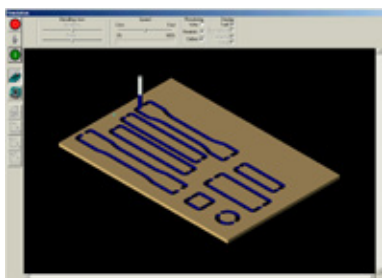
CNC MILLING MACHINE

CNC Milling Machine type C4U / C2U

Automatic, microprocessor-controlled CNC specimen milling machine (cutter), for the production of standardized or not standardized specimens.

Features / Equipment:

- 3-Axis (X,Y,Z) milling table (T-slot) with a large working area
- Various clampings for plates, semifinished parts, pipes, etc. for the production of standardized specimens are available
- Quick release clamp for the production of notched specimens are available
- User friendly 2 or 3D-Software (CAD/CAM software) for the programming and controlling of the milling procedure



Technical data:

| | C4U | C4U-HF | C2U | C2U-HF |
|-------------------------------------|--------------|--------------|--------------|--------------|
| Article Number | 2110.000 | 2120.000 | 2210.000 | 2220.000 |
| Dimensions | | | | |
| Width [mm] | 620 | | 985 | |
| Height [mm] | 730 | | 1070 | |
| Depth [mm] | 850 | | 1300 | |
| Weight [kg] | 81 | | 170 | |
| Distance in X [mm] | 310 | | 600 | |
| Distance in Y [mm] | 220 | | 420 | |
| Distance in Z [mm] | 160 | | 280 | |
| Table size [mm] | 375x320 | | 640x680 | |
| Clear width between d. Columns [mm] | 450 | | 810 | |
| Clear width under traverse [mm] | 115 | | 250 | |
| Clear width under spindle [mm] | 165 | | 285 | |
| Characteristics | | | | |
| Max. Feed speed [mm / s] | 100 | | 100 | |
| Max. Infeed speed [mm / s] | 100 | | 100 | |
| Torque standard motor [Ncm] | 90 | | 90 | |
| Power standard spindel [W] | 800 | - | 800 | - |
| Power HF-spindel [W] | - | 1100 | - | 1100 |
| Rotational speed (adjustable) [Upm] | 8000...24000 | 6000...24000 | 8000...24000 | 6000...24000 |
| Electrical data | | | | |
| Mains connection [V] / [Hz] | 230 / 50-60 | | 230 / 50-60 | |
| Power [W] | 850 | 1150 | 850 | 1150 |

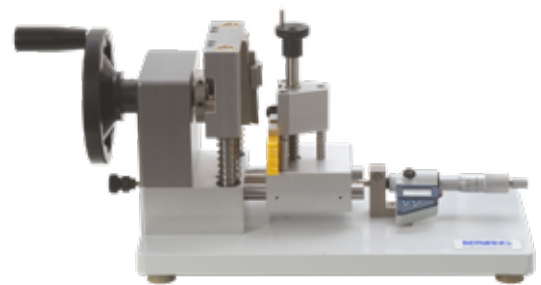
NOTCHING MACHINES

Manual and motorized Notching Machines type MAK and MOK

These linear notching machines (manual and motorized version) are developed to prepare, rapidly and accurately, V- or U- notched specimens for impact resilience determinations according to Charpy, Izod and Tensile Impact (ASTM, ISO, DIN or others). Therefore these machines are used in conjunction with impact pendulums. Interchangeable notching knives are designed with a constant profile to notch the specimens with the correct angle and radius as prescribed by the standards. The machines are fitted with two separate motion systems: one to move the specimens and the other to move the knife; the motorized machine has got a frequency controller for an adjustable speed.

Features / Equipment MAK:

- Robust and stable instrument
- Manual actuation by means of crank mechanism
- Precise and stable knife guiding
- Knife tolerances better than 0.01 mm
- Maximum clamping height: 30 mm
- Frictionless and clearance free bearings at loader guiding warranty a very precise and reproducible notch
- Optional: device for dynstat specimen
- Optional: device / adapter for fracture mechanics
- Optional: razor notch



Features / Equipment MOK:

- Robust and stable instrument
- Motorized knife movement
- Knife velocity adjustable by means of a frequency controller
- Plexiglas protection cover with integrated safety switch
- Maximum clamping height: 30 mm
- Optional: device for dynstat specimen
- Optional: device / adapter for fracture mechanics
- Optional: razor notch



Technical data:

| | MAK | MOK |
|---|---------------------|---------------------|
| Article Number | 2600.000 / 2650.000 | 2700.000 / 2750.000 |
| Characteristics | | |
| Max. Number of test specimens to be notched | 7 | 7 |
| Electrical data | | |
| Rated Voltage [V] | - | 230 |
| Power frequency [Hz] | - | 50 |
| Nominal power [kW] | - | 0.4 |
| Dimensions | | |
| Width [mm] | 470 | 470 |
| Height [mm] | 215 | 450 |
| Depth [mm] | 220 | 470 |
| Weight [kg] | 16 | 43 |

Automatic Notching Machine type AKM

This linear automatic notching machine is developed to prepare, rapidly and accurately, V-notched specimens for impact resilience determinations according to Charpy, Izod and Tensile Impact (ASTM, ISO, DIN or others). As an option, the machine can be equipped with a saw, which permits to separate the shoulders of the multipurpose test specimen. Interchangeable notching knives are designed with a constant profile to notch the specimen with the correct angle and radius as prescribed by the standards. The machines are fitted with two separate motion systems: one to move the specimens (z-Axis) and the other to move the knife and the saw (x-Axis). To ensure the greatest possible flexibility, the cutting and notching feed speed as well as the sawing rotating speed are adjustable in a wide range. A special cooling system ensures that even sensitive materials can be processed with the required precision. A new sealing system ensures that even abrasive or glass fiber-reinforced materials can be processed.

The user interface, a 7" touch screen, allows the programming of the notching or sawing cycles a simple and fast way. Repetitive processing cycles can be stored and are available when needed immediately.

Features / Equipment:

- Robust and stable instrument
- Precise guided movement
- Adjustable knife speed
- Adjustable saw rotating speed
- Plexiglas protection cover with integrated safety switch
- Dual knife and saw cooling
- 7" Touch screen, color
- Clear and easy to use user interface
- Programmable notching and sawing cycles



Technical data:

| | AKM |
|---|-------------------------------------|
| Article Number | 2900.000 / 2950.000 |
| Machine Data | |
| Max. Number of test specimens to be notched | approx. 51 (at 4 mm specimen width) |
| Feed saw, adjustable [m/min.] | 0.3 - 1.8 |
| Speed, adjustable [Upm] | 1000-2000 |
| Notch speed, adjustable [(mm/sec)] | max. 500 |
| Infeed depth Z axis (sample loader) [mm] | 0.001 - 0.3 |
| Working length [mm] | approx. 200 |
| Electrical data | |
| Rated Voltage [V] | 230/110 |
| Power frequency [Hz] | 50/60 |
| Nominal power [kW] | 1 |
| Dimensions | |
| Width [mm] | 1200 |
| Height [mm] | 700 |
| Depth [mm] | 540 |
| Weight [kg] approx. | 250 |

◆ COMPRESSION- / TENSION SET

Compression Set

Simple testing device for the determination of the compression set according to DIN ISO 815, DIN EN ISO 1856 and ASTM D 395

Features:

- DIN, ISO and ASTM conform
- Different geometries available
- 1- or 2 layer
- Heating oven upon request



Tension Set

Simple testing device for the determination of the tension set according to DIN ISO 2285

Features:

- DIN, ISO and ASTM conform
- Different geometries available
- Variable clamping length
- Heating-/cooling oven upon request

◆ STRESS CRACKING

Stress Cracking Tester

To determine the stability of polyethylene against stress corrosion in accordance with ASTM D 1693 - 70.

Features:

- Easy operating stress cracking tester
- Centering device for notching device
- Dial gauge for precise notching depth
- Transfer tool

Equipment comes with:

- sample holders and sample tubes
- Compact - thermostat with rack for the admission of sample tubes
- 1 notching device with blade
- 1 bending device
- 1 transfer tool



Bending device



Transfer tool



Notching device

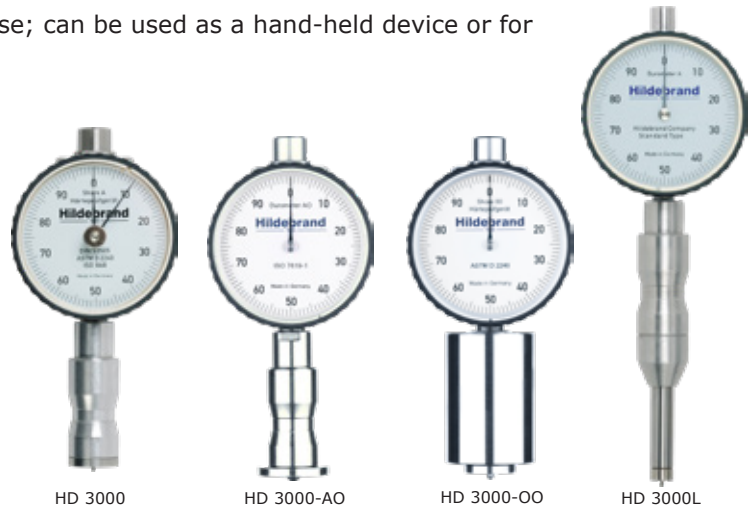
HARDNESS TESTER

Series HD 3000: SHORE-Hardness Tester with analog display

Low cost SHORE-Hardness tester for the universal use; can be used as a hand-held device or for series tests in the operating stand model OS-2.

Features:

- Drap pointer available
- Large dial surface
- Full 360° dial
- Superior 1/2 point accuracy
- Ergonomic handheld design
- Conform to DIN ISO 7619, ISO 868, ISO 7619 and ASTM D2240
- Special version „HD3000L“ for measurement in hard-to-reach places



Series HDD2: SHORE-Hardness Tester with digital display

The digital SHORE-Hardness tester for precise and reproducible measurements; can be used as a hand-held device or for series tests in the operating stand model OS-2 or OS-3.

Features:

- Conform to DIN ISO 7619, ISO 868, ISO 7619 and ASTM D2240
- Large LCD display
- Time set-up from 1 ... 99 s
- Resolution 0,1
- Superior 1/2 point accuracy
- Ergonomic handheld design
- AUTO-OFF function
- HOLD-function
- Low battery warning
- Data port: RS 232
- Windows compatible PC Software (multi lingual) real time visualisation, processing of results, etc.- optional



Options:

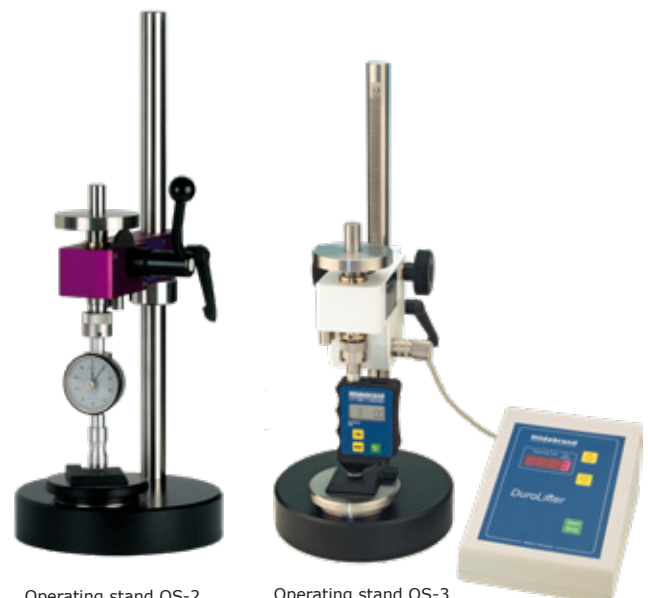
Operating stand OS-2

The Operating stand model OS-2 was developed for series testing in order to be able to determine accurate and reproducible results.

Subjective measurement errors caused by incorrect contact pressure or non-vertical measurement are eliminated.

Operating stand type OS-3

The durometer operating stand OS-3 is a fully automatic system for Shore hardness testing. The system consists of the operating stand and the DuroLifter control panel.



Technical data:

| | HD 3000 | HDD2 | OS-2 / OS-3 |
|-----------------------------|------------------|------------------------------|-------------------------------------|
| Description | | | |
| HardnessTester for SHORE | A,B,C,D,DO,O, OO | A,B,C,D,DO,O, OO and Asker C | A, AO, B,C,D,DO,O, OO ¹⁾ |
| Display | SHORE analog | SHORE digital | - |
| Characteristics | | | |
| Range [Shore] | 0 ... 100 | 0.5 ... 100 | |
| Accuracy [Shore] | ±0.5 | ±0.5 | |
| Resolution [Shore] | 1 | 0.1 | |
| Weight [kg] | 0.213 | 0.250 | 16.4 / 18 |
| Data port | - | RS232 | - |
| Dimensions | | | |
| Dial diameter [mm] | 57 | - | |
| Total length [mm] | 121 | - | |
| Width [mm] | - | 64 | |
| Height [mm] | - | 112 | |
| Depth [mm] | - | 26 | |
| Extension [mm] | - | - | 115 / 105 |
| Support table diameter [mm] | - | - | 98 |
| Max. sample thickness [mm] | - | ∞ | 180 |

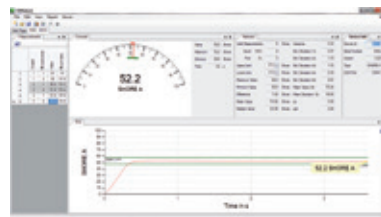
¹⁾ Special variant (OS-2-OO) excl. for SHORE OO measurements

Micro IRHD Hardness Tester

The MICRO IRHD SYSTEM provides hardness readings on elastomers according to MICRO IHRD. Recommended specimen thickness is 1 to 5 mm. It complies to international standards such as DIN ISO 48, ISO 48, ASTM D 1415 and BS 903:Part 26A.

Features:

- Automatic measurement
- Modular system
- Automatic table movement
- Built-in Auto-Diagnostics
- PC-controlled
- User friendly Windows Software



Options:

O-Ring centering device

The patented O-Ring Center Device fully automatically cooperates with the MICRO IRHD SYSTEM. O-Rings with a cord diameter of 0.6 mm to 8 mm will be placed on the measuring table and pushed to the positioning pin. The cord is keyed into the MICRO IRHD software. Integrated electric motors are exactly driving the measuring table to the measuring axis. This results in measuring the highest position of the O-ring.



X-Table centering device with sample holder

The centering device with sample holder fully automatically cooperates with the MICRO IRHD SYSTEM. This fixture is designed to measure O-Rings and round style parts. Each sample requires a sample holder which has an identification number. This number is keyed into the MICRO IRHD software. An integrated electric motor is driving the measuring table to the exact position of the measuring axis. After the first measurement, the sample holder can rotate to the next measurement at a different spot.



X-Table centering device

The X-Table centering device with digital gauge has to be used with the MICRO IRHD SYSTEM. This fixture is designed to measure small irregular parts. Two straight pins are used as rest positions for the sample. The sample can be easily fixed with modelling clay. The digital gauge enables exact measuring at the measuring axis e. g. the highest point of the sample.

Features:

- Digital gauge: 0...25 mm, resolution: 0.001 mm
- Standard sample holder: Exterior dia.: 50 mm, Matrix 5 mm x 5 mm, 60 holes dia. 2H7
- Connecting hole in base for sample holder: 8H7
- Sample holder is fixed with a straight pin preventing rotation



Prism centering device

The prism centering device is designed to measure hoses and cables and can be used with the following systems:

- Micro IRHD System
- IRHD N, H, L / Durometer Hardness System
- Durometer operating stands

Features:

- Fixture enables exact measuring at the measuring axis
- Exterior diameter of sample: 4...50 mm
- Centering prism is removable to measure bigger parts



Technical data:

| | Micro IRHD |
|---|-------------|
| Characteristics | |
| Resolution [IRHD] | 0.1 |
| Weight [kg] | 17.5 |
| Data port | RS 232 |
| Power supply [V/Hz] | 230 / 50 |
| Dimensions | |
| Measuring unit [mm] | Ø 200 x 470 |
| Controller | |
| Width [mm] | 290 |
| Height [mm] | 75 |
| Depth [mm] | 260 |
| Max. sample thickness without centering device [mm] | 90 |

◆ BALL REBOUND TESTER

Ball Rebound Tester

The ball rebound tester is used to determine the resilience of foam materials in accordance with DIN EN ISO 8307 and ASTM D 3574.

Features:

- Reliable, user-independent measurements
- Firmware controlled test cycle
- Test cycle, measured values, median value in %, status and operating instructions output to 4-line LCD
- Brief, precise test run according to standard
- Additional markings on the measuring column (1% interval)
- No calibration necessary
- USB port



Technical data:

| | Ball rebound tester |
|------------------------------|---------------------|
| Characteristics | |
| Max. specimen thickness [mm] | 160 |
| Measuring range [%] | 5 ... 100 |
| Accuracy | ±1 |
| Resolution [%] | 0,1 |
| Data port | USB |
| Dimensions | |
| Diameter [mm] | 200 |
| Height [mm] | 780 |
| Weight [kg] | 18,5 |

FRICITION PEEL TESTER

Friction Peel Tester Type 2260

High end friction peel tester according to ASTM D 1894, ASTM D 4521, ASTM D 3330, DIN EN ISO 8295, TAPPI T-816, BS 2782 and FINAT 1, 2, 3, 9.

The Friction/Peel tester has rapidly gained worldwide acceptance throughout industry and educational facilities as an accurate, reliable and easy-to-use instrument. Extremely versatile, this instrument measures static and kinetic coefficient of friction as well as peel properties of paper, paperboard, plastic films, adhesives, labels and packaging materials. Continuous software improvement has resulted in an enhanced testing instrument capable of measuring COF, 90° peel, 180° peel, T-peel and seal strength. The standard unit provides a load cell of choice (5N / 10N / 20N / 100N), a selection of sleds and peel clamps. The unit also provides data storage with statistics and a printer output. COF- and peel-settings are saved in memory for quick retrieval for future testing. A standard USB port provides result data and continuous curve data for PC interface.

Features / Equipment:

- Menu-guided one-hand operation
- Stand-alone instrument with multifunctional keyboard
- LCD display 240 x 64 mm
- Direct display of static and dynamic friction coefficient
- Automatic crosshead retraction
- Memory for 128 tests (COF, peel and pull)
- Selection of predefined parameter sets
- Limit switch, electrically monitored
- USB and RS-232 interface



Options:

- Software: Windows software for displaying the force/displacement or force/time curve (also for series tests), data backup, etc.
- Specimen clamps: mechanically acting clamping devices.
- Equipment for delamination tests: accessories for 90° peel tests on solid materials to determine the delamination resistance
- Accessories for 180° T-peel tests: 180° deflection unit for peel tests
- Accessories for 90° peel tests: 90° deflection unit
- Heating table: for measurements up to a temperature of 204°C



Technical data:**FP 2260****Characteristics**

| | |
|-----------------------------|---|
| Load cell range [g] | 500, 1000, 2000, 10000 |
| Force resolution [g] | 0,1 |
| Force accuracy [%] | 10 - 100%: $\pm 0,25$ < 10%: $\pm 0,025$ |
| Weight [kg] | 20 |
| Force Units | g, kg, oz, lb, N |
| Test times [s] | 0,1 ...99 |
| Standard COF sleds [g] | 200, 500, 1000, 3 lb |
| Speed [mm/min.] | 25,0 ...500 |
| High speed option [mm/min.] | 250 - 2750 |
| Power supply [V/Hz] | 110...230 / 50/60 |
| Data port | USB / RS 232 |

Dimensions

| | |
|-------------|-----|
| Width [mm] | 686 |
| Height [mm] | 178 |
| Depth [mm] | 305 |

ELMENDORF IMPACT TESTER

ProTear TearTester

The original Elmendorf design

Ergonomically designed for ease of operation and conservation of laboratory space, the ProTear Electronic Model incorporates both mechanics and electronics into a single footprint design. The ProTear Testers provide a rapid and precise way to evaluate the tear resistance of sheet materials including paper, textiles, roofing products, plastic film, and foils.

The electronic model features a touch-screen panel that allows for a simple one-touch process to run tear tests and track data. Two different pendulums are available with various augmenting weights. The ProTear Tester offers several capacity configurations. The MAP4 Software can be used to evaluate the sample test results. The dynamic tear data is calculated at every point of the test to allow for real-time data as the sample tears.

Software

- Test Results include tear strength, tear per ply, average tear strength and tear index.
- Quickly enter sample data - thickness, basis weight, sample ID, sample direction.
- Obtain results as percent of pendulum capacity, grams, pounds or millinewtons.
- Calculated Statistics - average, high, low, standard deviation, range & variance.
- Configurable results and reports.

Features / Equipment:

- Touch-screen menu
- Toolless easy mount pendulums and augmenting weights
- Electronic leveling sensor for accurate setup
- Configurable display for results and reporting
- Compatible with MAP4 Software for advanced analysis
- Multi-Port connections for data export
- One-touch pneumatic clamping and pendulum release
- Industry Standards: ASTM D295, D752, D4247, D1424, D1922, D5734, TAPPI T414, T496, BS 2782, 4253, 4468, CPPA D.9, DIN 53862, 53128, ISO 1974, 6383-2, 9290, EN21974, SCAN P11



Technical data:

| | ProTear Electronic |
|------------------------|--|
| Characteristics | |
| Capacity [g] | 200, 400, 800, 1600, 3200, 6400, 12800 |
| Accuracy | ± 0,2% |
| Data Interface | USB |
| Electrical data | |
| Rated Voltage [V] | 110....230 |
| Power frequency [Hz] | 50/60 |
| Nominal power [W] | 600 |
| Dimensions | |
| Width [mm] | 483 |
| Height [mm] | 584 |
| Depth [mm] | 406 |
| Weight [kg] | 16,8 |

◆ PENDULUM IMPACT TESTER

Pendulum Impact Tester type IMPact 5 / 5.5 / 25 / 50

The IMPact 5 - 5.5 - 25 - 50 pendulum impact tester are designed for the determination of impact strength / resilience on standardized specimen and test bars made of plastic.

These instruments are suitable for carrying out tests in accordance with the following standards:

- ISO 179 and 180
- DIN 53435
- ASTM D 256 Methods A and B
- ISO 8256 and others

Pendulums in the energy range from 0.5 to 5 J or 0.5 to 5.5 J (IMPact 5 or 5.5) as well as from 0.5 to 25 J / 50 J (IMPact 25 / 50) can be used for impact tests according to IZOD, Charpy, Dynstat and tensile impact on different materials with different sample dimensions. Various sample supports and clamping devices for different standard specimen dimensions are available.

For the configuration of a test sequence, data acquisition and evaluation, a PC can also be used using a comprehensive WINDOWS® software.

Features / Equipment:

- Full hammer range, from 0.5 J to 50 J for Charpy, Izod, Dynstat and Tensile Impact testes
- Microprocessor with LCD-Display
- USB interface for PC (depending upon instrument configuration)
- Automatic hammer brake (optional)
- Built-in centering system for Charpy and Izod specimens
- Direct reading of absorbed energy and resilience at the impact (depending upon instrument configuration)
- Auto hammer detection
- User friendly Windows Software for the control and evaluation, including statistic
- Protection shield



Izod vice



Charpy vice

Technical data:

| | IMPact 5 | IMPact 5.5 | IMPact 25 | IMPact 50 |
|-------------------------------------|-------------|-------------|-------------|-------------|
| Potential Energy [J] | 5 | 5.5 | 25 | 50 |
| Dimension | | | | |
| Width [mm], approx. | 690 | 880 | 1200 | 1200 |
| Height [mm], approx. | 700 | 950 | 1200 | 1200 |
| Depth [mm], approx. | 410 | 500 | 500 | 500 |
| Weight [kg] ¹⁾ , approx. | 70 | 140 | 220 | 500 |
| Electrical data | | | | |
| Rated Voltage [V] | 100 - 240 V | 100 - 240 V | 100 - 240 V | 100 - 240 V |
| Power frequency [Hz] | 50 - 60 | 50 - 60 | 50 - 60 | 50 - 60 |
| Nominal power [kW], approx. | 100 | 100 | 100 | 100 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ | 1~ | 1~ |
| Technical characteristics | | | | |
| Testing methods: | | | | |
| Charpy (ISO 179) | • | • | • | • |
| Charpy (ASTM D 6110) | | • | • | • |
| Izod (ISO 180; ASTM D 256) | | • | • | • |
| Dynstat (DIN 53435) | | • | • | • |
| Tensile Impact (ISO 8256) | • | • | • | • |
| Tensile Impact (ASTM D 1822) | | • | • | • |
| Units: metric / SI | • | • | • | • |
| Friction correction | • | • | • | • |

1) without accessories

IMPACT TESTER

Ball Drop

Easy operating falling dart instrument according ASTM D 1709 and ISO 7765-1.

This testing instrument covers the determination of the energy that causes plastic film to fail under specified conditions of impact of a free-falling dart. This energy is expressed in terms of the weight (mass) of the falling dart from a specified height which would result in 50 % failure of specimens tested.

Features / Equipment:

- Stable and ergonomic table design
- New Quick-Fix clamping system provides wrinkle-free clamping
- Easy and quick falling height adjustment by guiding lever arm
- Pre-leveled and ready to operate instrument
- No electrical power supply needed!

Options:

- Film roll for continuous testing



Technical data:

| | Ball drop |
|----------------------------------|-----------|
| Article Number | 4200.000 |
| Technical characteristics | |
| Compressed air connection [bar] | 6 |
| Dimension | |
| Width [mm] | 560 |
| Height [mm] | 2530 |
| Depth [mm] | 640 |
| Weight [kg] | 60 |

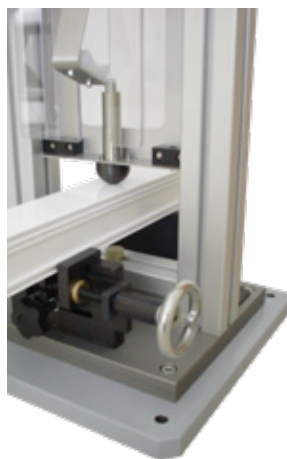
Falling Weight Tester

Easy operating falling weight tester according to RAL 716-1 and others.

This testing instrument is designed to perform biaxial falling weight tests on window profiles, frames, pipes, etc. according to different international standards.

Features / Equipment:

- Stable and ergonomic floor standing design
- Anti-rebound device prevents double impact on specimens
- Easy and quick falling height adjustment
- Self-centering specimen clamping device
- Different specimen vices available
- Variable dropping height



Technical data:

| | FWT |
|------------------|----------|
| Article Number | 4100.000 |
| Dimension | |
| Width [mm] | 450 |
| Height [mm] | 2500 |
| Depth [mm] | 600 |
| Weight [kg] | 75 |

HOT-TACK TESTER

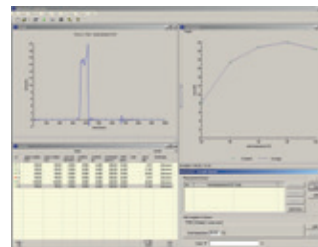
Hot-Tack Tester type HT5000

The Hot Tack Tester is a highly sophisticated instrument for testing sealing properties of packaging material according to ASTM F 1921-98.

It is being used in research and development as well as in SQC/SPC applications for raw materials, semi-finished goods and finished packaging products. The Hot Tack Tester permits evaluation of sealability and hot tack under a broad range of testing conditions to optimize packaging machine settings and to ensure consistent quality of the product. The instrument is also a practicable and helpful tool to packaging material manufacturers and end-users for incoming material inspection and for obtaining optimal production line speed.

Features / Equipment:

- Maintenance free
- Hot tack, peel only, seal only and rigid sample mode (optional)
- Pneumatic protection plates for easy cleaning
- Starting seal pressure of 0.05 N/mm²
- Minimum sample size 250 mm
- Maximum peeling distance 130 mm
- Optional Build-in tablet computer
- Optional seal bar 10 x 50mm (W x L)
- Optional higher force measurement up to 450N
- Optional sample feeder for full automatic measurements



Technical data:

| | HT 5000 |
|---------------------------------------|------------------------------|
| Sealing specification | |
| Sealing bars | "2 NIPTEF, 5 x 50 / 10 x 50" |
| Specimen width [mm] | max. 40 |
| Specimen thickness [mm] | max. 1 |
| Sealing time [s] | 0,1 ... 20 |
| Sealing temperature [°C] | 21 - 260 |
| Sealing pressure [N/mm ²] | 0,05 ... 2,0 |
| Peeling specification | |
| Cooling time [s] | 0,1 999 |
| Peeling speed [mm/s] | 8 ... 600 (optional 1000) |
| Peeling control | Servomotor |
| Specimen length [mm] | min. 250 |
| Hot tack force measurement | |
| Measurement range [N] | 0 ... 45 (optional 450) |
| Sampling speed [mm/s] | max. 20 |
| ADC resolution | 12 bit |
| Dimension | |
| Width [mm] | 220 |
| Height [mm] | 287 |
| Depth [mm] | 556 |
| Weight [kg] approx. | 14 |
| Connections | |
| Rated Voltage [V] | 90 - 264 |
| Power frequency [Hz] | 50/60 |
| Nominal power [kW] | 0.15 |
| Phase (Nominal voltage) [ph] | 1~ |
| Compressed Air [bar] | 6 - 8 |

UNIVERSAL TESTING MACHINES

Universal Testing Machines series „smarTens 2.5 IS“

Single ball screw drive with solid state servo and motor controls for loads upto 2.5 kN

High-precision single-column testing machine for strength tests in the lower load range. Developed for the most varied testing application in the laboratory, in production or in research and development. Due to the large number of available test programmes, almost all conceivable tests, such as tensile, compression or bending tests as well as pull-off, peel or shear strength tests are possible. The large application range of this machine allows tests in the load range up to 2.5 kN on plastics, elastomers, paper, wires, cords, foams, but also tests on finished parts. In combination with our powerful Windows® software, simple standard tests as well as user-specific tests can be carried out in a user-friendly and reliable manner.

Features / Equipment:

- Load range max. 2.5 kN
- Available in 3 different test area heights
- Innovative brushless motor without gear drive for long life
- Minimised noise emissions due to low motor speed and optimised frequency range
- Highly accurate force measurement: Class 1 from 0.1 % to 100 % nominal force according to DIN EN ISO 7500-1 or ASTM E4 (optional class 0.5)
- Testing speed from 0.0015 to 1200 mm/min
- Designed for standing or sitting work at the UTM
- Large machine base plate for mounting accessories and storing tools or samples
- User-friendly software



Technical data:

| | smarTens 2.5 IS-S | smarTens 2.5 IS-M | smarTens 2.5 IS-L |
|--|-------------------|-------------------|-------------------|
| Article Number | 4300-008-201 | 4300-008-211 | 4300-008-221 |
| Load range [kN] | 2.5 | 2.5 | 2.5 |
| Stiffness [kN/mm] | 2.7 | 2.7 | 2.7 |
| Dimension | | | |
| Width [mm] | 630 | 630 | 630 |
| Height [mm] | 700 | 1300 | 1600 |
| Depth [mm] | 630 | 630 | 630 |
| Weight [kg] approx. | 48 | 55 | 60 |
| Technical characteristics | | | |
| Working area depth [mm] | 105 | 105 | 105 |
| Working area height [mm] | 475 | 1075 | 1375 |
| max. test stroke (without tools, grips, adapter, load cell) [mm] | 350 | 950 | 1250 |
| Cross head speed range [mm/min] | 0,0015 - 1200 | 0,0015 - 1200 | 0,0015 - 1200 |
| Electrical data | | | |
| Rated Voltage [V] | 230 | 230 | 230 |
| Power frequency [Hz] | 50 | 50 | 50 |
| Nominal power [kW] | 0,5 | 0,5 | 0,5 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ | 1~ |

Universal Testing Machines series „smarTens 5/10 ID“

Two-spindle universal testing machine for a load range up to 5 or 10 kN

The two-spindle universal testing machine series smarTens ID has two backlash-free ball screws in H-frame design with spindle protection and innovative brushless drive motor. The newly developed testing machine is available in two different test testing area heights and can thus be optimally adapted to individual requirements. These models (table machines) are equipped with modern microprocessor technology and a universal testing software which allows strength tests on metals, non-ferrous materials, plastics, elastomers, wires, cords or foams. This testing machine series is mainly designed for standardised testing tasks according to national or international standards as well as for use in quality control.

Features / Equipment:

- Load range 5kN and 10 kN
- Available in 2 different test area heights
- innovative brushless drive without gear
- reduced noise pollution due to low motor speed and optimised frequency range
- freely selectable control of crosshead travel, force or elongation
- highly accurate force measurement by means of DMS load cell
- compact workplace design
- designed for standing as well as sitting activities due to very flat lower crossbar and lateral arrangement of the electronics
- Large machine base plate for the adaptation of accessories and the storage of tools or samples
- Variable speed upto 1200 mm/min.



Technical data:

| | smarTens 5-ID M | smarTens 5-ID L | smarTens 10-ID M | smarTens 10-ID L |
|---|--------------------|--------------------|---------------------|---------------------|
| Article Number | 4300-030-511 | 430-030-521 | 4300-030-611 | 4300-030-621 |
| Load range [kN] | 5 | 5 | 10 | 10 |
| Stiffness [kN/mm] | 11 | 11 | 11 | 11 |
| Dimension | | | | |
| Width [mm] | 804 | 804 | 804 | 804 |
| Height [mm] | 1305 | 1605 | 1305 | 1605 |
| Depth [mm] | 631 | 631 | 631 | 631 |
| Weight [kg] approx. | 83 | 88 | 83 | 88 |
| Technical characteristics | | | | |
| Working area width [mm] | 420 | 420 | 420 | 420 |
| max. test stroke (w/o tools, adapter and load cell) [mm] | 970 | 1270 | 970 | 1270 |
| max. test height (w/o tools, adapters and load cell) [mm] | 1025 | 1325 | 1025 | 1325 |
| Cross head speed range [mm/min] | 0,0015 - 1200 | 0,0015 - 1200 | 0,0008 - 600 | 0,0008 - 600 |
| Electrical data | | | | |
| Rated Voltage [V] | 230 | 230 | 230 | 230 |
| Power frequency [Hz] | 50 | 50 | 50 | 50 |
| Nominal power [kW] | 0,5 | 0,5 | 0,5 | 0,5 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ | 1~ | 1~ |

Universal Testing Machines series „smarTens 20/30“

Twin ball screw drive universal testing machine for loads up to 20 or 30 kN

The smarTens 20 / 30 kN materials testing machines were designed for standard and routine tests. These universal testing machines are used in quality assurance and are characterised by a particularly attractive price/performance ratio. The smarTens 20/30 is suitable for tensile, compression, peel and bending tests on different materials. In combination with the ergonomic design and the new brushless drive concept, a safe and fast measurement with easiest operation is guaranteed both in rough production environments and in sterile laboratories.

Features / Equipment:

- Load range max. 30 kN
- Innovative brushless drive without gears
- reduced noise due to low motor speed and optimised frequency range
- freely selectable control of crosshead travel, force or elongation
- high-precision force measurement by strain gauge force transducer
- designed for standing (with optional substructure table) and seated work
- ersatile adaptation of accessories and additional force transducers
- Variable speed up to 400 mm/min.



Technical data:

| | smarTens 020 | smarTens 030 |
|---|--------------|--------------|
| Article Number | 4300-030-209 | 4300-030-309 |
| Load range [kN] | 20 | 30 |
| Stiffness [kN/mm] | 35 | 40 |
| Dimension | | |
| Width [mm] | 790 | 790 |
| Height [mm] | 1420 | 1420 |
| Depth [mm] | 520 | 520 |
| Weight [kg] approx. | 140 | 140 |
| Technical characteristics | | |
| Working area depth [mm] | 420 | 420 |
| Working area height [mm] | 1005 | 1005 |
| max. test stroke (without tools, grips, adapter and load cell) [mm] | 1100 | 1100 |
| Cross head speed range [mm/min] | 0,0003 - 400 | 0,0002 - 240 |
| Electrical data | | |
| Rated Voltage [V] | 115/230 | 115/230 |
| Power frequency [Hz] | 50/60 | 50/60 |
| Nominal power [kW] | 0,5 | 0,5 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ |

Universal testing machines series „proTens“

Twin ball screw drive with solid state servo and motor controls for loads up to 250 kN

These universal tensile tester series “proTens” (table standing) incorporate an advanced microprocessor technology. In combination with our user friendly software we provide an extremely efficient, reliable approach to any materials testing need. Well-known for their versatile performance and rugged mechanical design, these machines are designed to accommodate a wide range of applications (e. g. quality and production control, R & D and test labs) to be able to meet the most demanding test requirements. It is designed to perform a variety of test procedures, including compression, tension, shear, peel and flex. The large application range permits testing of metals, plastics, elastomers, foam materials, wood, ropes, cords, wires as well as strength tests (tensile and compression tests) at finished parts.

Features / Equipment:

- Force range up to 250 kN
- Two different type of motor (300 W or 900 W)
- User-friendly software
- Cross head guidance system
- Quick-disconnect load cell and fixture system
- Adjustable overload stop
- Load measurement accuracy: Class 1 from 0,1 % to 100% of rated capacity acc. DIN EN ISO 7500-1 and ASTM E4 (optionally Class 0,5)
- Variable speed up to 2000 mm/min.
- Different test space widths (+ 190 / +330 / +620 mm) or test space heights (+250 / +500) are available for each machine type and can thus be adapted to almost all testing tasks or component geometries
- Expandable with temperature test chambers



Technical data:

| | proTens T3-005 | proTens T3-010 | proTens T3-020 | proTens T3-050 | proTens T9-010 | proTens T9-020 | proTens T9-050 | proTens T9-100 | proTens T9-250 |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Article Number | 4300-030-001 | 4300-030-101 | 4300-030-201 | 4300-030-501 | 4300-030-104 | 4300-030-204 | 4300-031-004 | 4300-031-104 | 4300-031-254 |
| Load range [kN] | 5 | 10 | 20 | 50 | 10 | 20 | 50 | 100 | 250 |
| Dimension | | | | | | | | | |
| Width [mm] | 685 | | | | | | 880 | | |
| Height [mm] | 1420 | | | | | | 1585 | | 2250*) |
| Depth [mm] | 550 | | | | | | 695 | | |
| Weight [kg] approx. | 100 | 100 | 130 | 150 | 100 | 130 | 320 | 400 | 570 |
| Technical characteristics | | | | | | | | | |
| Working area width [mm] | 420 | | | | | | 510 | | |
| max. test stroke (without tools, grips, adapter and load cell) [mm] | 1025 | 1025 | 1005 | 995 | 1025 | 1005 | 1095 | 1065 | 1030 |
| max. test height (without tools, grips, adapters and load cell) [mm] | 1080 | 1080 | 1080 | 1070 | 1080 | 1080 | 1170 | 1145 | 1110 |
| Cross head speed [mm/min] | 0.001-1200 | | 0.001-600 | 0.0005-250 | 0.005-2000 | | 0.001-800 | 0.0005-400 | 0.0005-175 |
| Electrical data | | | | | | | | | |
| Rated Voltage [V] / [Hz] | | | | | 230 | | | | |
| Power frequency [Hz] | | | | | 50/60 | | | | |
| Nominal power [kW] | 0.7 | | | | | | 1.5 | | |
| Phase (Nominal voltage) [ph] | | | | | 1~ | | | | |

*) incl. table

RMCi - Handpanel

Manual operation for all machines of the smarTens and proTens series with PC.

RMCi 6:

- Crosshead movement
- Stop, Return
- Display of current force and displacement values
- Mounting bracket for mounting on column profile Load frame 1+2, right side of machine
- Remote unit with 15 keys, DigiPoti and display and M12 interface
- OLED monochrom display with 128p x 64p and status LEDs
- Internal EDCi interface and protocol – supply voltag +24 VDC, RS485 communication
- Magnetic foil for easy fixation to testing machine chassis for comfortable use



RMCi 7: with EMERGENCY STOP, Function - necessary in safety door operation

- Crosshead movement
- Test start, stop, return
- Emergency stop button
- Opening and closing of extensometer arms and fixtures
- Display of current force and displacement values, storage and output of test results
- Parameterization of simple tensile compression and bending tests
- Mounting bracket for mounting on column profile, Load frame 1+2, right machine side
- OLED-Monochrom-Display with 128p x 64p und status-LEDs
- Internal EDCi interface und protocol – voltage supply +24 VDC, RS485 communication
- Magnet foil for easy fixation at the testing system for comfortable use

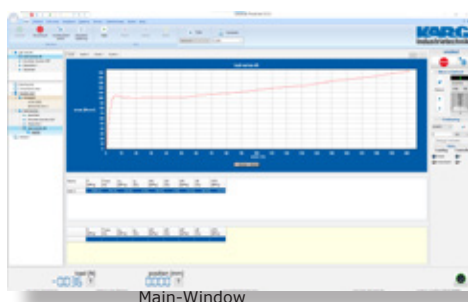


Software

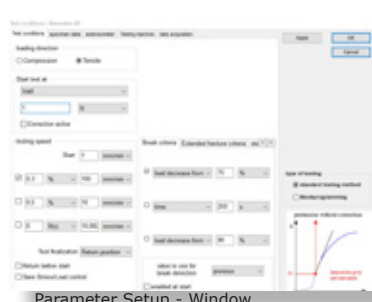
Our material testing software has been developed in a modular design and consists of a comprehensive basic software. This allows simple but also complex testing tasks to be configured in a standard-compliant or customer-specific manner. A large number of templates or pre-configured test parameter sets are available for standardised and standard-compliant test tasks. In addition and for the individual creation of test cycles, a freely programmable software (block program creation) with the following features is available:

- Free programming of a sequence control for static or dynamic tests
- Individual definition of test parameters including calculation / display of test results (force, displacement, strain or any other measured values such as temperature, weight, etc.)
- All test results can be converted with arithmetic formulas.

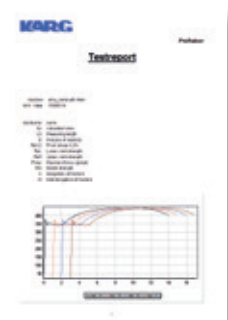
The integrated test wizard can be used to configure the test sequence individually, so that the user only has to operate the necessary input windows, receives supporting information and can work through his tasks purposefully. Our software works under Microsoft Windows® and guarantees „Microsoft Office® compatibility“, i.e. all results can be exported to other applications such as Access®, Excel®, ASCII-file or other SQL applications. The integrated report generator allows individual report generation including graphical display in single or series mode. The software is available in different languages.



Main-Window



Parameter Setup - Window



Report-Editor / Print out

EXTENSOMETER

Clip-on extensometer series MFA and Mini MFA

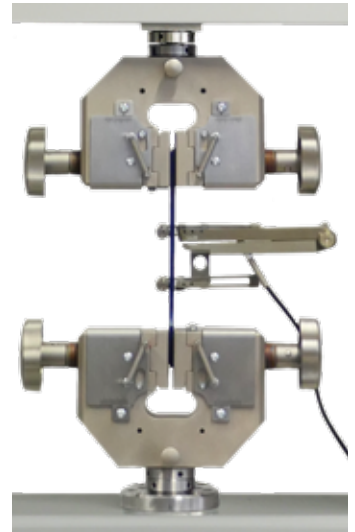
The Clip-On extensometer MFA and MiniMFA is equipped with a linear strain gauge measuring system. Its measuring accuracy exceeds all requirements by the standard EN ISO 9513. It is suitable for all tests starting from an initial gauge length of 10 mm. Its design, which has been tried and tested over many years of use, guarantees a high level of reliability and a long service life even under difficult operating conditions. The Clip-on extensometer are particularly suitable for determining the module of elasticity, proof stress and ultimate strain. The operation is quick, straightforward and easy, and therefore enables efficient tests of a large number of items.

Features / Equipment:

- Accuracy class 0.5 or 0.2 (EN ISO 9513)
- Measuring length from 2 mm to 25 mm (depends on version)
- Gauge length from 10 mm
- Low weight but solid construction
- Easy changing of extended measuring arm (gauge length)
- Adjustable clamping force
- Low activating force



MFA 25 (25 mm measuring length)

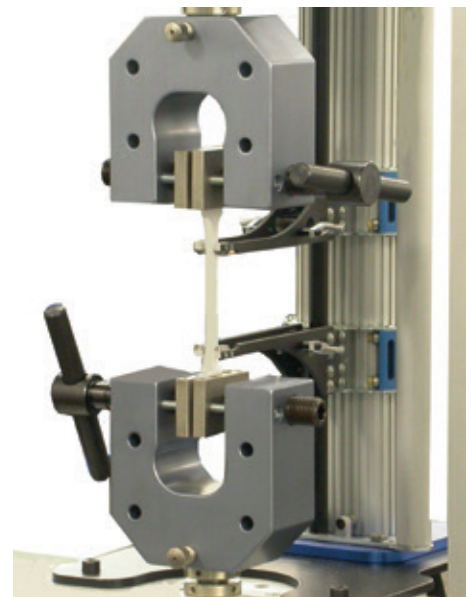


Extensometer series MFX

The extensometer MFX is suitable for almost all samples from a gauge length (L_0) of 10 mm. Because of its rugged construction and high accuracy the MFX nearly meets all applications in measurement of linear strain (determination of the E-modulus up to sample fracture). The MFX works without restrictions in both the upper as well as the lower testing area.

Features / Equipment:

- Accuracy class 0.5 (EN ISO 9513)
- Resolution max. $0.01 \mu\text{m}$ (1 Vpp) or $0.05 \mu\text{m}$ (RS422/TTL)
- Gauge length from 10 mm
- Automatic movement to the position and initial gauge length
- Automatic attachment on the specimen
- Measuring travel:
 - MFX 200: 200 mm
 - MFX 500: 500 mm
 - MFX 700: 700 mm
- Low activating force (max 10 cN)
- Operating range in upper and lower testing area possible
- Available also in high resolution ($0,01 \mu\text{m}$) version



Long stroke Extensometer L700 / L1100

The long stroke extensometer L700 / L1100 is particularly suitable for determining the elongation at break of plastics / elastomers with high elongation. The setting of the initial position (start position lower measuring arm) as well as the initial measuring length L_0 and the opening and closing of the measuring arms is done manually by the operator.

Features / Equipment:

- Accuracy class: 1 (standard) from 10 mm travel according to DIN EN ISO 9513
- Measuring principle: incremental
- Measuring path: 700 mm or 1100 mm $\cdot L_0$
- Resolution: 10 μm
- Temperature range: 10° ... 50°C
- Initial measuring length: $L_0 = 10/ 20/ 25/ 50/ 75/ 80/ 100 \text{ mm}$



Video extensometer ONE1

The video extensometer ONE employs the most advanced Digital Image Correlation technology reaching state of the art. Its ease of use and compactness make the ONE device currently the most Xsighting device for strain measurement.

ONE combines high-precision measurement with a user-friendly graphic interface to help focus on the experiment itself during tensile, compression, bending, shear, torsion, and fatigue testing.

Features / Equipment:

- Default single-cam measurement length: 240 mm (130 mm)
- Default resolution: ISO 9513: Class 1 (Class 0.5); ASTM E 83-10: Class B-1
- Gauge length: selectable single or multiple gauge lengths
- Data acquisition rate: 75-200 Hz
- Axial and radial neck detection
- Torsion testing
- Lighting: auto-switching light
- The devices are stackable. For longer specimen, two or three ONEs can be mounted next to or on top of each other.



ENVIRONMENTAL CHAMBERS

Environmental chambers

For tests in the temperature range from -70°C to $+250^{\circ}\text{C}$ with or without humidity, we supply temperature chambers (temperature kits) in proven industrial quality. Each temperature chamber is specially designed to meet the customer's requirements (max. elongation / travel, test fixture dimensions, max. temperature, handling, etc.) using standardised components.

Features / Equipment:

- Electrical resistance heating
- Cooling via CO_2 , LN_2 or compressor cooling (refrigerating machine)
- Microprocessor-controlled PID controller with RS 232 interface for temperature setting via software
- Fixed installation or rail system for extending the temperature chamber possible
- Temperature range -70°C to $+250^{\circ}\text{C}$ (optionally up to $+600^{\circ}\text{C}$)
- Retractable inserts (heated)
- Viewing window with interior lighting
- Slotted feed-through for external strain transducer



GRIPS / FIXTURES / VICES

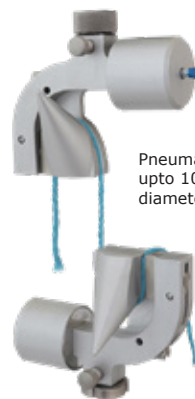
We offer a large range of specimen grips, fixtures, vices for almost any application. These devices are available in various designs, depending on the test load and test temperature used to cover a wide range of applications for the rubber and plastics testing.

Pneumatic grips

For low or medium test loads we offer different kind of pneumatically operated grips which are working single or double sided. The clamping jaws are exchangeable and available in different versions (shape, surface structure and material) to cover all needs to get a slipping free test.



small pneum. grip upto 200 N,
Jaw clamping surface 25x25 (50) mm



Pneumatic bollard grip,
upto 10 kN, specimen
diameter upto 3 mm



Pneumatic grip, clamping force 7 kN
Jaw clamping surface 40x60 (100) mm



small pneum. grip upto 100 N,
Jaw clamping surface 15x15 mm



smarTens 2.5 IS-L with pneum. grips for film testing

Screw grips

These screw grips are operated manually via screw drive principle. One gripping jaw can be set in a fixed position; the other jaw is operated by a screw drive. Different jaws (fixed or exchangeable) are available to cover different applications.



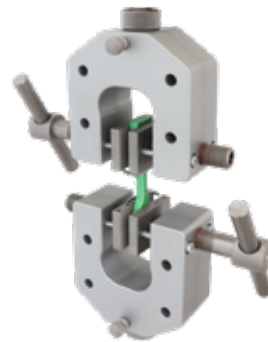
Yarn grip upto 2,5 kN



Small vice grip upto 100 N, Jaw clamping surface 15x15 mm



Vice grip upto 1 kN, Jaw clamping surface 30x30 mm



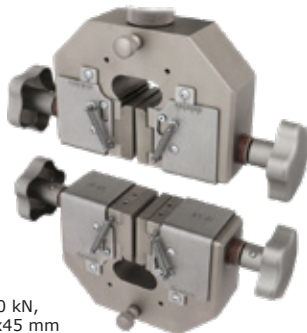
Vice grip upto 10 or 20 kN, Jaw clamping surface 40x60 (100) mm



Vice grip upto 5 kN, Jaw clamping surface 30x50 ...200 mm

Wedge grips

For medium or higher test loads we offer different kind of mechanically operated wedge grips which are actuated manually via a lever, which is pressed against the specimen. The preload is generated by spring inside the clamping system. During the test the gripping force increase with the increasing tensile force. The clamping jaws are exchangeable and available in different versions (shape, surface structure and material) to cover all needs to get a slipping free test.



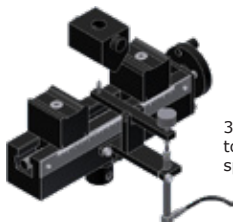
Screw wedge grip upto 10 kN, Jaw clamping surface 45x45 mm



Wedge grip upto 50 kN

Vices for flexural test

Flexure or bending (3- or 4 point) tests can be carried out in 3- or 4-point way. Depending on the standard and the dimensions of the specimens, we offer different tables with different span (adjustable) and heads with different radius.



3-Point bendig fixture with sensor to measure the deflection on the specimen



3-Point bendig fixture mounted on a 5 kN smarTens UTM

Further options:

- Devices for the determination of compressive properties of flexible materials according to ISO 604 and ASTM D 695
- Tools for the determination of the ball indentation hardness according to ISO 2039
- Devices for the determination of the static and dynamic coefficient of friction according to DIN 53375, ASTM D 1894, ISO 8295
- Tools for the determination of the puncture resistance according to ASTM D 5748
- Devices for 90° or 180° peel test
- Unit for the determination of the blocking load of plastic film by parallel platen method according to ASTM D 3354, ISO 11502

TERAOHMMETER

Teraohm- & Ampere-Meter Model TO-3 | Milli- & Tera-Ohmmeter Model mTO-3

Instruments for determination of resistive properties of insulating materials by using DC methodes

- Microprocessor-controlled instruments for determining the volume resistance as well as the surface resistance of insulating materials, non-metals or other materials. Measurement of resistivity and small currents is also possible. Resistance measuring range
- 1 k Ω ... 1,5 P Ω [TO-3]
- 10 $\mu\Omega$... 180 k Ω und 0,9 k Ω ... 1,6 p Ω [mTO-3]

Features:

- Aluminum cabinet with swivel-type handle
- 2 LC Displays with 2 lines each
- 7 measuring ranges, manual/automatic change over
- START & STOP buttons to release/end test procedure
- Controlling by instrument keys or RS232 interface
- Indication of critical values by beeper or relay output
- Voltage source: sustained short circuit-proof



Milli TO3

Optional Equipment:

- Guard ring electrodes acc. DIN IEC 60093, etc.
- Concentric ring probes acc. ESD STM11.11, etc.
- Shielded cabinets, high ohm test cables
- Low ohm clamps (Kelvin type), low ohm test cables
- 4-wire Kelvin type electrodes acc. DIN EN ISO 3915



TO3

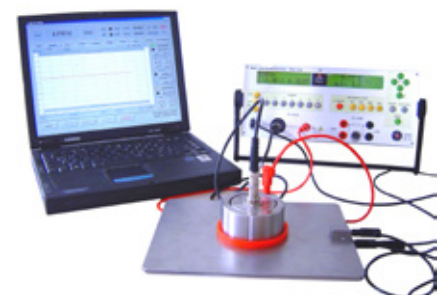
Test Standards & Regulations:

- IEC 62631-3-1:2016; IEC 62631-3-2:2015;
- EN 62631-3-1:2016; EN 62631-3-2:2016; ISO 10965;
- ASTM D 257; ANSI ESD STM11.11; DIN 53482

Options:

Protection ring electrode type SE 50

- Electrode for measurement of volume and surface resistivity according to DIN/ IEC 60093
- Inner measuring area: 1963,5 mm² (Ø 50 mm)
- Protection ring: Ø 80 mm AD, Ø 60 mm ID
- Resulting measuring gap: 5 mm
- Effective measuring area: 23,76 cm²
- Maximum measuring voltage: 500 V
- Further electrodes for measurements in the high-impedance or low-impedance range on request.



Testing setup with protection ring electrode SE50

Technical data:

| | TO-3 / mTO-3 |
|---|---|
| Characteristics | |
| Resistance measuring range (high ohm section) | 0.9 k Ω ... 1,6 p Ω |
| Number of ranges (automatic change over) | 8 |
| Number of ranges (manual change over) | 7 |
| Test voltage [VDC] | 10 / 100 / 500 & (1 ... 500) |
| Indication of test results (scientific notation) | 4 digit (e.g. 16.55 E9 = 16.55 G Ω) |
| Current measuring range | 0.01 pA ... 1.1 mA |
| Indication of test results (scientific notation) | |
| Additional Low Ohm Section | |
| | mTO-3 |
| Resistance measuring range (low ohm section) | 10 $\mu\Omega$... 180 k Ω |
| Number of ranges (manual / automatic change over) | 7 |
| General Electrical / Mechanical Data | |
| | TO-3 / mTO-3 |
| Mains voltage [VAC] | 115 / 230 , 50 / 60 |
| Mains connection | IEC Std. Socket |
| Electric plug (on detachable cord) | »Schuko« Type |
| Degree of protection (acc. EN 60529, VDE 0470-1) | IP 40 |
| Width [mm] | 340 |
| Height [mm] | 150 |
| Depth [mm] | 300 |
| Weight [kg] | 5.5 |

CTI TESTING INSTRUMENT

CTI / PTI Testing device according DIN EN 60112

Automatic test system for evaluating and measuring the electrical tracking properties of solid insulating material

Features:

- Fully CE compliant modular test system, consisting of - HV Test Cabinet with transparent safety doors - Controller / PSU Unit
- Determination of CTI – Comparative Tracking Index
- Determination of PTI – Proof Tracking Index
- Determination of erosion when required
- Adjustable test parameters: Test Voltage, Test Current, Drop Size, Switch-off Time, Number of Drops
- Lighting inside the cabinet
- Acoustic signal for End of Test
- Variant for tests according ASTM D3638

Test Standards & Regulations:

- DIN EN 60 112 / IEC 60 112 / VDE 0303 Part 1.
- ASTM D3638 (Alternatively)



Technical data:

| | CTI-04 |
|--|--------------------------|
| Characteristics | |
| Electrode Voltage [VAC] | 0 ... 600 |
| Current, indication range, LCD [A] | 0 ... 1 |
| Test Voltage, indication range, LCD [VAC] | 0 ... 600 |
| Mains voltage (nominal) | 230 1N~ (±10 %), 50 / 60 |
| Nominal Power [kW] | 0.5 |
| Dimensions / HV Test Cabinet | |
| Width [mm] | 610 |
| Height [mm] | 550 |
| Depth [mm] | 450 |
| Weight [kg] | 30 |
| Dimensions / Controller & Power Supply Unit | |
| Width [mm] | 610 |
| Height [mm] | 305 |
| Depth [mm] | 600 |
| Weight [kg] | 35 |

GLOSS METER

micro-gloss

Single angle gloss meters for specific applications

The micro-gloss has been the unsurpassed industry standard in gloss measurement for many years. The smart functions and intuitive menu operation with the brilliant color display make gloss measurement an easy task. Outstanding performance in temperature control and inter-instrument agreement guarantee always reliable QC. In addition, the smart-chart software is the ideal tool for smart communication with professional documentation and efficient data analysis.

- Excellent repeatability and inter-instrument agreement guaranteed
- Intelligent auto diagnosis guarantees always accurate readings
- Brilliant color display: easy to read - easy to use
- Statistics, Pass/Fail and Memory - ideal for QC and checks in the field
- Continuous mode to check uniformity over large areas
- smart-chart software: instant QC reports with trend graph and Pass/Fail limits

Features / Equipment:

- 20° for high gloss paint and plastic
- 60° for semi gloss paint and plastic
- 85° for low gloss paint and plastic
- 45° for ceramic and plastic films
- 75° for paper and vinyl siding



Standards:

- micro-gloss 20°, 60° and 85°: ISO 2813, 7668 / ASTM D 523, D 2457/ DIN 67530 / JIS Z8741
- micro-gloss 45° and 75°: ASTM C 346 (45°), D 2457, D 3679 (75°) / JIS Z8741 / TAPPI T480 (75°)

Technical data:

| | micro-gloss 20° | micro-gloss 60° | micro-gloss 85° | micro-gloss 45° | micro-gloss 75° |
|----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Characteristics | | | | | |
| Geometry | 20° | 60° | 85° | 45° | 75° |
| Application | high gloss | semi gloss | low gloss | Ceramic, Plastic, Film | Paper, Vinyl Siding |
| Measurement area [mm] (in) | 10x10 (0,4x0,4) | 9x15 (0,35x0,6) | 5x38 (0,2x1,5) | 9x13 (0,35x0,5) | 7x24 (0,3x0,95) |
| Measuring range | 0 - 100 GU 100 - 2000 GU | 0 - 100 GU 100 - 1000 GU | 0 - 100 GU 100 - 160 GU | 0 - 100 GU 100 - 180 GU | 0 - 100 GU 100 - 140 GU |
| Repeatability | ± 0,2 GU ± 0,2 % | ± 0,2 GU ± 0,2 % | ± 0,2 GU ± 0,2 % | ± 0,2 GU ± 0,2 % | ± 0,2 GU ± 0,2 % |
| Comparability | ± 0,5 GU ± 0,5 % | ± 0,5 GU ± 0,5 % | ± 0,5 GU ± 0,5 % | ± 0,5 GU ± 0,5 % | ± 0,5 GU ± 0,5 % |
| Measurement time [s] | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| Interface | USB | USB | USB | USB | USB |
| Power supply | 1,5 V Battery / USB-port | 1,5 V Battery / USB-port | 1,5 V Battery / USB-port | 1,5 V Battery / USB-port | 1,5 V Battery / USB-port |
| Dimensions | | | | | |
| Width [mm] | 155 | 155 | 155 | 155 | 155 |
| Height [mm] | 73 | 73 | 73 | 73 | 73 |
| Depth [mm] | 48 | 48 | 48 | 48 | 48 |
| Weight [kg] | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |

micro-gloss S-family

Gloss meters for toughest specifications

Features / Equipment:

- Improved repeatability and inter-instrument agreement for measurement of low gloss samples (< 20 gloss units)
- For any material: paint, plastic, leather or mirror-like metals



micro-gloss XS / XS-S

Small port for small parts

Features / Equipment:

- 60° geometry with 2x4 mm measuring area, ideal solution for small parts
- 60° XS-S version with improved repeatability and inter-instrument agreement for low gloss samples (< 20 gloss units)



micro-TRI-gloss

Three angle gloss meter - see gloss changes under the right angle

Features / Equipment:

- 20, 60 and 85° in one: from high to low gloss - have the specified angle on hand
- For any material: paint, plastic or even mirror-like metals
- All angles measure at the same location, and the results appear simultaneously



micro-TRI-gloss μ

Measure Gloss and Film Thickness at the same time - with one unit

Features / Equipment:

- Fast gloss and thickness control - at the same position
- 20, 60 and 85° for high gloss to matte coatings
- Fe/NFe sensor measures on ferrous and non-magnetic metal substrates



Standards:

- Gloss: ISO 2813 / ASTM D 523 / DIN 67530
- Film thickness: ISO 2178, 2360, 2808 / ASTM B499, D 1400

smart-chart Software

smart-lab Gloss

Features / Equipment:

- Powerful Standard Management to define tolerances and limits
- Export and import of digital standards among the entire supply chain for seamless communication
- Customer specific color scales are predefined
- Simultaneous display of results in a data table / graphs: scatter plot, line/travel diagram and spectral curves
- Easily toggle between measurement conditions: illuminant / observer – color equations
- Pass/Fail tolerances based on commonly available color difference methods or customer specific color scales
- Swap standard with sample and vice versa for ultimate flexibility
- Calculation of mean value based on a population of samples to be used as a new standard

smart-process Gloss

Features / Equipment:

- Powerful Standard Management to define tolerances and limits
- Customer specific color & appearance scales are predefined
- Specific algorithms to analyze different structure types: leather-like, coarse paint and fine textures
- Export and import of digital standards among the entire supply chain for seamless communication
- Organizers for clear sample identification and menu guided operation on the instrument
- Product schematics help to define sampling procedure
- Easy to read data table with Pass/Fail results highlighted based on tolerances set in Standard Management
- Test Report for harmony evaluation of a single test series
- Scorecard to give a quick overview how production is running over a certain time period
- Trend Report - typical process control chart showing data over time or by individual

Technical data:

| | micro-gloss 60° S | micro-gloss 60° XS | micro-gloss 60° XS-S | micro-TRI-gloss | micro-TRI-gloss μ |
|-------------------------------|---|-----------------------------|---|---|---|
| Characteristics | | | | | |
| Geometry | 60° | 60° | 60° | 20°, 60°, 85° | 20°, 60°, 85° |
| Application | semi gloss | semi gloss | semi gloss | universal | universal |
| Measurement area [mm] (in) | 9x15 (0,35x0,6) | 2x4 (0,08x0,16) | 2x4 (0,08x0,16) | see single angle | see single angle |
| Measuring range GU | 0 - 20 GU 20 - 100 GU 100 - 1000 GU | 0 - 100 GU 100 - 1000 GU | 0 - 20 GU 20 - 100 GU 100 - 1000 GU | 20°: 0 - 2000 GU 60°: 0 - 1000 GU 85°: 0 - 160 GU | 20°: 0 - 2000 GU 60°: 0 - 1000 GU 85°: 0 - 160 GU |
| Repeatability | ± 0,1 GU ± 0,2 GU ± 0,2 % | ± 0,2 GU ± 0,2 % | ± 0,1 GU ± 0,2 GU ± 0,2 % | 0 - 100 GU: ±0,2 GU 100 - 2000 GU: ±0,2% | 0 - 100 GU: ± 0,2 GU 100 - 2000 GU: ±0,2% |
| Comparability | ± 0,2 GU ± 0,5 GU ± 0,5 % | ± 0,5 GU ± 0,5 % | ± 0,2 GU ± 0,5 GU ± 0,5 % | 0-100 GU: ±0,5 GU 100 - 2000 GU: ±0,5% | ± 0,5 GU ± 0,5 % |
| Measurement time [s] | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| Substratum | | | | | Fe / NFe |
| Measuring range GU [μm] | | | | | 0-500 |
| Accuracy | | | | | ± (1,5 + 2 %) |
| Interface | USB | USB | USB | USB | USB |
| Power supply | 1,5 V Battery / USB-Port | 1,5 V Battery / USB-Port | 1,5 V Battery / USB-Port | 1,5 V Battery / USB-Port | 1,5 V Battery / USB-Port |
| Dimensions | | | | | |
| Width [mm] | 155 | 155 | 155 | 155 | 155 |
| Height [mm] | 73 | 73 | 73 | 73 | 73 |
| Depth [mm] | 48 | 48 | 48 | 48 | 48 |
| Weight [kg] | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |

TRANSPARENCY METER

haze-gard i

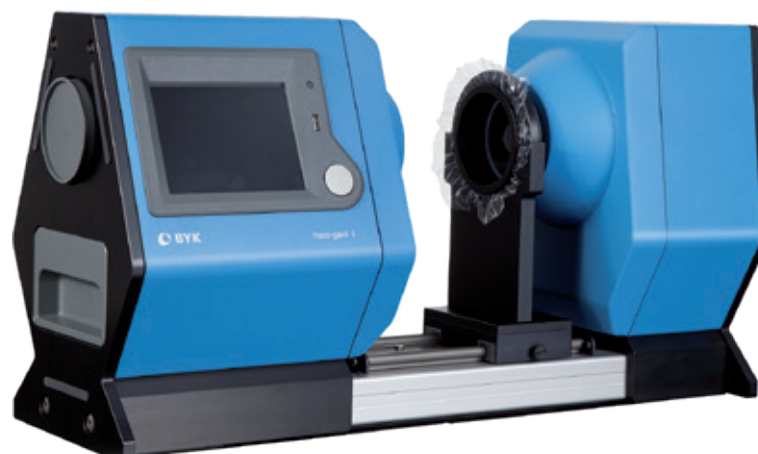
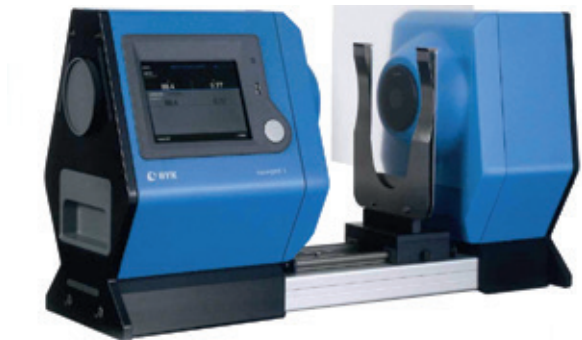
The objective standard for a clear view

Transparency of a product is influenced by the absorption and scattering behavior of the specimen. Visually transparency is described by two phenomena: Haze and Clarity.

The haze-gard i haze meter measures all transparency parameters in one instrument: total transmission, haze and clarity. Additionally, it simultaneously displays the results according to the ASTM and ISO standard test methods. The outstanding precision and reliability of the haze-gard i, as well as its ease of use, have made the haze meter the standard for transparency measurement in the glass, plastic, film and packaging industries.

Features / Equipment:

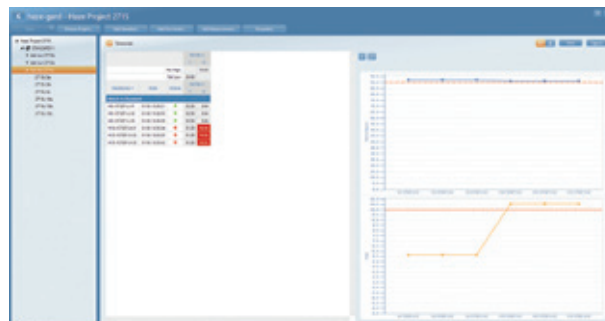
- Simultaneous measurement of haze and transmission according to
 - ASTM D1003 – illuminants C and A (non-compensated method)
 - ISO 13468 – illuminant D65 (compensation method)
- Open measurement compartment – quickly change and position small and large samples
- Reference beam, self-diagnosis and enclosed optics ensure precise and reliable readings - any time
- Automatic and long-term calibration allow easy and fast operation of the haze meter
- 10 year warranty on LED light source – long-term stable results for many years
- Versatile sample holders for films and sheets available
- Horizontal or vertical set-up - convenient sample handling for any application
- Foot switch for hands-free operation
- Large color touch display with symbols to select menu functions
- Complete statistics and colorful Pass/Fail analysis
- Direct data transfer via LAN, USB-port or via USB-stick
- Professional data documentation and analysis with smart-lab haze software



smart-lab haze Software

Features / Equipment:

- Product specifications are defined in standard management by setting up product groups with Pass/Fail limits
- Products can be measured online with instant display of QC reports: Data table with statistic and line graph including Pass/Fail coloring
- Data management in projects using trend reports to show production process stability
- Product specs and projects can be transferred to haze-gard i and vice versa



Standards:

ASTM D1003, D1044 / ISO 13468, ISO 14782



Technical data:

| | haze-gard i |
|------------------------|---|
| Characteristics | |
| Geometry | 0°/diffuse |
| Measuring field [mm] | Ø 18 |
| Sample port [mm] | Ø 25,4 |
| Measuring range [nm] | 0 - 100 % |
| Repeatability | ± 0,1 units |
| Comparability | ± 0,4 units |
| Illuminants | CIE-C, CIE-A (ASTM D1003), CIE-D65 (ISO 13468, ISO 14782) |
| Color Matching | CIE luminosity function y |
| Memory | 5000 readings |
| Data Interface | LAN, USB 2.0, additional front USB-port for memory stick |
| Power supply | 115/230 V, 1~ self adapting |
| Dimensions | |
| Width [cm] | 62 |
| Height [cm] | 33 |
| Depth [cm] | 22 |
| Weight [kg] | 18 |

◆ COLOR METER

spectro-guide / color guide

Color and gloss measurement for basic applications

Visual colour sampling is subjective and depends on the environmental conditions. The spectro-guide and colour guide are easy-to-use instruments to objectively measure colour and gloss against physical standards and document the results in EXCEL. The S family has improved technical performance for gloss (< 10 GU), ideal for low gloss applications.

- Colour and 60° gloss measurement in one instrument
- Easy handling due to defined keys for standard and sample measurement
- Innovative LED technology ensures long-term and temperature-stable measurement results
- Stable calibration - only necessary every three months
- Low maintenance
- Data transfer to easy-link for simple documentation in EXCEL

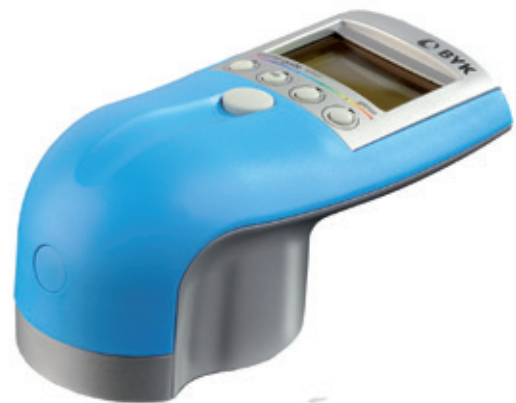


spectro-guide 45/0 gloss (S)

- 45/0 Measuring geometry
- Complete appearance control - colour and gloss in one unit
- Highly repeatable results on textured surfaces thanks to patented true circumferential illumination
- S-version: Improved technical performance for 60° gloss < 10 GU

spectro-guide sphere gloss (S)

- d/8 measurement geometry spin (gloss included)
- Complete appearance control - colour and gloss in one unit
- Highly repeatable results on textured surfaces thanks to diffuse sphere illumination
- S-version: Improved technical performance for 60° gloss < 10 GU



color-guide 45/0

- 45/0 measurement area:
 - 4 mm aperture for small parts
 - 20 mm glass sealed aperture for granular and powdery material



Standards

- Color: ASTM D 2244, E 308, E 1164 / DIN 5033, 5036, 6174 / DIN EN ISO 11664
- Gloss: ASTM D 523, D 2457 / DIN 67530 / ISO 2813, 7668

easy-link Software
Features / Equipment:

- Easy and direct data transfer from the spectro-photometer to predefined color control templates
- CIELab graph to show at one glance whether all parts are within specification
- Trend graph to monitor process changes over time
- CIELab graph for three illuminants
- Easy standard management:
 - Manual entry of spectral data if the physical standard is not longer available
 - Standard data back-up for download to the spectrophotometer
- Auto tolerancing function for assistance in setting up Pass/Fail limits

Technical data:

| | spectro-guide 45/0 gloss | spectro-guide 45/0 gloss S | spectro-guide sphere gloss | spectro-guide sphere gloss S | color-guide 45/0 4 mm | color-guide 45/0 Glass panel |
|-----------------------------|---|-----------------------------|-----------------------------|------------------------------|----------------------------|------------------------------|
| Characteristics | | | | | | |
| Geometry colour | 45/0 | 45/0 | d/8 spin | d/8 spin | 45/0 | 45/0 |
| Geometry gloss | 60° | 60° | 60° | 60° | - | - |
| Measurement area color [mm] | Ø 11 | Ø 11 | Ø 11 | Ø 11 | Ø 4 | Ø 20, Glas panel |
| Measurement area gloss [mm] | 5x10 | 5x10 | 5x10 | 5x10 | - | - |
| Colour | | | | | | |
| Measuring range [nm] | 400-700 | | | | | |
| Repeatability | 0.01 ΔE^* (10 consecutive measurements on white) | | | | | |
| Comparability | 0.2 ΔE^* (average on 12 BCRA II tiles) | | | | | |
| Color systems | CIE Lab/Ch; Lab(h); XYZ; Yxy | | | | | |
| Color differences | ΔE^* ; $\Delta E(h)$; ΔE_{FMC2} ; ΔE_{94} ; ΔE_{CMC} ; ΔE_{99} ; ΔE_{2000} | | | | | |
| Indices | YIE313; YID1925; WIE313; CIE; Berger; Color strength; Opacity; Metamerism | | | | | |
| Illuminants | A; C; D50; D55; D65; D75; F2; F6; F7; F8; F10; F11; UL30 | | | | | |
| Observer | 2°; 10° | | | | | |
| Memory | 1500 Standards; 999 Samples | 1500 Standards; 999 Samples | 1500 Standards; 999 Samples | 1500 Standards; 999 Samples | 200 Standards; 999 Samples | 200 Standards; 999 Samples |
| Gloss | | | | | | |
| Measuring range | 0 - 100 GU | 0 - 10 GU 10 - 100 GU | 0 - 100 GU | 0 - 10 GU 10 - 100 GU | - | - |
| Repeatability | ± 0,2 GU | ± 0,1 GU ± 0,2 GU | ± 0,2 GU | ± 0,1 GU ± 0,2 GU | - | - |
| Comparability | ± 1,0GU | ± 0,5 GU ± 1,0 GU | ± 1,0GU | ± 0,5 GU ± 1,0 GU | - | - |
| Power supply | 4 AA alkaline; NiCd or MH batteries | | | | | |
| Dimensions | | | | | | |
| Width [cm] | 9,5 | | | | | |
| Height [cm] | 8 | | | | | |
| Depth [cm] | 18 | | | | | |
| Weight [kg] | 0,5 | | | | | |

spectro2go / spectro2guide / spectro2guide Pro

spectro2go

Controlling the colour harmony of multi-component products within a global supply chain is a challenge. The outstanding technical performance of the spectro2go enables the use of digital standards. This ensures that everyone uses the same colour and gloss specifications.

- Colour and 60° gloss measurement in one instrument
- available in 45/0 geometry or as spherical spectrophotometer (d/8)
- Interchange of digital standards thanks to excellent instrument matching
- Balanced design with large, colour touch screen
- External test and calibration standards
- Live preview of the measurement spot with integrated camera
- Intelligent high-tech LED illumination with outstanding short-, long-term and temperature stability
- 10-year warranty on the LEDs - no lamp replacement necessary
- Professional data analysis with smart-chart combined with WiFi or USB connection

spectro2guide

spectro2guide represents the next step in the evolution of colour measurement. The device combines a spectrophotometer with a fluorimeter in one portable device. For the first time, colour and 60° gloss are measured and light fastness is predicted.

- Colour, gloss and fluorescence measurement in one device
- Smart docking station with intelligent auto-diagnostics that tell you when to calibrate
- Smart high-tech LED lighting with outstanding short-, long-term and temperature stability



spectro2guide Pro

with increased accuracy for measuring the black count of deep black colours (jetness)



Standards

- Color: ASTM D 2244, E 308, E 1164 / DIN 5033, 5036, 6174 / DIN EN ISO 11664
- Gloss: ASTM D 523, D 2457 / DIN 67530 / ISO 2813, 7668

smart-lab Software
Features / Equipment:

- Powerful standards management for setting tolerances and limits
- Export and import of digital standards within the supply chain ensures smooth communication
- Customised colour scales are predefined
- Simultaneous display of results as data table and graph: Lab graph, line/travel graph and spectral curves
- Easily switch measurement conditions such as illuminants and colour difference methods
- Pass/fail tolerances based on common colour difference formulas or custom colour scales
- Exchange of standard and sample guarantees highest flexibility
- Calculation of the mean value from a series of samples and use as a new standard

Technical data:

| | spectro2go 45/0 | spectro2go d/8 | spectro2guide 45/0 | spectro2guide d/8 | spectro2guide Pro 45/0 |
|-----------------------------|---|---------------------------|-------------------------------|------------------------------|-----------------------------------|
| Characteristics | | | | | |
| Geometry colour | 45/0 | d/8 (spin/spex) | 45/0 | d/8 (spin/spex) | 45/0 |
| Geometry gloss | 60° | 60° | 60° | 60° | 60° |
| Measurement area color [mm] | Ø 12 | Ø 12 | Ø 12 | Ø 12 | Ø 12 |
| Measurement area gloss [mm] | 5x10 | 5x10 | 5x10 | 5x10 | 5x10 |
| Colour | | | | | |
| Measuring range [nm] | 400-700 | | | | |
| Repeatability ¹⁾ | 0.01 ΔE* (10 consecutive measurements on white) | | | | |
| Comparability ¹⁾ | 0.1 ΔE* (average on 12 BCRA II tiles) | | | | |
| Color systems | CIELab/Ch; Lab(h); XYZ; Yxy | | | | |
| Color differences | ΔE*; ΔE(h); ΔEFMC2; ΔE94; ΔEcmc; ΔE99; ΔE2000 | | | | |
| Indices | YIE313; YID1925; WIE313; CIE; Berger; Color strength; Opacity; Metamerism | | | | |
| Illuminants | A; C; D50; D55; D65; D75; F2; F6; F7; F8; F10; F11; UL30 | | | | |
| Observer | 2°; 10° | | | | |
| Memory | 4000 Standards; 10.000 Samples | | | | |
| Gloss | | | | | |
| Measuring range | 0 - 10 GU 10 - 100 GU | 0 - 10 GU 10 - 100 GU | 0 - 10 GU 10 - 100 GU | 0 - 10 GU 10 - 100 GU | 0 - 10 GU 10 - 100 GU |
| Repeatability | ± 0,1 GU ± 0,2 GU | ± 0,1 GU ± 0,2 GU | ± 0,1 GU ± 0,2 GU | ± 0,1 GU ± 0,2 GU | ± 0,1 GU ± 0,2 GU |
| Comparability | ± 0,2 GU ± 1,0 GU | ± 0,2 GU ± 1,0 GU | ± 0,2 GU ± 1,0 GU | ± 0,2 GU ± 1,0 GU | ± 0,2 GU ± 1,0 GU |
| Power supply | integrated accu, 7.2 V, 2350 mAh 16.92 Wh, 100 - 240 V, 50/60 Hz | | | | |
| Fluoreszenz | | | | | |
| Measuring range [nm] | - | - | 340 - 760 | 340 - 760 | 340 - 760 |
| Fluoreszent Indices | - | - | ΔE FI, ΔEzero | ΔE FI, ΔEzero | ΔE FI, ΔEzero |
| Jetness Indices | - | - | - | - | My, Mc, dM, Gy, Gc, dG |
| Repeatability Jetness | - | - | - | - | ± 0,003 (for Y<0,5) |
| Dimensions | | | | | |
| Width [cm] | 11 | | | | |
| Height [cm] | 18,8 | | | | |
| Depth [cm] | 8,7 | | | | |
| Weight [kg] | 0,7 | | | | |

◆ LIGHT BOOTH

Light booth Series CM

Colors appear differently under different lighting conditions. Use of a light booth to simulate different lighting conditions will help to obtain an objective assessment of color, anytime, anywhere. We offer a light booth which creates defined lighting conditions independently of location and environmental influences.

Features / Equipment:

- Comparison of standard and sample in a color-neutral environment
- Five different controlled light sources
- Viewing under ultraviolet light to detect and evaluate optical brighteners or fluorescent pigments
- Addition of UV light to daylight or fluorescent light better approximates standard illuminants
- No warm-up time or flickering which ensures quick and reliable color judgement
- Economic power consumption and low heat generation for high light efficiency
- Diffusing panel to eliminate direct reflection
- Comfortable testing in a compact design – for laboratory and production
- Complies to ASTM D 1729



CM 25



CM mini 1

Technical data:

| | CM 20 | CM 25 | CM 30 | CM 35 | CM mini 1 | CM mini 2 | CM mini 4 |
|------------------------------------|---|---|---|---|--|--|------------------------|
| Dimensions | | | | | | | |
| Outside dimensions (HxWxD) in cm | 63 x 76 x 55 | 79 x 107 x 68 | 91 x 137 x 80 | 91 x 168 x 80 | 48 x 68 x 42 | 46 x 52 x 34 | 48 x 67 x 48 |
| Viewing area (HxWxD) in cm | 48 x 71 x 51 | 64 x 100 x 65 | 75 x 132 x 76 | 76 x 163 x 76 | 36 x 61 x 34 | 25 x 46 x 34 | 36 x 61 x 41 |
| Weight [kg] | 32 | 44 | 70 | 90 | 14 | 10 | 17 |
| Light sources | | | | | | | |
| Artificial daylight D 65 | • | • | • | • | • | • | • |
| Department store light TL 84 | • | • | • | • | • | • | • |
| Home light A | • | • | • | • | • | • | • |
| UV light | • | • | • | • | o | o | • |
| Office light TL83 | • | • | • | • | - | - | • |
| optionally exchangeable | e. g. CWF against TL83, D50 against D65 | e. g. CWF against TL83, D50 against D65 | e. g. CWF against TL83, D50 against D65 | e. g. CWF against TL83, D50 against D65 | e. g. TL83 against TL84, D50 against D65 | e. g. TL83 against TL84, D65 against D50 | e. g. TL83 against CWF |
| Electrical specifications | | | | | | | |
| Power [W] | 225 | 602 | 788 | 568 | 180 | 160 | 215 |
| Rated voltage [V] (± 10%) 50/60 Hz | 230 or 115 | 230 or 115 | 230 or 115 | 230 or 115 | 230 or 115 | 230 or 115 | 230 or 115 |

• (standard) o (optional available)

FIBER LENGTH ANALYSIS

FILDAS® - Test systems for fibre distribution analyses

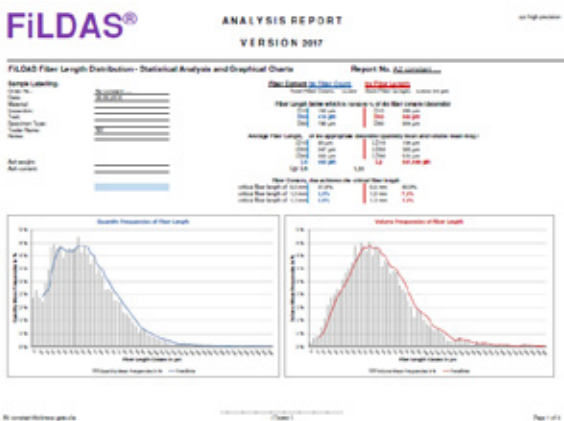
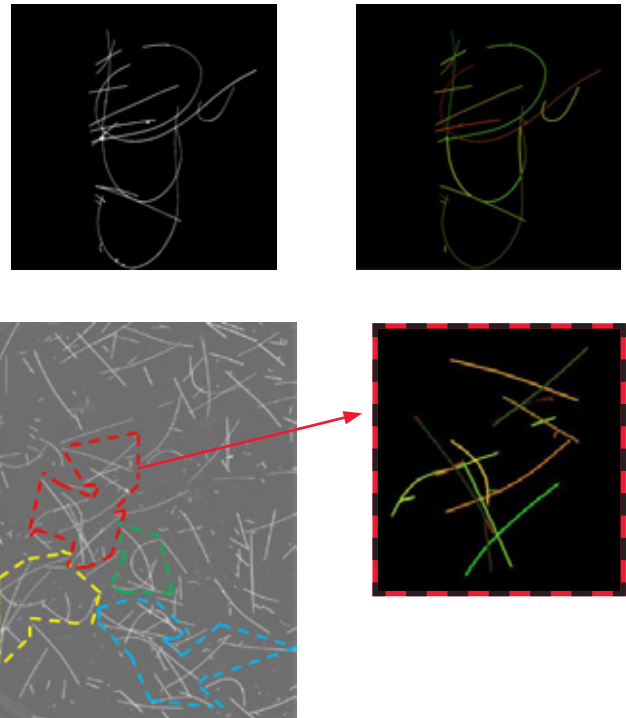
Important properties of injection moulded or extruded fibre composite plastic components are influenced by the effective length of the embedded fibres. The determination of the fibre length after the end of the process has therefore been part of the quality assurance of FRP processors as well as in the R&D sector for several years. However, previously available test methods were often very time-consuming and associated with certain limitations in terms of accuracy and practicality.

Many years of practical experience in the fields of systems engineering, digital image processing and physical-chemical laboratory analysis have gone into the Fildas instrument series. The powerful FiLDAS systems use an automated sequence of image acquisition, pattern recognition, classification and data analysis with report generation in Excel format.

The systems, which are available with dark-field and/or bright-field illumination, allow analyses of glass fibres, aramid fibres, natural fibres or carbon fibres, depending on the configuration.

Features / Equipment:

- Depending on the type of unit and the task, various analysis procedures with different degrees of automation are available
- Fully automated analysis, optimised for short (or straight) fibres
- Analysis of samples with ultra-long and/or crossed fibres / clusters
- Image acquisition using special scanner or DigiMic systems
- Test report, automatically generated (diagrams and data listings in Excel format)



Technical data:

| FILDAS® | |
|--|------------------------------|
| Scanner / software data | |
| Measuring range fiber length [μm], depending upon configuration | 4 ... 1000 20 ... 100.000 |
| Number of fibers / specimen | several 1000 |
| FOV (field of view) [mm], depending upon configuration | 3 x 4 \varnothing 90 |

PERMEATIONS TESTER

Permeability Tester TotalPerm - O₂, CO₂ & H₂O

TotalPerm is the only instrument on the market, based on patented technology, that performs permeability measurements on three different kind of gases. TotalPerm is offered with three different sensors for oxygen, carbon dioxide and water vapour. In this way TotalPerm has the ability to characterize the barrier properties of the film with three different gases testing exactly the same surface, avoiding the need of substituting the sample.

With this instrument it is possible to measure plastic films, monolayer or multilayer barrier films, metallized or with surface coating, laminated or coextruded, especially those used for food, beverage, pharmaceutical and electronics packaging applications. TotalPerm, as well as performing tests of permeability through thin films, can be equipped with modular accessories to carry out measurements on packaging containers of various types such as bag-inbox, PET bottles and packages. TotalPerm stands as the ideal solution for companies that produce or use barrier packaging and want the highest performance in a single instrument at competitive prices. The special software TotalPerm ExtraSolution® guarantees maximum simplicity of operation.

TotalPerm complies with the norms DIN 53380-3, ASTM D3985, F2622, F1927, F1307, JIS K-7126, ISO 15105-2 for OTR measurements, with the norm ASTM F2476 for CO2TR measurements and with the norms ASTM F1249, TAPPI T557, JIS K-1729, ISO 15106-2 for WVTR measurements.

Features / Equipment:

- 3 sensors inside
- Sequential analysis
- Broad measuring range
- Long life detectors
- Barometric compensation
- Graphic software interface
- Automatic humidity adjustment
- No sample cutting required

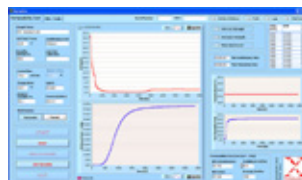
Other versions:

Multi-Perm with 2 sensors for O₂-CO₂, O₂-H₂O or H₂O-CO₂

Perme with 1 sensor for O₂, CO₂ or H₂O

CarboPack BT - Carbon dioxide permeability tester with embedded controls of temperature

PackPerm - Oxygen permeability tester for flexible packages, stiff containers and PET bottles



Technical data:

| | TotalPerm / MultiPerm / Perme |
|---|--|
| Characteristics | |
| Test range O ₂ | 0,01 - 1,000 cm ³ ·m ⁻² ·24h ⁻¹ ·bar ⁻¹ (unmasked) 0,2 - 25,000 cm ³ ·m ⁻² ·24h ⁻¹ ·bar ⁻¹ (masked) |
| Test range CO ₂ | 0,25 - 9,000 cm ³ ·m ⁻² ·24h ⁻¹ ·bar ⁻¹ (unmasked) 50 - 180,000 cm ³ ·m ⁻² ·24h ⁻¹ ·bar ⁻¹ (masked) |
| Test range H ₂ O | 0.002 - 100 g·m ⁻² ·24h ⁻¹ (unmasked) 0.04 - 2,000 g·m ⁻² ·24h ⁻¹ (masked) |
| Specimen size | 50 cm ² – max. approx. 2,5 mm thickness |
| Temperature range | 10 - 50 °C ± 0.1 °C |
| Relative humidity carrier side (O ₂ /CO ₂) | 0%, 30-90% |
| Relative humidity O ₂ /CO ₂ (gas test side) | 0%, 5 - 95% ±1.5% |
| Relative humidity H ₂ O (wet side) | 5 - 95% ±1.5% |
| Carrier Flow (N ₂) | 12 - 36 ml/min, automatically controlled |
| Carrier gas | N ₂ 5.0 + 1% H ₂ mix |
| O ₂ /CO ₂ /purity gas | Purity ≥99.95% / ≥99.99% |
| N ₂ pressure | 2.0 bar |
| O ₂ /CO ₂ pressure | 1.5 - 2.0 bar |
| Power supply | 110 - 220 AC 50 - 60 Hz |
| Apparatus size [cm] | 41W/61D/31 H |

FLAMMABILITY CHAMBER

Combustibility & Burning Behaviour

Tests for determining combustibility or burning behaviour of specimens and products are being performed as part of regulatory approval procedures, research, product development and quality assurance.

Please find below some typical tests for evaluating the risk of flammability and ignitability

Automotive Sector

- DIN 75200 / FMVSS 302 (ECE-Reg. No. 118 Annex 6) Determination of burning behaviour of interior materials in motor vehicles -> »Horizontal Burning Rate«
- UTAC Drip Test NFP92-506 (ECE Reg. No. 118 Annex 7) Determination of melting behaviour of materials
- DIN EN ISO 6941 (ECE Reg. No. 118 Annex 8) Measurement of flame spread properties of vertically oriented textile fabric »Vertical Burning Rate«

-

Building Materials & Products (-> DIN EN 13501)

- DIN EN ISO 11925-2 Single flame source test, ignitability when directly exposed to flame
- DIN 4102 B2 Single flame source test, classification of burning behaviour
- EN ISO 9239-1 / DIN 4102 P. 14 Reaction to fire tests for floorings, determination of the burning behaviour using a radiant heat source

Electrical Products & Appliances

- DIN EN ISO 60695-11-10, IEC 60695-11-10 procedure for comparing the relative burning behaviour of vertically or horizontally oriented specimens
- UL 94 Tests for Flammability of Plastic Materials for Parts in Devices and Appliances
- Glow wire test to assess the fire hazard according to DIN EN 60695-2-11 /-12 /-13 with DIN EN 60695-2-10 or VDE 0471-2-10 compliant test device

Electric Cables and Wires

- Evaluation of fire safety of electric cables
 - DIN EN 60332-1-2, IEC 60332-1-2
 - UL 1581
- Further devices for other fire or flammability tests on request.

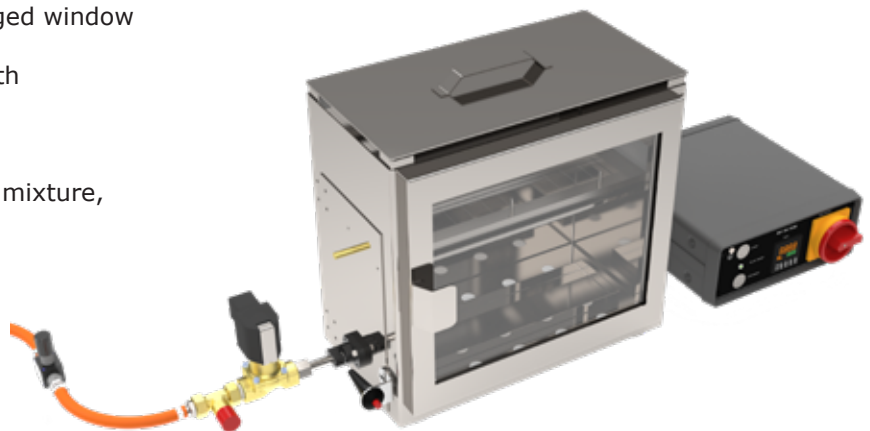
Flammability Test Chamber according to DIN 75200, FMVSS 302, etc.

Test to determine the horizontal burning rate

Fire test chamber BKF has been designed for evaluating the burning behaviour of interior materials in motor vehicles when exposed to a small igniting flame. The device is applicable for individual or combined tests of all materials and components of inside furnishing. Purpose of the fire tester is determination of horizontal burning velocity acc. DIN 75200 and other equivalent / harmonized international standards.

Features / Equipment:

- Flammability chamber (V4A) with hinged window
- Specimen holder A
- Specimen fixture B (cross-stringed with supporting wires)
- Fine adjustment valve and gas hose
- Collecting tray
- Burner (natural gas, methane/ethane mixture, propane)
- Flame safeguard



Optional:

- Sample holder TL 1010 (VW)
- Exchangeable cover for test device according to DIN 75200 with thermocouple with display (e.g. Nissan, Toyota)
- Control unit with timer for switching solenoid valve after preset interval (see adjacent illustration)

Test Standards & Regulations

- DIN 75200, PTL 8501, DBL 5307.10, FMVSS 302, NF ISO 3795, TL 1010 (with optional fixture), GB 8410 (with optional fixture), ECE-Reg. No. 118 Annex 6

Technical data:

| | BKF |
|---|-----|
| Dimensions | |
| Width [mm], incl. protruding components | 500 |
| Height [mm] | 385 |
| Depth [mm] | 245 |
| Weight [kg] | 22 |

Flammability Tester according to UL94 / IEC 60695-11-x

Combination unit for manual and semi-automatic adjustment

The flammability tester is suitable for performing standard-compliant burning tests according to the following standards: UL 94, ASTM D635, D3801, D4804, D5048, D4986, IEC 60695-11-3, IEC 60695-11-4, IEC 60695-11-10 (replaces ISO 1210), IEC 60695-11-20 (replaces ISO 10351), IEC 707 (partially); ISO 9772, ISO 9773

Features / Equipment:

- Robust combustion chamber with chamber walls made of blackened steel plates
- Ignition source for test flame
- Burner with shifting device and angle adjustment
- Two access holes in the front panel below the viewing window for manual tracking and adjustment of the burner
- Positioning system for specimen and burner for horizontal and vertical tests
- Sample holder for six Bunsen burner tests
- Flow meter and pressure regulator for gas integrated
- Stopwatch with resolution 0.1 s, start by automatic burner position recognition
- ASTM compliant flame calibrator with integrated temperature measuring module and exchangeable calibration sensors
- Gauges for sample cutting and flame adjustment
- Extraction fan, automatic interruption of gas supply when activated
- Interior lighting
- Test device on base frame / floor stand

Optional:

- Flame monitoring (safe guard)
- Set of measuring devices and gauges for tests according to DIN EN 60695-11-10
- Tightly closing shut-off damper for exhaust air spigots with motorised actuator

Alternatively:

- BK-UL 94 ECO (with manual adjustment / operation)



BK UL94



BK UL-94 ECO

Technical data:

| | BK-UL94 | BK-UL94 ECO |
|---------------------------------|-------------------------|-------------------------|
| Dimensions | | |
| Dimensions, WxDxH [mm] | 1170 x 770 x 1920 | 770 x 940 x 1170 |
| Weight [kg], approx. | 250 | 60 |
| Connection for exhaust air [mm] | Ø 200 | Ø 200 |
| Connection for gas [mm] | Ø 4 hose (back side) | Ø 9 hose (back side) |
| Power supply [V/Hz] | 230 (1N) / 50 (+/- 10%) | 230 (1N) / 50 (+/- 10%) |
| Power [W], approx. | 500 | 500 |

Flammability Tester according to DIN EN ISO 11925-2 and DIN 4102 B2

Combination unit consisting of burner chamber, basic unit, specimen holder and gas burner

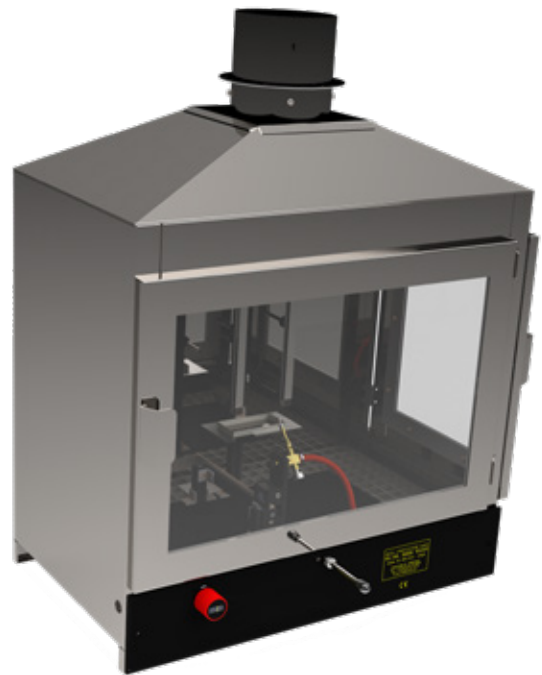
The flammability tester is suitable to perform standard-compliant combustion tests according to the following standards: DIN EN ISO 11925-2, DIN 4102-1 B2 und DIN 53438.

Features / Equipment:

- Combustion cabinet with fan to generate a defined air flow according to DIN 4102 or DIN EN ISO 11925-2:2020-07
- Exhaust air spigot Ø150 mm, centred on the roof of the cabinet
- Special glass window, front and narrow side

Instrument equipped with:

- Basic device
- Tripod
- Shifting device with tilting device 45
- Catch tray closed for EN 11925
- Wire mesh DIN 4102
- Bracket for lateral flaming
- Flame gauge 20 mm
- Adjustment tips for edge and surface flaming
- Fine adjustment valve with hose
- Specimen fixture BBK with template according to DIN 4102 B2
- Specimen fixture according to EN 11925-2 incl. sample template
- Specimen grips (vertical edge test) according to EN 11925-2
- Specimen fixture basket EN 11925-2 (for loose materials)
- Gas burner, according to DIN 4102 B2 as well as EN 11925-2



Technical data:

| | BKK2 |
|---------------------------------|-----------------|
| Dimensions | |
| Dimensions outside, WxDxH [mm] | 700 x 400 x 910 |
| Dimensions inside, WxDxH [mm] | 696 x 396 x 670 |
| Weight [kg], approx. | 40 |
| Connection for exhaust air [mm] | Ø 150 |
| Connection for gas [mm] | Ø 6 (hose) |

◆ GLOW WIRE TEST INSTRUMENT

Glow Wire Test Instrument according to DIN EN 60695-2-11 /-12 /-13

Tests for evaluating the risk of flammability and ignitability

Standards-compliant testing instrument of the latest generation for largely automated glow-wire tests to assess the fire hazard according to DIN EN 60695-2-11 /-12 /-13.

Non-contact IR detection of the glow wire temperature.

Features / Equipment:

- Compact and robust table-top unit
- Automatic test sequence after pressing the start button
- Sled movement via motorized linear drive with defined speed
- Contact force by means of standard weights and cable pulls
- Temperature controller with continuous voltage output and fuzzy self-optimisation
- MANUAL & AUTOMATIC operating modes selectable via switch
- Glow-wire loop
- Compact two-wire infrared thermometer with high temperature resolution
- LED display fields for set and actual temperature, time and heating current
- Adjustable fixture for test specimens with maximum dimensions [120 x 120 x 20] mm
- Measuring scale for flame height
- Measuring scale for penetration depth
- Manual stopwatch (for checking the internal electronic timer)

Optional:

- Test chamber made of sheet steel for standard-compliant glow-wire testing
- Exhaust air connection
- Manual control
- DAkkS calibration of the pyrometer



Technical data:

| | GDP |
|--|------------------|
| Technical Data | |
| Mains voltage / mains frequency [VAC; Hz] | 230; 50 / 60 |
| Nominal power [kW] | 0.5 |
| Mains connection | IEC mains socket |
| Electric plug (at end of detachable power supply cord) | »SCHUKO« Type |
| Dimensions | |
| Width [mm] | 505 |
| Height [mm] | 650 |
| Depth [mm] | 332 |
| Weight [kg] | 30 |

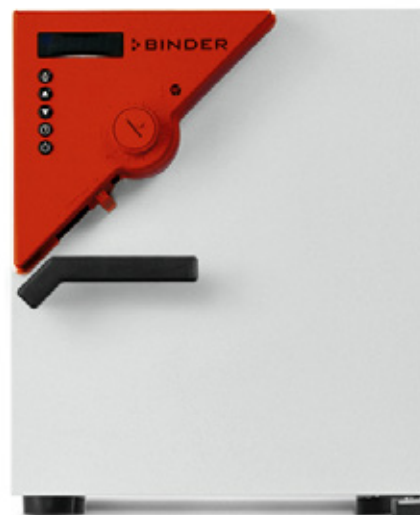
◆ DRYING AND HEATING CHAMBERS

Series ED: Drying and heating chambers Classic.Line with natural convection

The strengths of a ED series drying chamber include routine drying and sterilization tasks up to 300 °C. Thanks to the natural convection, all thermal processes which use this drying chamber are highly efficient. The ED series ensures fast, uniform drying.

Features:

- Temperature range: room temperature +5 °C to 300 °C
- Natural convection
- Adjustable exhaust air flap
- Controller with timer functions
- Class 2 independent adjustable temperature safety device (DIN 12880) with visual alarm
- RS 422 interface (only with ED400)



ED 023



ED 400

Technical data:

| | ED023 | ED400 |
|--|-----------|-----------|
| Article Number | 9010-0190 | 9010-0075 |
| Performance Data Temperature | | |
| Temperature range 5 °C above ambient temperature to [°C] | 300 | 300 |
| Temperature variation at 150 °C [± K] | 2,8 | 3 |
| Temperature fluctuation at 150 °C [± K] | 0,5 | 0,5 |
| Heating-up time to 150 °C [min] | 28 | 71 |
| Recovery time after 30 seconds door open at 150 °C [min] | 5 | 31 |
| Electrical data | | |
| Rated Voltage [V] | 230 | 400 |
| Power frequency [Hz] | 50 / 60 | 50 / 60 |
| Nominal power [kW] | 0,8 | 3,4 |
| Unit fuse [A] | 10 | 3 x 16 |
| Phase (Nominal voltage) [ph] | 1 ~ | 3 ~ |
| Outer dimensions | | |
| Width net [mm] | 435 | 1235 |
| Height net [mm] | 495 | 1025 |
| Depth net [mm] | 520 | 765 |
| Wall clearance back [mm] | 100 | 160 |
| Wall clearance sidewise [mm] | 100 | 100 |
| Doors | | |
| Unit doors | 1 | 2 |
| Internal Dimensions | | |
| Width [mm] | 222 | 1000 |
| Height [mm] | 330 | 800 |
| Depth [mm] | 300 | 520 |
| Further Dimension | | |
| Interior volume [L] | 20 | 400 |
| Net weight of the unit (empty) [kg] | 27 | 125 |
| Permitted load [kg] | 25 | 90 |
| Load per rack [kg] | 12 | 35 |
| Environment-specific data | | |
| Energy consumption at 150 °C [Wh/h] | 148 | 672 |
| Fixtures | | |
| Number of shelves (std./max.) | 2 / 4 | 2 / 10 |

* 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.

Series ED: Drying and heating chambers Avantgarde.Line with natural convection

The strengths of a ED series drying chamber include routine drying and sterilization tasks up to 300 °C. Thanks to the natural convection, all thermal processes which use this drying chamber are highly efficient. The ED series ensures fast, uniform drying.

Features:

- Temperature range: ambient temperature +5 °C to 300 °C
- High temperature accuracy thanks to APT.line™ technology
- Natural convection
- Controller with LCD display
- Electromechanical control of the exhaust air flap
- 2 chrome-plated racks
- Units up to 115 L are stackable
- Class 2 independent temperature safety device (DIN 12880) with visual temperature alarm
- Ergonomic handle design
- USB port for recording data



ED 056



ED 56

Technical data:

| | ED056 | ED115 | ED260 | ED720 |
|--|-----------|-----------|-----------|-----------|
| | 230V * | 230V * | 230V * | 400V * |
| Article Number | 9010-0333 | 9010-0335 | 9010-0339 | 9010-0341 |
| Performance Data Temperature | | | | |
| Temperature range 5 °C above ambient temperature to [°C] | 300 | 300 | 300 | 300 |
| Temperature variation at 150 °C [± K] | 2,3 | 1,5 | 1,8 | 3,2 |
| Temperature fluctuation at 150 °C [± K] | 0,4 | 0,4 | 0,8 | 0,8 |
| Heating-up time to 150 °C [min] | 50 | 45 | 50 | 85 |
| Recovery time after 30 seconds door open at 150 °C [min] | 19 | 16 | 20 | 25 |
| Electrical data | | | | |
| Rated Voltage [V] | 230 | 230 | 230 | 400 |
| Power frequency [Hz] | 50 / 60 | 50 / 60 | 50 / 60 | 50 / 60 |
| Nominal power [kW] | 1,05 | 1,25 | 2,25 | 4,1 |
| Unit fuse [A] | 6,3 | 6,3 | 12,5 | 16 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ | 1~ | 1~ |
| Outer dimensions | | | | |
| Width net [mm] | 560 | 710 | 810 | 1165 |
| Height net [mm] | 625 | 705 | 940 | 1590 |
| Depth net [mm] | 565 | 605 | 760 | 870 |
| Wall clearance back [mm] | 160 | 160 | 160 | 160 |
| Wall clearance sidewise [mm] | 100 | 100 | 100 | 100 |
| Doors | | | | |
| Unit doors | 1 | 1 | 1 | 2 |
| Internal Dimensions | | | | |
| Width [mm] | 360 | 510 | 610 | 960 |
| Height [mm] | 420 | 530 | 760 | 1280 |
| Depth [mm] | 380 | 425 | 550 | 605 |
| Further Dimension | | | | |
| Interior volume [L] | 57 | 114 | 255 | 743 |
| Net weight of the unit (empty) [kg] | 42 | 57 | 84 | 161 |
| Permitted load [kg] | 70 | 150 | 270 | 315 |
| Load per rack [kg] | 30 | 30 | 40 | 45 |
| Environment-specific data | | | | |
| Energy consumption at 150 °C [Wh/h] | 180 | 245 | 355 | 700 |
| Fixtures | | | | |
| Number of shelves (std./max.) | 2 / 4 | 2 / 5 | 2 / 8 | 2 / 16 |

* 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.

Series ED-S: Drying and heating chambers Solid.Line with natural convection

The new products in the Solid.Line impress with their tried-and-tested BINDER quality and reliability. They are suited to drying and heating. The attributes of the Solid.Line are geared towards the application in question and therefore used in research and quality assurance.

Features:

- Temperature range: ambient temperature plus 7 °C to 250 °C
- APT.line™ preheating chamber technology
- Natural convection
- Adjustable exhaust air flap
- Controller with timer function
- 1 chrome-plated racks, incl. shelf supports
- Class 2 independent temperature safety device (DIN 12880) with visual temperature alarm



ED-S 056



ED-S 115

Technical data:

| | ED-S056 | ED-S115 |
|--|-----------|-----------|
| | 230V * | 230V * |
| Article Number | 9090-0014 | 9090-0020 |
| Performance Data Temperature | | |
| Temperature range 7 °C above ambient temperature to [°C] | 250 | 250 |
| Temperature variation at 150 °C [± K] | 2,8 | 2,8 |
| Temperature fluctuation at 150 °C [± K] | 0,8 | 0,8 |
| Heating-up time to 150 °C [min] | 60 | 55 |
| Electrical data | | |
| Rated Voltage [V] | 230 | 230 |
| Power frequency [Hz] | 50 / 60 | 50 / 60 |
| Nominal power [kW] | 1,05 | 1,25 |
| Unit fuse [A] | 6,3 | 6,3 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ |
| Outer dimensions | | |
| Width net [mm] | 614 | 764 |
| Height net [mm] | 625 | 735 |
| Depth net [mm] | 577 | 616 |
| Wall clearance back [mm] | 160 | 160 |
| Wall clearance sidewise [mm] | 100 | 100 |
| Doors | | |
| Unit doors | 1 | 1 |
| Internal Dimensions | | |
| Width [mm] | 400 | 550 |
| Height [mm] | 440 | 550 |
| Depth [mm] | 350 | 390 |
| Further Dimension | | |
| Interior volume [L] | 62 | 118 |
| Net weight of the unit (empty) [kg] | 36 | 53 |
| Permitted load [kg] | 30 | 75 |
| Load per rack [kg] | 15 | 20 |
| Environment-specific data | | |
| Energy consumption at 150 °C [Wh/h] | 180 | 310 |
| Fixtures | | |
| Number of shelves (std./max.) | 1 / 3 | 1 / 5 |

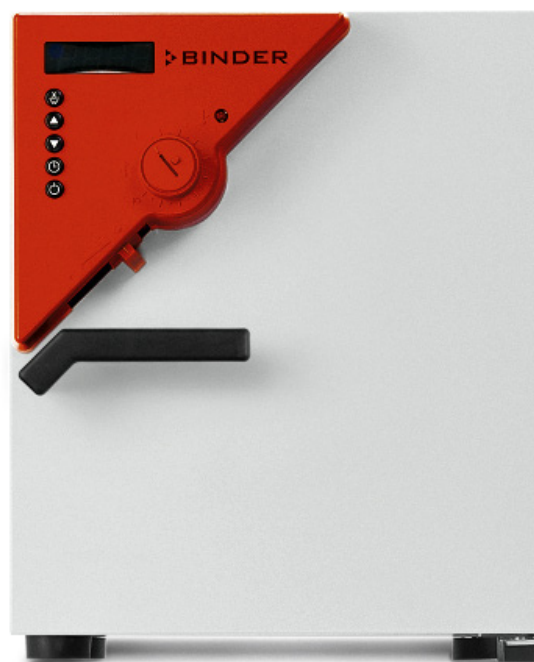
* All technical data is specified for unloaded units with standard equipment at an ambient temperature of +22 °C ±3 °C and a power supply voltage fluctuation of ±10%. The temperature data is determined in accordance to BINDER factory standard following DIN 12880, observing the recommended wall clearances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

Series FD: Drying and heating chambers Classic.Line with forced convection

A FD series heating oven is always used when fast drying and sterilization is required. Thanks to its fully homogeneous temperature distribution, quick dynamics and powerful fan, this heating oven saves valuable time.

Features:

- Temperature range: room temperature plus 5 °C to 300 °C
- APT.line™ preheating chamber technology
- Forced convection
- Adjustable exhaust air flap
- Controller with timer functions
- 2 chrome-plated racks
- Class 2 independent adjustable temperature safety device (DIN 12880) with visual alarm



FD 023

Technical data:

| | FD023 |
|--|--------------|
| | 230V * |
| Article Number | 9010-0194 |
| Performance Data Temperature | |
| Temperature range 5 °C above ambient temperature to [°C] | 300 |
| Temperature variation at 150 °C [± K] | 2,5 |
| Temperature fluctuation at 150 °C [± K] | 0,3 |
| Heating-up time to 150 °C [min] | 25 |
| Recovery time after 30 seconds door open at 150 °C [min] | 6 |
| Air change data | |
| Air change (approx.) at 150 °C [x/h] | 64 |
| Electrical data | |
| Rated Voltage [V] | 230 |
| Power frequency [Hz] | 50 / 60 |
| Nominal power [kW] | 0,8 |
| Unit fuse [A] | 10 |
| Phase (Nominal voltage) [ph] | 1~ |
| Outer dimensions | |
| Width net [mm] | 435 |
| Height net [mm] | 495 |
| Depth net [mm] | 520 |
| Wall clearance back [mm] | 160 |
| Wall clearance sidewise [mm] | 100 |
| Doors | |
| Unit doors | 1 |
| Internal Dimensions | |
| Width [mm] | 222 |
| Height [mm] | 330 |
| Depth [mm] | 300 |
| Further Dimension | |
| Interior volume [L] | 20 |
| Net weight of the unit (empty) [kg] | 27 |
| Permitted load [kg] | 25 |
| Load per rack [kg] | 12 |
| Environment-specific data | |
| Energy consumption at 150 °C [Wh/h] | 300 |
| Fixtures | |
| Number of shelves (std./max.) | 2 / 4 |

* 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. 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.

Series FD: Drying and heating chambers Avantgarde.Line with forced convection

A FD series Avantgarde.Line heating oven is always used when fast drying and sterilization is required. Thanks to its fully homogeneous temperature distribution, quick dynamics and powerful fan, this heating oven saves valuable time.

Features:

- Temperature range: ambient temperature +10 °C to 300 °C (FD 720: +12 °C to 300 °C)
- High temperature accuracy thanks to APT.line™ technology
- Forced convection
- Controller with LCD display
- Electromechanical control of the exhaust air flap
- 2 chrome-plated racks
- Units up to 115 L are stackable
- Class 2 independent temperature safety device (DIN 12880) with visual temperature alarm
- Ergonomic handle design
- USB port for recording data



FD 056



FD 056

Technical data:

| | FD056 | FD115 | FD260 | FD720 |
|---|-----------|-----------|-----------|-----------|
| | 230V * | 230V * | 230V * | 400V * |
| Article Number | 9010-0303 | 9010-0305 | 9010-0309 | 9010-0311 |
| Performance Data Temperature | | | | |
| Temperature range 10 °C (12 °C) above ambient temperature to [°C] | 300 | 300 | 300 | 300 |
| Temperature variation at 150 °C [± K] | 1,7 | 1,7 | 1,9 | 2,5 |
| Temperature fluctuation at 150 °C [± K] | 0,3 | 0,3 | 0,4 | 0,6 |
| Heating-up time to 150 °C [min] | 15 | 18 | 19 | 25 |
| Recovery time after 30 seconds door open at 150 °C [min] | 4 | 4 | 5 | 6 |
| Electrical data | | | | |
| Rated Voltage [V] | 230 | 230 | 230 | 400 |
| Power frequency [Hz] | 50 / 60 | 50 / 60 | 50 / 60 | 50 / 60 |
| Nominal power [kW] | 1,1 | 1,3 | 2,3 | 4,5 |
| Unit fuse [A] | 6,3 | 6,3 | 12,5 | 3x16 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ | 1~ | 3~ |
| Outer dimensions | | | | |
| Width net [mm] | 560 | 710 | 810 | 1165 |
| Height net [mm] | 625 | 735 | 940 | 1590 |
| Depth net [mm] | 565 | 605 | 825 | 870 |
| Wall clearance back [mm] | 160 | 160 | 160 | 160 |
| Wall clearance sidewise [mm] | 100 | 100 | 100 | 100 |
| Doors | | | | |
| Unit doors | 1 | 1 | 1 | 2 |
| Internal Dimensions | | | | |
| Width [mm] | 400 | 550 | 650 | 1000 |
| Height [mm] | 440 | 550 | 780 | 1300 |
| Depth [mm] | 345 | 385 | 515 | 570 |
| Further Dimension | | | | |
| Interior volume [L] | 60 | 116 | 259 | 741 |
| Net weight of the unit (empty) [kg] | 39 | 54 | 85 | 166 |
| Permitted load [kg] | 70 | 150 | 270 | 315 |
| Load per rack [kg] | 30 | 30 | 40 | 45 |
| Environment-specific data | | | | |
| Energy consumption at 150 °C [Wh/h] | 290 | 340 | 410 | 800 |
| Sound-pressure level [dB(A)] | 43 | 43 | 43 | 43 |
| Fixtures | | | | |
| Number of shelves (std./max.) | 2 / 4 | 2 / 5 | 2 / 8 | 2 / 16 |

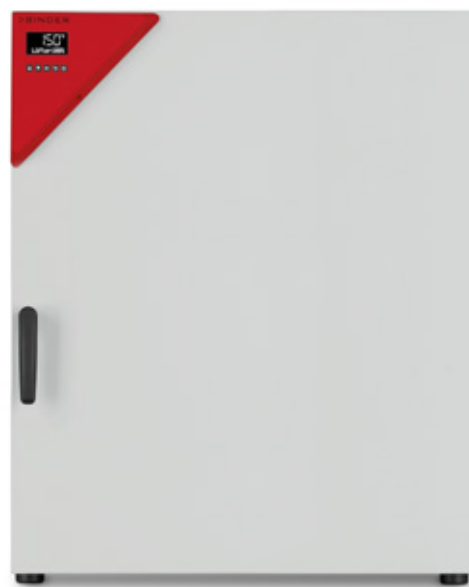
* All technical data is specified for unloaded units with standard equipment at an ambient temperature of +22 °C ±3 °C and a power supply voltage fluctuation of ±10 %. The temperature data is determined in accordance to BINDER factory standard following DIN 12880, observing the recommended wall clearances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

Series FED: Drying and heating chambers Avantgarde.Line with forced convection and enhanced timer functions

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.

Features:

- Temperature range +10 °C upto 300 °C (FED 720: +12 °C to 300 °C)
- High temperature accuracy thanks to APT.line™ technology
- Adjustable fan speed
- Controller with LCD display
- Electromechanical control of the exhaust air flap
- 2 chrome-plated racks
- Units up to 115 L are stackable
- Class 2 independent temperature safety device (DIN 12880) with visual temperature alarm
- Ergonomic handle design
- Ethernet interface
- USB port for recording data



FED 260



FED 720

Technical data:

| | FED056 | FED115 | FED260 | FED720 |
|--|-----------|-----------|-----------|-----------|
| | 230V * | 230V * | 230V * | 400V * |
| Article Number | 9010-0295 | 9010-0293 | 9010-0299 | 9010-0301 |
| Performance Data Temperature | | | | |
| Temperature range 10°C above ambient temperature to [°C] | 300 | 300 | 300 | - |
| Temperature range 12°C above ambient temperature to [°C] | - | - | - | 300 |
| Temperature variation at 150 °C [± K] | 1,4 | 1,2 | 1,6 | 2,0 |
| Temperature fluctuation at 150 °C [± K] | 0,3 | 0,3 | 0,4 | 0,6 |
| Heating-up time to 150 °C [min] | 15 | 18 | 19 | 25 |
| Recovery time after 30 seconds door open at 150 °C [min] | 4 | 4 | 5 | 6 |
| Electrical data | | | | |
| Rated Voltage [V] | 230 | 230 | 230 | 400 |
| Power frequency [Hz] | 50 / 60 | 50 / 60 | 50 / 60 | 50 / 60 |
| Nominal power [kW] | 1,1 | 1,3 | 2,3 | 4,5 |
| Unit fuse [A] | 6,3 | 6,3 | 12,5 | 3x16 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ | 1~ | 3~ |
| Outer dimensions | | | | |
| Width net [mm] | 560 | 710 | 810 | 1165 |
| Height net [mm] | 625 | 735 | 965 | 1590 |
| Depth net [mm] | 565 | 605 | 760 | 870 |
| Wall clearance back [mm] | 160 | 160 | 160 | 160 |
| Wall clearance sidewise [mm] | 100 | 100 | 100 | 100 |
| Doors | | | | |
| Unit doors | 1 | 1 | 1 | 2 |
| Internal Dimensions | | | | |
| Width [mm] | 400 | 550 | 650 | 1000 |
| Height [mm] | 440 | 550 | 780 | 1300 |
| Depth [mm] | 345 | 385 | 515 | 570 |
| Further Dimension | | | | |
| Interior volume [L] | 60 | 116 | 259 | 741 |
| Net weight of the unit (empty) [kg] | 41 | 57 | 84 | 162 |
| Permitted load [kg] | 70 | 150 | 270 | 315 |
| Load per rack [kg] | 30 | 30 | 40 | 45 |
| Environment-specific data | | | | |
| Energy consumption at 150 °C [Wh/h] | 290 | 340 | 410 | 800 |
| Sound-pressure level [dB(A)] | 43 | 43 | 43 | 43 |
| Fixtures | | | | |
| Number of shelves (std./max.) | 2 / 4 | 2 / 5 | 2 / 8 | 2 / 16 |

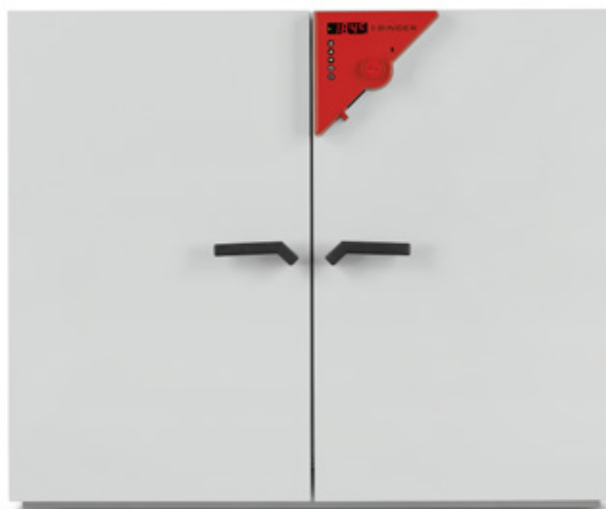
* All technical data is specified for unloaded units with standard equipment at an ambient temperature of +22 °C ±3 °C and a power supply voltage fluctuation of ±10 %. The temperature data is determined in accordance to BINDER factory standard following DIN 12880, observing the recommended wall clearances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

Series FED: Drying and heating chambers Classic.Line with forced convection and enhanced timer functions

Heating chambers of the FED series provide almost unlimited capacity and are particularly adaptable. With advanced timing functions and 2 adjustable fans, temperature and convection conditions are easily controlled.

Features:

- Temperature range: room temperature +5 °C to 300 °C
- APT.line™ preheating chamber technology
- Adjustable fan speed
- Adjustable exhaust air flap
- Controller with expanded timer functions
- 2 chrome-plated racks
- Class 2 independent adjustable temperature safety device (DIN 12880) with visual alarm
- Computer interface: RS 422



FED 400

Technical data:

| | FED400 |
|--|-----------|
| | 400V * |
| Article Number | 9010-0216 |
| Performance Data Temperature | |
| Temperature range 5 °C above ambient temperature to [°C] | 300 |
| Temperature variation at 150 °C [± K] | 3,8 |
| Temperature fluctuation at 150 °C [± K] | 0,7 |
| Heating-up time to 150 °C [min] | 29 |
| Recovery time after 30 seconds door open at 150 °C [min] | 6 |
| Air change data | |
| Air change (approx.) at 150 °C [x/h] | 18 |
| Electrical data | |
| Rated Voltage [V] | 400 |
| Power frequency [Hz] | 50 / 60 |
| Nominal power [kW] | 3,4 |
| Unit fuse [A] | 3x16 |
| Phase (Nominal voltage) [ph] | 3~ |
| Outer dimensions | |
| Width net [mm] | 1235 |
| Height net [mm] | 1025 |
| Depth net [mm] | 765 |
| Wall clearance back [mm] | 160 |
| Wall clearance sidewise [mm] | 100 |
| Doors | |
| Unit doors | 2 |
| Internal Dimensions | |
| Width [mm] | 1000 |
| Height [mm] | 800 |
| Depth [mm] | 510 |
| Further Dimension | |
| Interior volume [L] | 400 |
| Net weight of the unit (empty) [kg] | 145 |
| Permitted load [kg] | 90 |
| Load per rack [kg] | 35 |
| Environment-specific data | |
| Energy consumption at 150 °C [Wh/h] | 1200 |
| Fixtures | |
| Number of shelves (std./max.) | 2 / 10 |

* 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. 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.

Series FP: Drying and heating chambers Classic.Line with forced convection and program functions

A material test chamber with mechanical convection of the FP series provides reliably short drying times and particularly fast heating – even for chambers under full loads.

Features:

- Temperature range: room temperature +5 °C to 300 °C
- APT.line™ preheating chamber technology
- Adjustable fan speed
- Adjustable exhaust air flap
- Controller with time-segment and real-time programming
- 2 chrome-plated racks
- Class 2 independent adjustable temperature safety device (DIN 12880) with visual alarm
- Computer interface: RS 422



FP 053



FP 720

Technical data:

| | FP053 | FP115 | FP240 | FP720 |
|--|-----------|-----------|-----------|-----------|
| | 230V * | 230V * | 230V * | 400V * |
| Article Number | 9010-0153 | 9010-0255 | 9010-0263 | 9010-0267 |
| Performance Data Temperature | | | | |
| Temperature range 5 °C above ambient temperature to [°C] | 300 | 300 | 300 | 300 |
| Temperature variation at 150 °C [± K] | 2 | 1,8 | 2 | 2 |
| Temperature fluctuation at 150 °C [± K] | 0,3 | 0,3 | 0,3 | 0,3 |
| Heating-up time to 150 °C [min] | 24 | 30 | 27 | 39 |
| Recovery time after 30 seconds door open at 150 °C [min] | 5 | 8 | 10 | 20 |
| Air change data | | | | |
| Air change (approx.) at 150 °C [x/h] | 64 | 32 | 20 | 12 |
| Electrical data | | | | |
| Rated Voltage [V] | 230 | 230 | 230 | 400 |
| Power frequency [Hz] | 50 / 60 | 50 / 60 | 50 / 60 | 50 / 60 |
| Nominal power [kW] | 1,2 | 1,6 | 2,7 | 5 |
| Unit fuse [A] | 10 | 10 | 16 | 3 x 16 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ | 1~ | 3~ |
| Outer dimensions | | | | |
| Width net [mm] | 635 | 835 | 1035 | 1235 |
| Height net [mm] | 620 | 705 | 825 | 1530 |
| Depth net [mm] | 575 | 645 | 745 | 865 |
| Wall clearance back [mm] | 160 | 160 | 160 | 160 |
| Wall clearance sidewise [mm] | 100 | 100 | 100 | 100 |
| Internal Dimensions | | | | |
| Width [mm] | 400 | 600 | 800 | 1000 |
| Height [mm] | 400 | 480 | 600 | 1200 |
| Depth [mm] | 340 | 410 | 510 | 610 |
| Further Dimension | | | | |
| Interior volume [L] | 53 | 115 | 240 | 720 |
| Net weight of the unit (empty) [kg] | 44 | 62 | 96 | 194 |
| Permitted load [kg] | 40 | 50 | 70 | 120 |
| Load per rack [kg] | 15 | 20 | 30 | 45 |
| Environment-specific data | | | | |
| Energy consumption at 150 °C [Wh/h] | 300 | 544 | 850 | 1320 |
| Fixtures | | | | |
| Number of shelves (std./max.) | 2 / 5 | 2 / 6 | 2 / 7 | 2 / 16 |

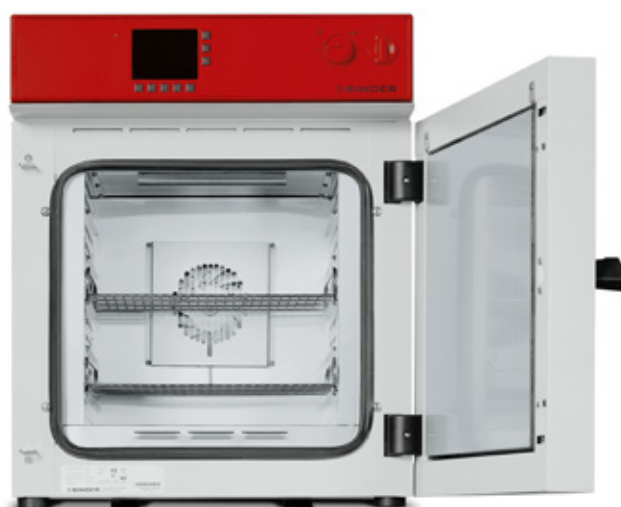
* All technical data is specified for unloaded units with standard equipment at an ambient temperature of +22 °C ±3 °C and a power supply voltage fluctuation of ±10 %. The temperature data is determined in accordance to BINDER factory standard following DIN 12880, observing the recommended wall clearances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

Series M: Drying and heating chambers Classic.Line with forced convection and advanced program functions

With a maximum of 300 °C and various programming options the M series material test chambers are ideal for material and aging tests. With a high air flow, the powerful fans ensure rapid heating.

Features:

- Temperature range: room temperature +5 °C to 300 °C
- APT.line™ preheating chamber technology
- Adjustable fan speed
- Program-controlled ventilation flap
- Color LCD controller with time-segment programming
- 2 chrome-plated racks
- Class 2 independent adjustable temperature safety device (DIN 12880) with visual alarm
- Computer interface: RS 422



M 053

M 720

Technical data:

| | M053 | M115 | M240 | M400 | M720 |
|--|-----------|-----------|-----------|-----------|-----------|
| | 230V * | 230V * | 230V * | 400V * | 400V * |
| Article Number | 9010-0201 | 9010-0202 | 9010-0203 | 9010-0204 | 9010-0205 |
| Performance Data Temperature | | | | | |
| Temperature range 5 °C above ambient temperature to [°C] | 300 | 300 | 300 | 300 | 300 |
| Temperature variation at 150 °C [± K] | 1,3 | 1,5 | 1,5 | 1,5 | 1,9 |
| Temperature fluctuation at 150 °C [± K] | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 |
| Heating-up time to 150 °C [min] | 15 | 16 | 19 | 18 | 21 |
| Recovery time after 30 seconds door open at 150 °C [min] | 3 | 3 | 3 | 3 | 3 |
| Air change data | | | | | |
| Air change (approx.) at 150 °C [x/h] | 192 | 96 | 60 | 54 | 36 |
| Electrical data | | | | | |
| Rated Voltage [V] | 230 | 230 | 230 | 400 | 400 |
| Power frequency [Hz] | 50 / 60 | 50 / 60 | 50 / 60 | 50 / 60 | 50 / 60 |
| Nominal power [kW] | 1,2 | 1,6 | 2,7 | 3,4 | 5 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ | 1~ | 3~ | 3~ |
| Outer dimensions | | | | | |
| Width net [mm] | 635 | 835 | 1035 | 1235 | 1235 |
| Height net [mm] | 780 | 865 | 985 | 1190 | 1690 |
| Depth net [mm] | 575 | 645 | 745 | 795 | 865 |
| Wall clearance back [mm] | 160 | 160 | 160 | 160 | 160 |
| Wall clearance sidewise [mm] | 100 | 100 | 100 | 100 | 100 |
| Internal Dimensions | | | | | |
| Width [mm] | 400 | 600 | 800 | 1000 | 1000 |
| Height [mm] | 400 | 480 | 600 | 800 | 1200 |
| Depth [mm] | 340 | 410 | 510 | 510 | 610 |
| Further Dimension | | | | | |
| Interior volume [L] | 53 | 115 | 240 | 400 | 720 |
| Net weight of the unit (empty) [kg] | 61 | 89 | 131 | 173 | 203 |
| permitted load [kg] | 40 | 50 | 70 | 90 | 120 |
| Load per rack [kg] | 15 | 20 | 30 | 35 | 45 |
| Environment-specific data | | | | | |
| Energy consumption at 150 °C [Wh/h] | 300 | 544 | 850 | 1200 | 1320 |
| Fixtures | | | | | |
| Number of shelves (std./max.) | 2 / 5 | 2 / 6 | 2 / 7 | 2 / 10 | 2 / 16 |

* 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. 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.

SAFETY DRYING OVENS

Series FDL: Safety drying chambers for limited quantities of solvent

The FDL 115 with silicone and dust-free inner chamber, as well as symmetric airflow dries specimens containing solvents and thus this safety drying oven meets all EN 1539 requirements.

Features:

- Temperature range: room temperature +10 °C to 300 °C
- APT.line™ preheating chamber technology
- Controller with time-segment and real-time programming
- 2 chrome-plated racks
- Fresh-air monitoring with audible and visual alarm and automatic deactivation of heating
- Replaceable filter cartridge, Class M6
- Class 2 independent adjustable temperature safety device (DIN 12880) with visual alarm
- Computer interface: RS 422

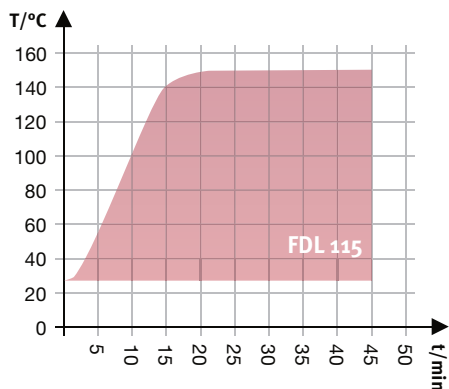


FDL 115



FDL 115

Heating up time:



Technical data:

| | FDL115 |
|--|---------------|
| | 230V * |
| Article Number | 9010-0292 |
| Performance Data Temperature | |
| Temperature range 10 °C above ambient temperature to [°C] | 300 |
| Temperature variation at 150 °C [± K] | 2,5 |
| Temperature fluctuation [± K] | 0,8 |
| Heating-up time to 150 °C [min] | 20 |
| Recovery time after 30 seconds door open at 150 °C [min] | 12 |
| Air change data | |
| Air circulation (approx.) [x/min] | 20 |
| Volumetric flow rate of exhaust air acc. to EN 1539 at 50 °C [ca. L/min] | 400 |
| solvent quantity | |
| Highest permitted solvent quantity (at T-180 °C, M-100g/mol, U-40g/m ³ , K=0,5) [g] | 66,5 |
| Electrical data | |
| Rated Voltage [V] | 230 |
| Power frequency [Hz] | 50 / 60 |
| Nominal power [kW] | 2,9 |
| Phase (Nominal voltage) [ph] | 1~ |
| Outer dimensions | |
| Width net [mm] | 830 |
| Height net [mm] | 805 |
| Depth net [mm] | 685 |
| Wall clearance back [mm] | 160 |
| Wall clearance sidewise [mm] | 100 |
| Internal Dimensions | |
| Width [mm] | 600 |
| Height [mm] | 435 |
| Depth [mm] | 435 |
| Further Dimension | |
| Interior volume [L] | 115 |
| Net weight of the unit (empty) [kg] | 90 |
| permitted load [kg] | 60 |
| Load per rack [kg] | 30 |
| Environment-specific data | |
| Energy consumption at 150 °C [Wh/h] | 1200 |
| Sound-pressure level [dB(A)] | 57 |
| Fixtures | |
| Number of shelves (std./max.) | 2 / 5 |

* 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. 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.

COOLING CHAMBERS

Series KT: Cooling chambers with peltier technology

The KT series combines outstanding performance with impressive energy efficiency and environmental friendliness. The cooled incubators of the KT series are state-of-the-art in application and protect the samples.

Features:

- Temperature range +4 °C to 100 °C
- APT.line™ preheating chamber technology
- Adjustable fan speed
- Electrical cooling with peltier module
- Controller with time-segment and real-time programming
- Display via LCD monitor
- Input via pushbutton / rotary knob
- Inner door made of tempered safety glass
- 2 stainless steel racks
- Units up to 115 liters are stackable
- Access port with silicone plug from 240 liters
- Class 3.1 independent temperature safety device (DIN 12880) with visual and audible temperature alarm
- Computer interface: Ethernet
- Data recording and USB interface



KT 053



KT 170

Technical data:

| | KT053 | KT115 | KT170 |
|---|-----------|-----------|-----------|
| | 230V * | 230V * | 230V * |
| Article Number | 9020-0311 | 9020-0313 | 9020-0289 |
| Performance Data Temperature | | | |
| Temperature range [°C] | +4...100 | +4...100 | +4...100 |
| Temperature variation at 37 °C [± K] | 0,3 | 0,3 | 0,4 |
| Temperature fluctuation at 37 °C [± K] | 0,1 | 0,1 | 0,1 |
| Recovery time after 30 seconds door open at 37 °C [min] | 2 | 3 | 3 |
| Electrical data | | | |
| Rated Voltage [V] | 200...240 | 200...240 | 200...240 |
| Power frequency [Hz] | 50/60 | 50/60 | 50/60 |
| Nominal power [kW] | 0,4 | 0,7 | 0,8 |
| Unit fuse [A] | 10 | 10 | 10 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ | 1~ |
| Outer dimensions | | | |
| Width net [mm] | 660 | 860 | 860 |
| Height net [mm] | 635 | 715 | 1025 |
| Depth net [mm] | 630 | 655 | 655 |
| Wall clearance back [mm] | 100 | 100 | 100 |
| Wall clearance sidewise [mm] | 240 | 240 | 240 |
| Doors | | | |
| Inner doors | 1 | 1 | 1 |
| Unit doors | 1 | 1 | 1 |
| Internal Dimensions | | | |
| Width [mm] | 400 | 600 | 600 |
| Height [mm] | 400 | 455 | 765 |
| Depth [mm] | 334 | 355 | 355 |
| Further Dimension | | | |
| Interior volume [L] | 53 | 102 | 163 |
| Net weight of the unit (empty) [kg] | 63 | 83 | 102 |
| permitted load [kg] | 40 | 100 | 120 |
| Load per rack [kg] | 15 | 30 | 30 |
| Environment-specific data | | | |
| Energy consumption at 25 °C [Wh/h] | 75 | 75 | 80 |
| Energy consumption at 37 °C [Wh/h] | 75 | 75 | 80 |
| Sound-pressure level [dB(A)] | 48 | 48 | 48 |
| Fixtures | | | |
| Number of shelves (std./max.) | 2 / 5 | 2 / 6 | 2 / 10 |

* 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. 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.

Series KB: Cooling chambers with compressor technology

The most versatile among the cooled incubators: The KB series cooled incubator controls temperature ranges of 0/-10 °C to 100 °C.

With its comprehensive program functions, this cooled incubator offers a wide range of capabilities and delivers reproducible test results.

Features:

- Temperature range 0/-10 °C to 100 °C
- APT.line™ preheating chamber technology
- Cooling with compressor cooling unit
- Adjustable fan speed
- Controller with time-segment and real-time programming
- Operating hours counter
- Inner door made of tempered safety glass
- 2 stainless steel racks
- Units up to 115 liters are stackable
- Class 3.1 independent temperature safety device (DIN 12880) with visual and audible temperature alarm



KB 240



KB 240

Technical data:

| | KB053 | KB115 | KB240 | KB400 | KB720 |
|---|-----------|-----------|-----------|-----------|-----------|
| | 230V * | 230V * | 230V * | 230V * | 230V * |
| Article Number | 9020-0199 | 9020-0397 | 9020-0202 | 9020-0203 | 9020-204 |
| Performance Data Temperature | | | | | |
| Temperature range [°C] | -10...100 | -10...100 | -10...100 | -10...100 | -10...100 |
| Temperature variation at 37 °C [± K] | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 |
| Temperature fluctuation at 37 °C [± K] | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Recovery time after 30 seconds door open at 37 °C [min] | 2 | 2 | 2 | 4 | 3 |
| Electrical data | | | | | |
| Rated Voltage [V] | 230 | 230 | 200...240 | 200...240 | 200...240 |
| Power frequency [Hz] | 50 | 50 | 50 / 60 | 50 / 60 | 50 / 60 |
| Nominal power [kW] | 0,6 | 0,7 | 1,2 | 1,4 | 2,3 |
| Unit fuse [A] | 10 | 10 | 16 | 16 | 16 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ | 1~ | 1~ | 1~ |
| Outer dimensions | | | | | |
| Width net [mm] | 635 | 835 | 925 | 925 | 1250 |
| Height net [mm] | 835 | 1025 | 1465 | 1950 | 1925 |
| Depth net [mm] | 580 | 650 | 800 | 805 | 885 |
| Wall clearance back [mm] | 100 | 100 | 100 | 100 | 100 |
| Wall clearance sidewise [mm] | 100 | 100 | 100 | 100 | 100 |
| Doors | | | | | |
| Inner doors | 1 | 1 | 1 | 1 | 2 |
| Unit doors | 1 | 1 | 1 | 1 | 2 |
| Internal Dimensions | | | | | |
| Width [mm] | 400 | 600 | 650 | 650 | 970 |
| Height [mm] | 400 | 480 | 785 | 1270 | 1250 |
| Depth [mm] | 330 | 400 | 485 | 485 | 576 |
| Further Dimension | | | | | |
| Interior volume [L] | 53 | 115 | 247 | 400 | 698 |
| Net weight of the unit (empty) [kg] | 78 | 106 | 171 | 221 | 304 |
| permitted load [kg] | 40 | 50 | 100 | 120 | 150 |
| Load per rack [kg] | 15 | 20 | 30 | 30 | 45 |
| Environment-specific data | | | | | |
| Energy consumption at 37 °C [Wh/h] | 70 | 75 | 270 | 330 | 360 |
| Energy consumption at 40 °C [Wh/h] | | | | | |
| Sound-pressure level [dB(A)] | 49 | 49 | 53 | 53 | 53 |
| Fixtures | | | | | |
| Number of shelves (std./max.) | 2 / 4 | 2 / 5 | 2 / 9 | 2 / 15 | 2 / 15 |

* 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. 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.

Series KB ECO: Constant cooling chambers with peltier temperature control system

The new series of cooling chambers guarantees homogeneous constant temperature conditions, low noise and excellent energy efficiency through the combination of advanced technologies: Peltier cooling & heating system with patented heat dissipation, digitally controlled „APT.line“ preheating chamber technology and forced air circulation through controllable fan.

Features:

- Temperature range 0°C to 70 °C
- APT.line™ preheating chamber technology
- Microprocessor controller with LCD display and integrated real-time clock
- Peltier cooling & heating system: precise and fast-acting, vibration-free, low-noise
- Use of cycle-resistant high-performance Peltier elements with long service life
- Environmentally friendly operation without refrigerant
- Forced air circulation in the interior through adjustable turbine
- Self-test: automated check of proper unit function
- Ethernet communication interface for APT-COM® DataControlSystem
- Inner glass door with seal
- Cable entry Ø 30 mm, left-hand side
- Set of castors (4 castors, with parking brake)



KB ECO 240

Advantages:

- Reliable due to uncompromisingly fail-safe operation.
- Smart, as highly customisable to individual customer requirements thanks to a wide range of accessories.
- Economical due to lowest energy consumption thanks to optimised Peltier technology.



KB ECO 1020

Technical data:

| | KB ECO 240 | KB ECO 720 | KB ECO 1020 |
|--|------------|------------|-------------|
| | 230V * | 230V * | 230V * |
| Article Number | 9020-0423 | 9020-0424 | 9020-0425 |
| Performance Data Temperature | | | |
| Temperature range (max. 26°C below ambient temperature) [°C] | - | 0...+70 | 0...+70 |
| Temperature range (max. 28°C below ambient temperature) [°C] | 0...+70 | - | - |
| Temperature variation at 37 °C [± K] | 0,1 | 0,1 | 0,1 |
| Temperature fluctuation at 37 °C [± K] | 0,1 | 0,1 | 0,1 |
| Recovery time after 30 seconds door open at 37 °C [min] | 4 | 4 | 3 |
| Electrical data | | | |
| Rated Voltage [V] | 200...230 | 200...230 | 200...230 |
| Power frequency [Hz] | 50 / 60 | 50 / 60 | 50 / 60 |
| Nominal power [kW] | 0,9 | 1,3 | 1,3 |
| Unit fuse [A] | 16 | 16 | 16 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ | 1~ |
| Outer dimensions | | | |
| Width net [mm] | 925 | 1250 | 1250 |
| Height net [mm] | 1461 | 1925 | 1925 |
| Depth net [mm] | 796 | 885 | 1149 |
| Wall clearance back [mm] | 100 | 100 | 100 |
| Wall clearance sidewise [mm] | 100 | 100 | 100 |
| Doors | | | |
| Inner doors | 1 | 2 | 2 |
| Unit doors | 1 | 2 | 2 |
| Internal Dimensions | | | |
| Width [mm] | 650 | 973 | 973 |
| Height [mm] | 785 | 1250 | 1250 |
| Depth [mm] | 485 | 576 | 836 |
| Further Dimension | | | |
| Interior volume [L] | 247 | 700 | 1020 |
| Net weight of the unit (empty) [kg] | 152 | 272 | 327 |
| permitted load [kg] | 100 | 150 | 150 |
| Load per rack [kg] | 30 | 45 | 45 |
| Environment-specific data | | | |
| Energy consumption at 4 °C [Wh/h] | 100 | 185 | 190 |
| Energy consumption at 37 °C [Wh/h] | 65 | 105 | 105 |
| Sound-pressure level [dB(A)] | 43 | 47 | 47 |
| Fixtures | | | |
| Number of shelves (std./max.) | 2 / 9 | 2 / 15 | 2 / 15 |

* 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 part 2:2015 and 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.

HEATING- AND COOLING CHAMBERS

Series MK: Heating- /Cooling chambers for rapid temperature changes

The MK series chamber is suitable for all heat and cold tests between -40 °C and 180 °C. The MK is a clever alternative to complex individual solutions for cyclical temperature tests.

Features:

- Temperature range: -40 °C to 180 °C
- APT.line™ preheating chamber technology
- Programmable condensation protection for test material
- Heated viewing window with LED interior lighting
- APT-COM™ Basic Edition communication software
- Troubleshooting system with visual and audible alarms
- Intuitive touchscreen controller with time-segment and real-time programming
- Access port with silicone plug (Models 56, 115, 240, 400), 50 mm, left
- 2 access ports with silicone plugs (Model 720, 1020), 80 mm, left and right
- Class 2 independent adjustable temperature safety device (DIN 12880) with visual alarm
- 4 castors, two with brakes, from 115 liters
- Computer interface: Ethernet
- Adjustable ramp function
- Integrated chart recorder
- Real-time clock
- Door heating
- Inner chamber made of stainless steel incl. 1 ss rack
- CFC-free refrigerant R-452A
- Cooling with compressor cooling unit

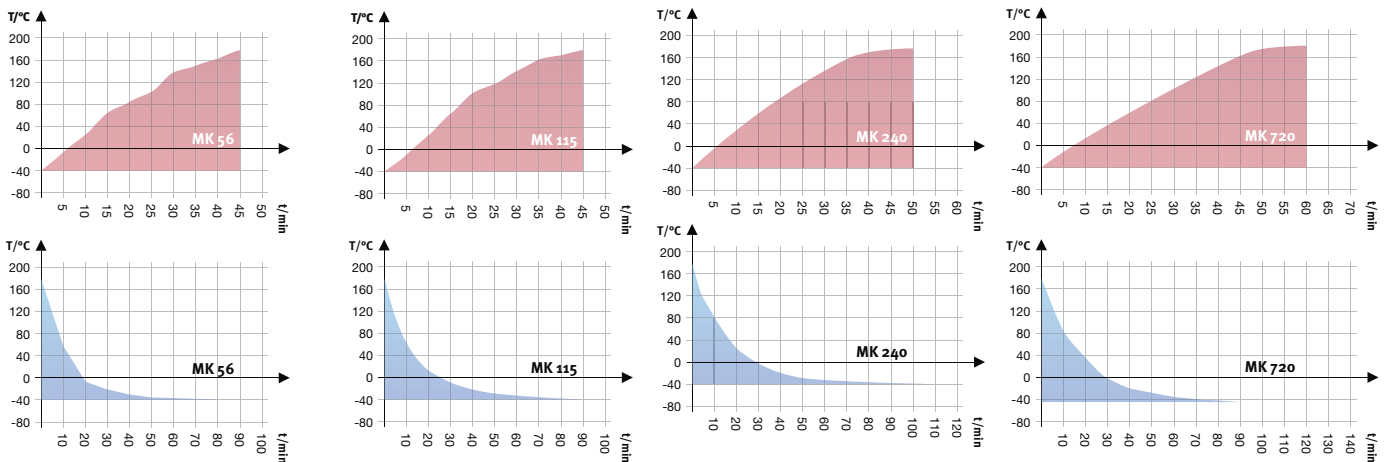


MK 056

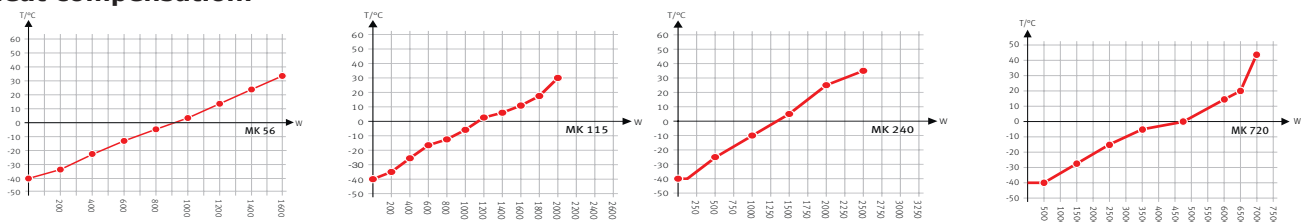


MK 720

Heating up / Cooling down times:



Heat compensation:



Technical data:

| | MK056 | MK115 | MK240 | MK400 | MK720 | MK1020 |
|--|-----------|-----------|-----------|-----------|-----------|-----------|
| | 230V * | 400V * | 400V * | 400V * | 400V * | 400V * |
| Article Number | 9020-0374 | 9020-0375 | 9020-0376 | 9020-0406 | 9020-0377 | 9020-0407 |
| Performance Data Temperature | | | | | | |
| Temperature range [°C] | -40...180 | -40...180 | -40...180 | -40...180 | -40...180 | -40...180 |
| Temperature variation depending on setpoint [± K] | 0,5...1,5 | 0,1...2 | 0,1...1,2 | 0,1...1,2 | 0,3...2 | 0,1...1,8 |
| Temperature fluctuation depending on setpoint [± K] | 0,1...0,5 | 0,1...0,5 | 0,1...0,5 | 0,1...0,5 | 0,1...0,5 | 0,1...0,5 |
| Average heating-up rate according to IEC 60068-3-5 [K/min] | 5 | 5,3 | 5 | 5 | 4 | 5,5 |
| Heating up time from -40 °C to 180 °C [min] | 75 | 55 | 50 | 55 | 96 | 60 |
| Cooling down time from 180 °C to -40 °C [min] | 90 | 90 | 110 | 115 | 100 | 120 |
| Average cooling down time according to IEC 60068-3-5 [K/min] | 5 | 5 | 4,5 | 5 | 4,5 | 5 |
| Max. heat compensation at 20 °C [W] | - | - | - | 4500 | - | 6000 |
| Max. heat compensation at 25 °C [W] | 800 | 1500 | 2000 | - | 3500 | - |
| Electrical data | | | | | | |
| Rated Voltage [V] | 230 | 400 | 400 | 400 | 400 | 400 |
| Power frequency [Hz] | 50 | 50 | 50 | 50 | 50 | 50 |
| Nominal power [kW] | 2,8 | 3,5 | 5,6 | 7 | 8,7 | 11,5 |
| Unit fuse [A] | 16 | 16 | 16 | 16 | 16 | 32 |
| Phase (Nominal voltage) [ph] | 1~ | 3~ | 3~ | 3~ | 3~ | 3~ |
| Outer dimensions | | | | | | |
| Width net [mm] | 720 | 980 | 1115 | 1115 | 1580 | 1580 |
| Height net [mm] | 1445 | 1725 | 1710 | 1710 | 2005 | 2005 |
| Depth net [mm] | 778 | 865 | 925 | 1400 | 1140 | 1480 |
| Wall clearance back [mm] | 300 | 300 | 300 | 500 | 300 | 300 |
| Wall clearance sidewise [mm] | 200 | 200 | 200 | 300 | 200 | 200 |
| Viewing window width [mm] | 288 | 288 | 508 | 508 | 508 | 508 |
| Viewing window height [mm] | 255 | 222 | 300 | 300 | 300 | 300 |
| Doors | | | | | | |
| Unit doors | 1 | 1 | 1 | 1 | 1 | 1 |
| Internal Dimensions | | | | | | |
| Width [mm] | 400 | 600 | 735 | 735 | 1200 | 1200 |
| Height [mm] | 420 | 480 | 700 | 700 | 1020 | 1020 |
| Depth [mm] | 350 | 400 | 443 | 810 | 600 | 810 |
| Further Dimension | | | | | | |
| Interior volume [L] | 60 | 115 | 228 | 417 | 734 | 991 |
| Net weight of the unit (empty) [kg] | 165 | 260 | 340 | 413 | 570 | 621 |
| permitted load [kg] | 60 | 60 | 70 | 150 | 160 | 200 |
| Load per rack [kg] | 15 | 30 | 30 | 30 | 40 | 40 |
| Environment-specific data | | | | | | |
| Sound-pressure level [dB(A)] | 59 | 62 | 62 | 65 | 65 | 65 |
| Fixtures | | | | | | |
| Number of shelves (std./max.) | 1 / 4 | 1 / 4 | 1 / 6 | 1 / 6 | 1 / 11 | 1 / 11 |

* 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. 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.

Series MKT: Heating- /Cooling chambers for rapid temperature changes with extended low temperature range

Temperature ranges between -70 °C and 180 °C, with the added benefit of natural simulation, are what make the MKT series so unique. At the same time, this environmental simulation chamber fulfills the very highest precision and performance requirements for cyclical temperature tests.

Features:

- Temperature range: -70 °C to 180 °C
- 4 zero-voltage relay contacts
- APT.line™ preheating chamber technology
- Programmable condensation protection for test material
- Heated viewing window with LED interior lighting
- APT-COM™ Basic Edition communication software
- Troubleshooting system with visual and audible alarms
- Intuitive touchscreen controller with time-segment and real time programming
- Internal data logger, measured values can be read out in open format via USB
- Access port with silicone plug (Models 115, 240: 50 mm, left)
- 2 access ports with silicone plugs (Model 720: 80 mm, left and right)
- Class 2 independent adjustable temperature safety device (DIN 12880) with visual alarm
- 4 castors, two with brakes
- Computer interface: Ethernet
- Adjustable ramp function
- Integrated chart recorder
- Real-time clock
- Door heating
- Inner chamber made of stainless steel with 1 ss rack
- CFC-free refrigerants R-452A and R-23
- Cooling with cascade compressor cooling unit

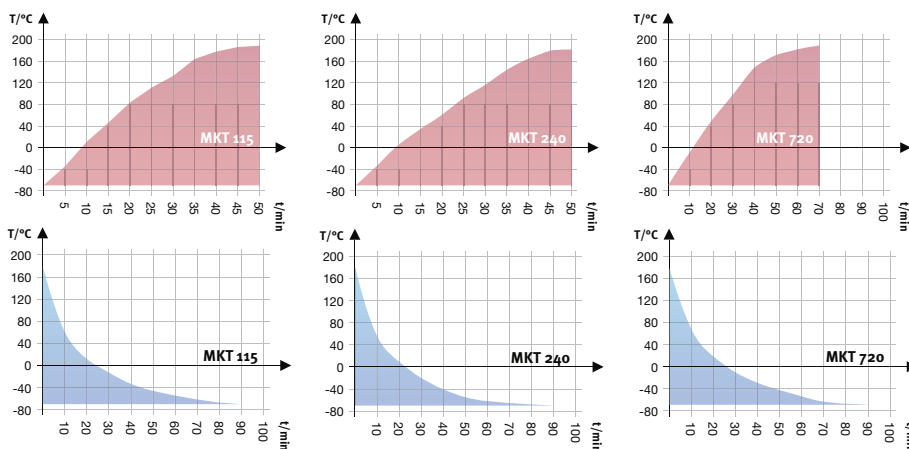


MKT 115

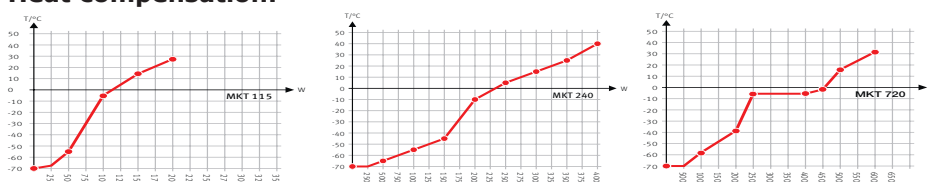


MKT 115

Heating up / Cooling down times:



Heat compensation:



Technical data:

| | MKT115 | MKT240 | MKT720 |
|--|-----------|-----------|-----------|
| | 400V * | 400V * | 400V * |
| Article Number | 9020-0385 | 9020-0386 | 9020-0387 |
| Performance Data Temperature | | | |
| Temperature range [°C] | -70...180 | -70...180 | -70...180 |
| Temperature variation depending on setpoint [± K] | 0,2...1,8 | 0,1...1,0 | 0,3...2 |
| Temperature fluctuation depending on setpoint [± K] | 0,1...0,6 | 0,1...0,4 | 0,1...0,5 |
| Average heating-up rate according to IEC 60068-3-5 [K/min] | 5,3 | 5 | 4,5 |
| Cooling down time from 180 °C to -70 °C [min] | 110 | 95 | |
| Cooling down time from 180 °C to -40 °C [min] | | | 120 |
| Average cooling down time according to IEC 60068-3-5 [K/min] | 4,2 | 4,2 | 4,0 |
| Max. heat compensation at 25 °C [W] | 1500 | 3200 | 5000 |
| Electrical data | | | |
| Rated Voltage [V] | 400 | 400 | 400 |
| Power frequency [Hz] | 50 | 50 | 50 |
| Nominal power [kW] | 5,5 | 6,5 | 13 |
| Unit fuse [A] | 16 | 16 | 32 |
| Phase (Nominal voltage) [ph] | 3~ | 3~ | 3~ |
| Outer dimensions | | | |
| Width net [mm] | 980 | 1115 | 1580 |
| Height net [mm] | 1725 | 1935 | 2005 |
| Depth net [mm] | 865 | 925 | 1140 |
| Wall clearance back [mm] | 300 | 300 | 300 |
| Wall clearance sidewise [mm] | 200 | 200 | 200 |
| Viewing window width [mm] | 228 | 508 | 508 |
| Viewing window height [mm] | 222 | 300 | 300 |
| Doors | | | |
| Unit doors | 1 | 1 | 1 |
| Internal Dimensions | | | |
| Width [mm] | 600 | 735 | 1200 |
| Height [mm] | 480 | 700 | 1020 |
| Depth [mm] | 400 | 443 | 600 |
| Further Dimension | | | |
| Interior volume [L] | 115 | 228 | 734 |
| Net weight of the unit (empty) [kg] | 305 | 380 | 610 |
| permitted load [kg] | 60 | 70 | 160 |
| Load per rack [kg] | 30 | 30 | 40 |
| Environment-specific data | | | |
| Sound-pressure level [dB(A)] | 64 | 64 | 65 |
| Fixtures | | | |
| Number of shelves (std./max.) | 1/4 | 1/6 | 1/11 |

* 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. 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.

CONSTANT CLIMATE CHAMBERS

Series KBF: Constant climate chambers with large temperature / humidity range

The KBF is the specialist for unconditionally reliable stability testing and precise maintenance of constant climate conditions. From programming to documentation, this constant climate chamber meets all critical requirements.

Features:

- Temperature range: 0 °C to 70 °C
- Humidity range: 10 % to 80 % RH
- APT.line™ preheating chamber technology
- Humidity regulation with capacitive humidity sensor and vapor humidification
- Intuitive touchscreen controller with time-segment and real-time programming
- Multi-Management Software APT-COM™ Basic Edition
- Inner chamber made of stainless steel
- Internal data logger, measured values can be read out in open format via USB
- Unit self-test for comprehensive status analysis
- Tightly-sealed inner door made of tempered safety glass
- Avoidance of glass corrosion by special TIMELESS coating
- Inner chamber made of stainless steel
- 2 stainless steel racks
- Access port with silicone plug, 30 mm, left
- 4 stable castors, two with brakes, from 240 liters
- Class 3.1 independent temperature safety device (DIN 12880) with visual and audible temperature alarm
- Computer interface: Ethernet
- Door heating

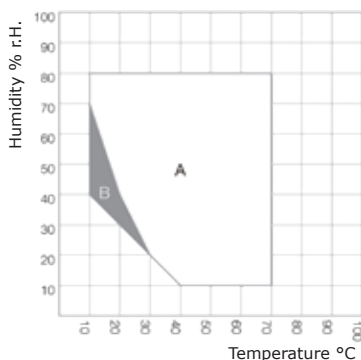


KBF 1020



KBF 240

Temperature-humidity chart



A: Standard Climate range
B: Discontinuous range

Technical data:

| | KBF115 | KBF240 | KBF720 | KBF1020 |
|--|-------------|--------------|--------------|--------------|
| | 230V * | 230V * | 230V * | 230V * |
| Article Number | 9020-0320 | 9020-0322 | 9020-0324 | 9020-0326 |
| Performance Data Temperature | | | | |
| Temperature range [°C] | 0...70 | 0...70 | 0...70 | 0...70 |
| Temperature variation at 40 °C [± K] | 0,2 | 0,3 | 0,2 | 0,2 |
| Temperature fluctuation [± K] | 0,1 | 0,1 | 0,1 | 0,5 |
| Max. heat compensation at 40 °C [W] | 200 | 300 | 600 | 600 |
| Performance Data Climate | | | | |
| Temperature range [°C] | 10...70 | 10...70 | 10...70 | 10...70 |
| Temperature variation at 25 °C and 60 % RH [± K] | 0,2 | 0,3 | 0,2 | 0,2 |
| Temperature variation at 40 °C and 75 % RH [± K] | 0,2 | 0,3 | 0,2 | 0,2 |
| Temperature fluctuation at 25 °C and 60 % RH [± K] | 0,1 | 0,1 | 0,1 | 0,1 |
| Temperature fluctuation at 40 °C and 75 % RH [± K] | 0,1 | 0,1 | 0,1 | 0,1 |
| Humidity range [% RH] | 10...80 | 10...80 | 10...80 | 10...80 |
| Humidity fluctuation at 25 °C and 60 % RH | ≤2 ± % r.F. | 1,5 ± % r.F. | 1,5 ± % r.F. | 1,5 ± % r.F. |
| Humidity fluctuation at 40 °C and 75 % RH | ≤2 ± % r.F. | 1,5 ± % r.F. | 1,5 ± % r.F. | 1,5 ± % r.F. |
| Electrical data | | | | |
| Rated Voltage [V] | 200...230 | 200...230 | 200...230 | 200...230 |
| Power frequency [Hz] | 50/60 | 50/60 | 50/60 | 50/60 |
| Nominal power [kW] | 2 | 2,1 | 3,1 | 3,1 |
| Unit fuse [A] | 16 | 16 | 16 | 16 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ | 1~ | 1~ |
| Outer dimensions | | | | |
| Width net [mm] | 880 | 925 | 1250 | 1250 |
| Height net [mm] | 1050 | 1460 | 1925 | 1925 |
| Depth net [mm] | 650 | 800 | 890 | 1145 |
| Wall clearance back [mm] | 100 | 100 | 100 | 100 |
| Wall clearance sidewise [mm] | 100 | 100 | 300 | 100 |
| Doors | | | | |
| Inner doors | 1 | 1 | 2 | 2 |
| Unit doors | 1 | 1 | 2 | 2 |
| Internal Dimensions | | | | |
| Width [mm] | 600 | 650 | 973 | 973 |
| Height [mm] | 483 | 785 | 1250 | 1250 |
| Depth [mm] | 351 | 485 | 576 | 836 |
| Further Dimension | | | | |
| Interior volume [L] | 102 | 247 | 700 | 1020 |
| Net weight of the unit (empty) [kg] | 128 | 189 | 312 | 379 |
| permitted load [kg] | 100 | 100 | 150 | 150 |
| Load per rack [kg] | 30 | 30 | 45 | 45 |
| Environment-specific data | | | | |
| Energy consumption at 40 °C and 75 % RH [Wh/h] | 470 | 650 | 620 | 650 |
| Sound-pressure level [dB(A)] | 52 | 52 | 53 | 56 |
| Fixtures | | | | |
| Number of shelves (std./max.) | 2/5 | 2/9 | 2/15 | 2/15 |

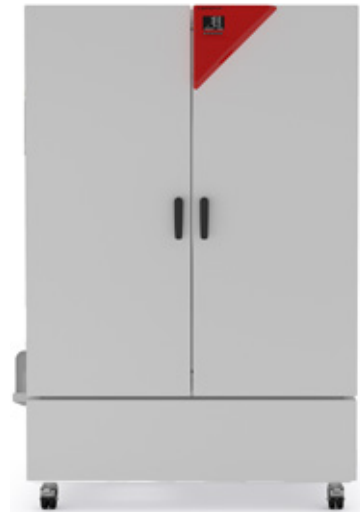
* All technical data is specified for unloaded units with standard equipment at an ambient temperature of +22 °C ±3 °C and a power supply voltage fluctuation of ±10 %. The temperature data is determined in accordance to BINDER factory standard following DIN 12880, observing the recommended wall clearances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

Series KBF-S ECO Solid Line: Constant climatic chambers with Peltier technology

Thanks to thermoelectric cooling technology with patented heat dissipation, the new KBF-S ECO climatic chamber is one of the most energy-efficient constant climate chambers on the market. The thermoelectric cooling technology means the KBF-S ECO series is also very quiet during operation.

Features:

- Temperature range: 0 °C to +70 °C (max. 24 °C under ambient temperature)
- Humidity range: 10% to 80% RH
- APT.line™ preheating chamber technology
- Independent water supply via tank
- LCD to display temperature and humidity along with additional information and alarms
- Internal data logger, measured values can be read out in open format via USB
- Unit self-test for comprehensive status analysis
- Inner chamber made completely of stainless steel
- 2 stainless steel racks, including shelf carrier
- Access port with silicone plug Ø 30 mm, left



KBF S-ECO 720

Benefits:

- Safe thanks to standard-compliant testing according to the ICH Q1A guideline, even with full load.
- Reliable thanks to failsafe operation without compromise.
- Smart, as a wide range of accessories makes it highly compatible for adaptation to specific customer requirements.
- Economical, as energy consumption is minimal thanks to optimized thermoelectric cooling.



KBF S-ECO 1020

Technical data:

| | KBF-S ECO 240 | KBF-S ECO 720 | KBF-S ECO 1020 |
|--|------------------|------------------|-------------------|
| Article Number | 9020-0416 | 9020-0418 | 9020-0419 |
| Performance Data Temperature | | | |
| Temperature range [°C] | 0...70 | 0...70 | 0...70 |
| Temperature variation at 40 °C [± K] | 0,2 | 0,3 | 0,5 |
| Temperature fluctuation [± K] | 0,1 | 0,1 | 0,1 |
| Max. heat compensation at 40 °C [W] | 250 | 400 | 400 |
| Performance Data Climate | | | |
| Temperature range [°C] | 5...70 | 5...70 | 5...70 |
| Temperature variation at 25 °C and 60 % RH [± K] | 0,1 | 0,1 | 0,1 |
| Temperature variation at 40 °C and 75 % RH [± K] | 0,2 | 0,3 | 0,5 |
| Temperature fluctuation at 25 °C and 60 % RH [± K] | 0,1 | 0,1 | 0,1 |
| Temperature fluctuation at 40 °C and 75 % RH [± K] | 0,1 | 0,1 | 0,1 |
| Humidity range [% RH] | 10...80 | 10...80 | 10...80 |
| Humidity fluctuation at 25 °C and 60 % RH | 0,3 ± % r.F. | 0,3 ± % r.F. | 0,4 ± % r.F. |
| Humidity fluctuation at 40 °C and 75 % RH | 0,3 ± % r.F. | 0,3 ± % r.F. | 0,4 ± % r.F. |
| Electrical data | | | |
| Rated Voltage [V] | 200...230 | 200...230 | 200...230 |
| Power frequency [Hz] | 50/60 | 50/60 | 50/60 |
| Nominal power [kW] | 0,8 | 1,2 | 1,2 |
| Unit fuse [A] | 16 | 16 | 16 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ | 1~ |
| Outer dimensions | | | |
| Width net [mm] | 925 | 1250 | 1250 |
| Height net [mm] | 1461 | 1925 | 1925 |
| Depth net [mm] | 796 | 885 | 1149 |
| Wall clearance back [mm] | 100 | 100 | 100 |
| Wall clearance sidewise [mm] | 180 | 180 | 180 |
| Doors | | | |
| Unit doors | 1 | 2 | 2 |
| Internal Dimensions | | | |
| Width [mm] | 650 | 973 | 973 |
| Height [mm] | 785 | 1250 | 1250 |
| Depth [mm] | 485 | 576 | 836 |
| Further Dimension | | | |
| Interior volume [L] | 247 | 700 | 1020 |
| Net weight of the unit (empty) [kg] | 146 | 267 | 322 |
| permitted load [kg] | 100 | 150 | 150 |
| Load per rack [kg] | 30 | 45 | 45 |
| Environment-specific data | | | |
| Energy consumption at 40 °C and 75 % RH [Wh/h] | 85 | 130 | 135 |
| Sound-pressure level [dB(A)] | 46 | 48 | 49 |
| Fixtures | | | |
| Number of shelves (std./max.) | 2/9 | 2/15 | 2/15 |

* 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. For model KBF-S ECO 240, temperature differences are possible up to 28 °C below ambient temperature; for models KBF-S ECO 720 and KBF-S ECO 1020, temperature differences are possible up to 24 °C below ambient temperature. The lowest operating temperature for all units is 0 °C irrespective of the ambient temperature.

Series KMF: Constant climate chambers with expanded temperature / humidity range

The KMF ensures absolutely constant test conditions throughout the testing area. A big advantage of this constant climate chamber is its low space requirement and flexibility in terms of water supply. The wide temperature and humidity range make this constant climate chamber ideally suited for stress testing series.

Features:

- Temperature range: -10 °C to 100 °C
- Humidity range: 10 % RH to 98 % RH
- APT.line™ preheating chamber technology
- Humidity regulation with capacitive humidity sensor and vapor humidification
- Inner chamber made of stainless steel
- APT-COM™ Basic Edition communication software
- Intuitive touchscreen controller with time-segment and real-time programming
- Internal data logger, measured values can be read out in open format via USB
- Unit self-test for comprehensive status analysis
- Tightly-sealed inner door made of tempered safety glass (ESG)
- Avoidance of glass corrosion by special TIMELESS coating
- 1 stainless steel rack
- Access port with silicone plug, 30 mm, left
- Class 3.1 independent temperature safety device (DIN 12880) with visual and audible temperature alarm
- Computer interface: Ethernet
- Door heating

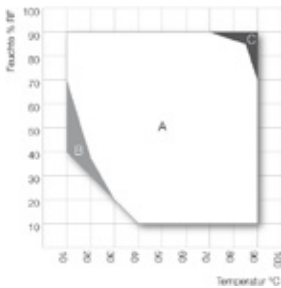


KMF 115



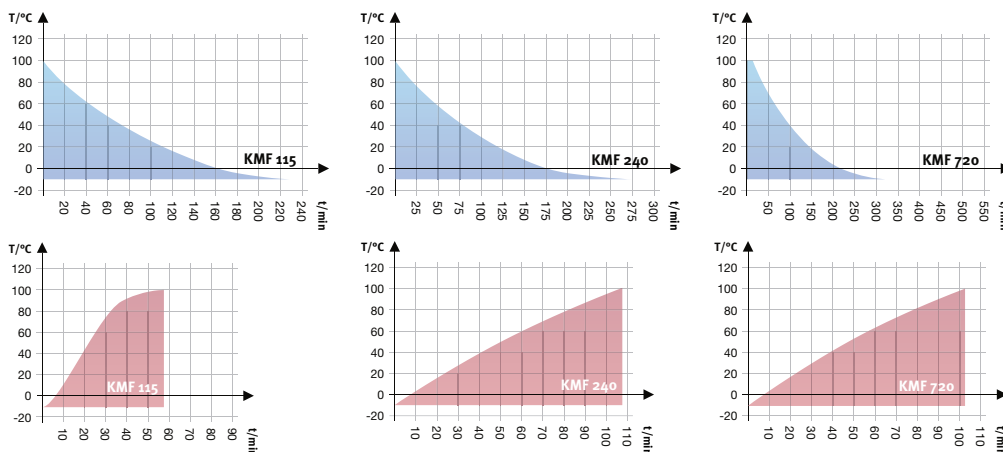
KMF 240

Temperature-humidity chart



- A: Standard Climate range
- B: Discontinuous range
- C: In this range, condensation in the inner chamber is possible

Heating up / Cooling down times:



Technical data:

| | KMF115 | KMF240 | KMF720 |
|--|---------------|-------------|-------------|
| | 230V * | 230V * | 230V * |
| Article Number | 9020-0341 | 9020-0343 | 9020-0345 |
| Performance Data Temperature | | | |
| Temperature range [°C] | -10...100 | -10...100 | -10...100 |
| Average heating-up rate according to IEC 60068-3-5 [K/min] | 1,3 | 0,8 | 0,7 |
| Average cooling down time according to IEC 60068-3-5 [K/min] | 0,5 | 0,4 | 0,4 |
| Max. heat compensation at 25 °C [W] | 150 | 200 | 450 |
| Performance Data Climate | | | |
| Temperature range [°C] | 10...90 | 10...90 | 10...90 |
| Temperature variation depending on setpoint [± K] | 0,2...1 | 0,1...1 | 0,1...1 |
| Temperature fluctuation depending on setpoint [± K] | 0,1...0,3 | 0,1...0,3 | 0,1...0,5 |
| Humidity range [% RH] | 10...98 | 10...98 | 10...98 |
| Humidity fluctuation depending on setpoint | ≤2,5 ± % r.F. | ≤2 ± % r.F. | ≤2 ± % r.F. |
| Dew point temperature range [°C] | 5...90 | 5...90 | 5...90 |
| Electrical data | | | |
| Rated Voltage [V] | 200...230 | 200...230 | 200...230 |
| Power frequency [Hz] | 50/60 | 50/60 | 50/60 |
| Nominal power [kW] | 2 | 2,1 | 3,1 |
| Unit fuse [A] | 16 | 16 | 16 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ | 1~ |
| Outer dimensions | | | |
| Width net [mm] | 880 | 930 | 1250 |
| Height net [mm] | 1050 | 1465 | 1925 |
| Depth net [mm] | 650 | 800 | 890 |
| Wall clearance back [mm] | 100 | 100 | 100 |
| Wall clearance sidewise [mm] | 100 | 100 | 100 |
| Doors | | | |
| Inner doors | 1 | 1 | 2 |
| Unit doors | 1 | 1 | 2 |
| Internal Dimensions | | | |
| Width [mm] | 600 | 650 | 973 |
| Height [mm] | 483 | 785 | 1250 |
| Depth [mm] | 351 | 485 | 576 |
| Further Dimension | | | |
| Interior volume [L] | 102 | 247 | 700 |
| Net weight of the unit (empty) [kg] | 128 | 189 | 306 |
| permitted load [kg] | 100 | 100 | 150 |
| Load per rack [kg] | 30 | 30 | 45 |
| Environment-specific data | | | |
| Energy consumption at 85 °C and 85 % RH [Wh/h] | 570 | 570 | 900 |
| Sound-pressure level [dB(A)] | 52 | 52 | 56 |
| Fixtures | | | |
| Number of shelves (std./max.) | 1/5 | 1/9 | 1/15 |

* 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. 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.

DYNAMIC CLIMATE CHAMBERS

Series MKF: Dynamic climate chambers for rapid temperature changes with humidity control

A MKF series environmental simulation chamber is ideally suited for any cold and heat testing based on current temperature and climate testing methods according to DIN and IEC standards. The comprehensive standard equipment for this environmental simulation chamber ensures ease of operation.

Features:

- Temperature range: -40 °C to 180 °C
- Humidity range: 10*%) to 98 % RH
- Integrated water-storage tank, 20 liters (not MKF056)
- 4 zero-voltage relay contacts
- APT.line™ preheating chamber technology
- Intuitive touchscreen controller with time-segment and real-time programming with integrated chart recorder
- Internal data logger, read out in open format via USB
- Programmable condensation protection for test material
- Heated door/viewing window with LED interior lighting
- Humidity regulation with capacitive humidity sensor and vapor humidification
- APT-COM™ Basic Edition communication software
- Troubleshooting system with visual and audible alarms
- Access port with silicone plug (056, 115, 240, 400: 50 mm, left)
- 2 access ports with silicone plugs (720, 1020: 80 mm, left and right)
- Class 2 adjustable temp. safety device with visual alarm
- 4 castors, two with brakes
- Computer interface: Ethernet
- Adjustable ramp function
- Real-time clock
- Alarm notification in the event of insufficient water in fresh water tank (Models 115, 240, 400, 720, 1020)
- Complete safety connection kit for water supply and drainage, up to 1 m height
- Inner chamber made of stainless steel with 1 SS Rack
- CFC-free refrigerant R-452A

*) 598% r. H. with optional orderable compressed air dryer (Automotive Tests)

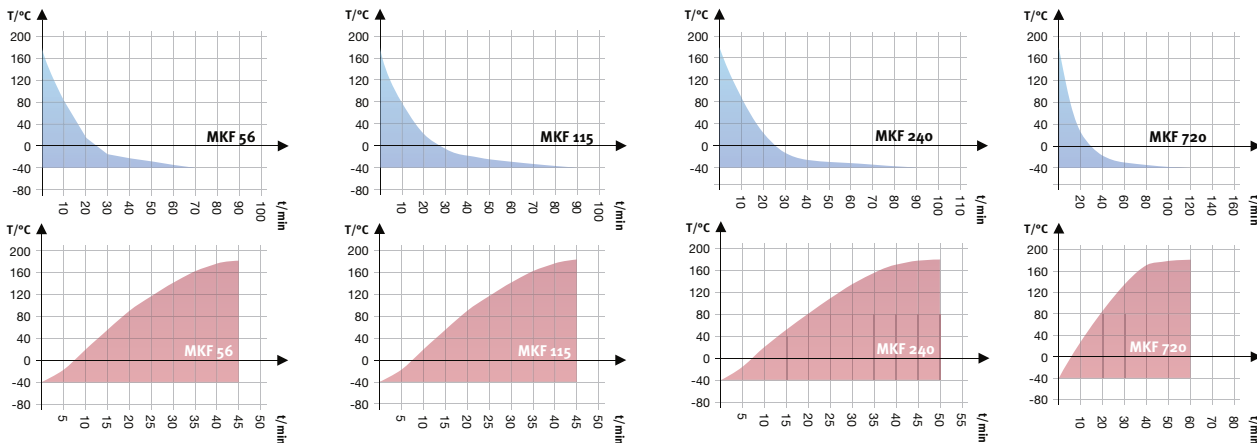


MKF 240

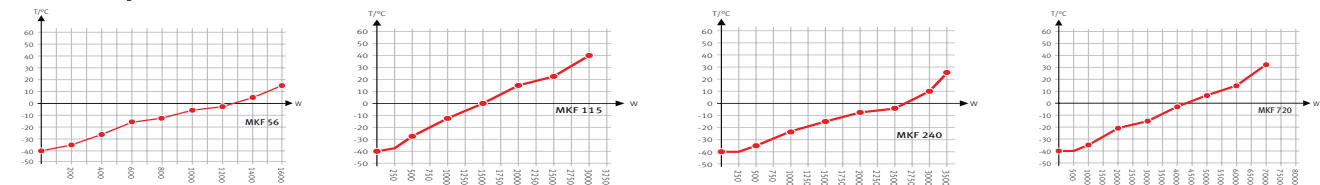


MKF 240

Heating up / Cooling down times:



Heat compensation:



Technical data:

| | MKF056 | MKF115 | MKF240 | MKF400 | MKF720 | MKF1020 |
|--|-----------|-----------|-----------|-----------|-----------|-----------|
| | 230V * | 400V * | 400V * | 400V * | 400V * | 400V * |
| Article Number | 9020-0378 | 9020-0379 | 9020-0380 | 9020-0408 | 9020-0381 | 9020-0409 |
| Performance Data Temperature | | | | | | |
| Temperature range [°C] | -40...180 | -40...180 | -40...180 | -40...180 | -40...180 | -40...180 |
| Temperature variation depending on setpoint [± K] | 0,5...1,5 | 0,1...1,3 | 0,1...1,5 | 0,1...1,2 | 0,1...1,8 | 0,1...1,8 |
| Temperature fluctuation depending on setpoint [± K] | 0,1...0,5 | 0,1...0,6 | 0,1...0,5 | 0,1...0,5 | 0,1...0,5 | 0,1...0,5 |
| Average heating-up rate according to IEC 60068-3-5 [K/min] | 5 | 5,5 | 5 | 5 | 4,8 | 5,5 |
| Heating up time from -40 °C to -40 °C [min] | 60 | 60 | 60 | 55 | 85 | 60 |
| Cooling down time from 180 °C to -40 °C [min] | 90 | 100 | 120 | 115 | 120 | 120 |
| Average cooling down time acc. to IEC 60068-3-5 [K/min] | 5 | 4,5 | 5 | 5 | 4,8 | 5 |
| Max. heat compensation at 20 °C [W] | - | - | - | 4500 | - | 6000 |
| Max. heat compensation at 25 °C [W] | 1200 | 2100 | 2800 | - | 5800 | - |
| Performance Data Climate | | | | | | |
| Temperature range [°C] | 10...95 | 10...95 | 10...95 | 10...95 | 10...95 | 10...95 |
| Temperature variation depending on setpoint [± K] | 0,5...1,5 | - | - | 0,1...1,5 | - | 0,1...2 |
| Temperature fluctuation depending on setpoint [± K] | 0,1...0,5 | 0,1...1,3 | 0,1...1,3 | 0,1...1,3 | 0,2...1,5 | 0,1...1,5 |
| Humidity range [% RH] | 10...98 | 10...98 | 10...98 | 10...98 | 10...98 | 10...98 |
| Humidity fluctuation depending on setpoint [± %] r.F. | ≤2,5 | ≤2,5 | ≤2,5 | 2,5 | ≤2,5 | 2,5 |
| Dew point temperature range [°C] | 5...94 | 5...94 | 5...94 | 5...94 | 5...94 | 5...94 |
| Electrical data | | | | | | |
| Rated Voltage [V] | 200...230 | 400 | 400 | 400 | 400 | 400 |
| Power frequency [Hz] | 50 | 50 | 50 | 50 | 50 | 50 |
| Nominal power [kW] | 2,8 | 4,8 | 6,8 | 8 | 11 | 12,5 |
| Unit fuse [A] | 16 | 16 | 16 | 16 | 32 | 32 |
| Phase (Nominal voltage) [ph] | 1~ | 3~ | 3~ | 3~ | 3~ | 3~ |
| Outer dimensions | | | | | | |
| Width net [mm] | 720 | 980 | 1115 | 1115 | 1580 | 1580 |
| Height net [mm] | 1445 | 1725 | 1715 | 1710 | 2005 | 2005 |
| Depth net [mm] | 780 | 865 | 925 | 1400 | 1140 | 1140 |
| Wall clearance back [mm] | 300 | 300 | 300 | 500 | 300 | 300 |
| Wall clearance sidewise [mm] | 200 | 200 | 200 | 300 | 200 | 200 |
| Viewing window width [mm] | 288 | 288 | 508 | 508 | 508 | 508 |
| Viewing window height [mm] | 255 | 222 | 300 | 300 | 300 | 300 |
| Doors | | | | | | |
| Unit doors | 1 | 1 | 1 | 1 | 1 | 1 |
| Internal Dimensions | | | | | | |
| Width [mm] | 400 | 600 | 735 | 735 | 1200 | 1200 |
| Height [mm] | 420 | 480 | 700 | 700 | 1020 | 1020 |
| Depth [mm] | 348 | 400 | 443 | 810 | 600 | 810 |
| Further Dimension | | | | | | |
| Interior volume [L] | 60 | 115 | 228 | 417 | 734 | 991 |
| Net weight of the unit (empty) [kg] | 175 | 280 | 360 | 432 | 590 | 636 |
| permitted load [kg] | 60 | 60 | 70 | 150 | 160 | 160 |
| Load per rack [kg] | 15 | 30 | 30 | 30 | 40 | 40 |
| Environment-specific data | | | | | | |
| Sound-pressure level [dB(A)] | 59 | 62 | 65 | 65 | 65 | 69 |
| Fixtures | | | | | | |
| Number of shelves (std./max.) | 1/4 | 1/4 | 1/6 | 1/6 | 1/11 | 1/11 |

* 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. 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.

Series MKFT: Dynamic climate chambers for rapid temperature changes with humidity control and extended low temperature range

The environmental simulation cabinet of the MKFT series is the specialist for dynamic climate changes between -70 °C and 180 °C. Large power reserves and fast cooling make it a high-class product for complex standard-compliant climate tests.

Features:

- Temperature range: -70 °C to 180 °C
- Humidity range: 10*) % to 98 % RH
- Integrated water-storage tank, 20 liters
- 4 zero-voltage relay contacts
- APT.line™ preheating chamber technology
- Programmable condensation protection for test material
- Intuitive touchscreen controller with time-segment and real-time programming and integrated chart recorder
- Internal data logger, values can be read out via USB
- Heated door/viewing window with LED interior lighting
- Humidity regulation with capacitive humidity sensor and vapor humidification
- APT-COM™ Basic Edition communication software
- Troubleshooting system with visual and audible alarms
- Class 2 independent adjustable temperature safety device (DIN 12880) with visual alarm
- Access port with silicone plug (115, 240: 50 mm, left)
- 2 access ports with silicone plugs (720: 80 mm, left and right)
- 4 castors, two with brakes
- Computer interface: Ethernet
- Adjustable ramp function
- Real-time clock
- Alarm notification in the event of insufficient water in fresh water tank
- Complete safety connection kit for water supply and drainage, up to 1 m in height
- Inner chamber made of stainless steel with 1 SS-rack
- CFC-free refrigerants R-452A and R-23

*) 5 ...98% r. H. with optional orderable compressed air dryer (Automotive Tests)

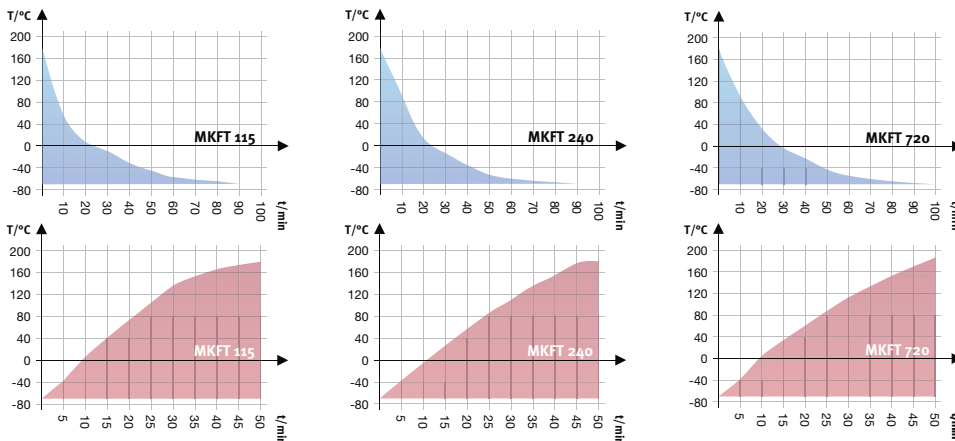


MKFT 115

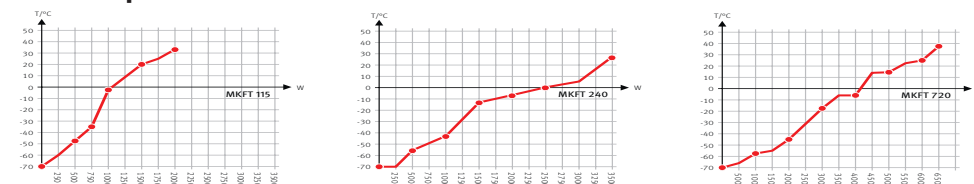


MKFT 115

Heating up / Cooling down times:



Heat compensation:



Technical data:

| | MKFT115 | MKFT240 | MKFT720 |
|--|---------------|---------------|---------------|
| | 400V * | 400V * | 400V * |
| Article Number | 9020-0382 | 9020-0383 | 9020-0384 |
| Performance Data Temperature | | | |
| Temperature range [°C] | -70...180 | -70...180 | -70...180 |
| Temperature variation depending on setpoint [± K] | 0,1...1,3 | 0,2...1,8 | 0,3...2,0 |
| Temperature fluctuation depending on setpoint [± K] | 0,1...0,1 | 0,1...0,5 | 0,1...0,1 |
| Average heating-up rate according to IEC 60068-3-5 [K/min] | 5,5 | 5 | 4,8 |
| Average cooling down time according to IEC 60068-3-5 [K/min] | 4,2 | 4,2 | 4 |
| Max. heat compensation at 25 °C [W] | 1500 | 3000 | 4500 |
| Performance Data Climate | | | |
| Temperature range [°C] | 10...95 | 10...95 | 10...95 |
| Temperature fluctuation depending on setpoint [± K] | 0,1...1 | 0,1...1,5 | 0,1...1 |
| Humidity range [% RH] | 10...98 | 10...98 | 10...98 |
| Humidity fluctuation depending on setpoint | ≤2,5 ± % r.F. | ≤2,5 ± % r.F. | ≤2,5 ± % r.F. |
| Dew point temperature range [°C] | 5...94 | 5...94 | 5...94 |
| Electrical data | | | |
| Rated Voltage [V] | 400 | 400 | 400 |
| Power frequency [Hz] | 50 | 50 | 50 |
| Nominal power [kW] | 5,0 | 6,0 | 11 |
| Unit fuse [A] | 16 | 16 | 32 |
| Phase (Nominal voltage) [ph] | 3~ | 3~ | 3~ |
| Outer dimensions | | | |
| Width net [mm] | 980 | 1115 | 1580 |
| Height net [mm] | 1725 | 1940 | 2005 |
| Depth net [mm] | 865 | 925 | 1140 |
| Wall clearance back [mm] | 300 | 300 | 300 |
| Wall clearance sidewise [mm] | 200 | 200 | 200 |
| Viewing window width [mm] | 288 | 508 | 508 |
| Viewing window height [mm] | 222 | 300 | 300 |
| Doors | | | |
| Unit doors | 1 | 1 | 1 |
| Internal Dimensions | | | |
| Width [mm] | 600 | 735 | 1200 |
| Height [mm] | 480 | 700 | 1020 |
| Depth [mm] | 400 | 443 | 600 |
| Further Dimension | | | |
| Interior volume [L] | 115 | 228 | 734 |
| Net weight of the unit (empty) [kg] | 330 | 415 | 635 |
| permitted load [kg] | 60 | 70 | 160 |
| Load per rack [kg] | 30 | 30 | 40 |
| Environment-specific data | | | |
| Sound-pressure level [dB(A)] | 64 | 67 | 69 |
| Fixtures | | | |
| Number of shelves (std./max.) | 1/4 | 1/6 | 1/11 |

* 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. 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.

◆ DEEP FREEZERS

TT and KBT series: Freezers for low temperature tests/storage

The TT freezers and KBT mini freezers with up to 90 litres capacity are small appliances for cooling and freezing. They are used in a variety of applications in the laboratory, in research and in industry. The compact, space-saving design with a quiet, low-noise refrigeration unit makes these freezers particularly suitable for use directly at the workplace.

Features / Equipment: series KBT:

- Cooling unit: low-noise, fully hermetic, air-cooled, low-maintenance
- Housing parts made of stainless steel
- Insulated stainless steel lid with hinges and magnetic seal
- Peripheral impact protection rings at top and bottom
- Controller unit ST71:
 - Electronic temperature control with LED display
 - Visual and acoustic alarm signal
- Controller ST100:
 - Microprocessor-controlled regulation with membrane keypad
 - maximum safety due to mains-independent alarm with rechargeable battery for approx. 72 hours
 - various interfaces



KBT 08-51

Features / Equipment: series TT:

- Optimum use of interior space: use of vacuum insulation panels (VIP) allows a large interior space with compact external dimensions
- Extremely quiet refrigeration unit
- Interior made of high-quality stainless steel
- Cable gland (diameter 19mm)
- Insulating lid with lockable lid lock
- Controller „Standard“:
 - Microprocessor-controlled regulation with membrane keypad
 - maximum safety due to mains-independent alarm with rechargeable battery for approx. 72 hours
 - various interfaces
- Controller „//logg“:
 - Touchscreen control with colour display and integrated data logger for full traceability
 - maximum safety due to mains-independent alarm with rechargeable battery for approx. 72 hours
 - various interfaces



TT85-90 logg

Options:

- Mobile version for TS series
- Recirculation fan for even temperature distribution throughout the interior

Technical data KBT-series:

| | KBT 08-51 | KBT 08-51 ST100 | KBT 08-41 U ST 100 |
|-------------------------------------|-----------|--------------------|-----------------------|
| Performance Data Temperature | | | |
| Control | ST71 | ST100 | ST100 |
| Temperature range [°C] | -30...-50 | -30...-50 | -20...-40 |
| Control accuracy [± K] | 1 | 1 | 1 |
| Ambient temperature [° C] | +12...+30 | +12...+30 | +12...+30 |
| Electrical data | | | |
| Rated Voltage [V] | 230 | 230 | 230 |
| Power frequency (±10%) [Hz] | 50 | 50 | 50 |
| Outer dimensions | | | |
| Width net [mm] | 360 | 360 | 520 |
| Height net [mm] | 570 | 570 | 580 |
| Depth net [mm] | 490 | 490 | 520 |
| Wall clearance back [mm] | 100 | 100 | 100 |
| Wall clearance sidewise [mm] | 160 | 160 | 160 |
| Internal Dimensions | | | |
| Width [mm] | 150 | 150 | 300 |
| Height [mm] | 200 | 200 | 200 |
| Depth [mm] | 300 | 300 | 270 (320)** |
| Interior volume [L] | 8 | 8 | 16 (18)** |
| Net weight of the unit (empty) [kg] | 36 | 36 | 50 |

*) corners rounded; **) reduced by circulating air

Technical data TT-series:

| | TT 50-90 | TT 50-90 //logg | TT 85-90 | TT 85-90 //logg |
|-------------------------------------|-----------|--------------------|-----------|--------------------|
| Performance Data Temperature | | | | |
| Temperature range [°C] | -10...-50 | -10...-50 | -50...-85 | -50...-85 |
| Control accuracy [± K] | 1 | 1 | 1 | 1 |
| Ambient temperature [° C] | +12...+30 | +12...+30 | +12...+30 | +12...+30 |
| Electrical data | | | | |
| Rated Voltage [V] | 230 | 230 | 230 | 230 |
| Power frequency (±10%) [Hz] | 50 | 50 | 50 | 50 |
| Outer dimensions | | | | |
| Width net [mm] | 760 | 760 | 760 | 760 |
| Height net [mm] | 880 | 880 | 880 | 880 |
| Depth net [mm] | 710 | 710 | 710 | 710 |
| Wall clearance back [mm] | 100 | 100 | 100 | 100 |
| Wall clearance sidewise [mm] | 160 | 160 | 160 | 160 |
| Internal Dimensions | | | | |
| Width [mm] | 590 | 590 | 590 | 590 |
| Height [mm] | 370 | 370 | 370 | 370 |
| Depth [mm] | 430 | 430 | 430 | 430 |
| Interior volume [L] | 90 | 90 | 90 | 90 |
| Net weight of the unit (empty) [kg] | 92 | 110 | 92 | 110 |

TS and TUS series: Upright and underbench freezers

Small Freezers TS and Underbench Freezers TUS are designed for decentralized freezing and for storage of materials directly at the workplace. With their compact, space saving construction and the quiet refrigeration system (comparable to home freezers, no noise pollution at the workplace) these types are optimized to being placed directly in the laboratory. The freezers are fitted with hermetically sealed, intrinsically safe, air-cooled refrigeration systems and are maintenance free.

Features series TS:

- Large interior space with small external dimensions due to vacuum insulation (VIP)
- Extremely quiet refrigeration unit
- Microprocessor-controlled regulation with membrane keypad (Standard)
- Touchscreen control with colour display and integrated data logger for full traceability (//logg)
- Maximum safety due to mains-independent alarm with rechargeable battery for approx. 72 hours
- Various interfaces
- Interior made of high-quality stainless steel
- Cable gland (diameter 19mm)
- Insertion grille (stainless steel) variably positionable
- Lockable door latch with lever action
- Insulated door with optimum sealing performance
- one insert grille included in delivery



TS 50-100 //logg

Features series TUS:

- Large interior space with small external dimensions due to vacuum insulation (VIP)
- Extremely quiet refrigeration unit
- Microprocessor-controlled regulation with membrane keypad (Standard)
- Touchscreen control with colour display and integrated data logger for full traceability (//logg)
- Maximum safety due to mains-independent alarm with rechargeable battery for approx. 72 hours
- Various interfaces
- Interior made of high-quality stainless steel
- Cable gland (diameter 19mm)
- Insertion grille (stainless steel) variably positionable
- Lockable door latch with lever action
- Insulated door with optimum sealing performance
- one insert grille included in delivery



TUS 80-100 //logg

Options:

- Mobile version for TS series
- Recirculation fan for even temperature distribution throughout the interior

Technical data TS-series:

| | TS 50-100 | TS 50-100 //logg | TS 80-100 | TS 80-100// logg |
|-------------------------------------|-----------|---------------------|-----------|---------------------|
| Performance Data Temperature | | | | |
| Controller | Standard | //logg | Standard | //logg |
| Temperature range [°C] | -10...-50 | -10...-50 | -50...-80 | -50...-80 |
| Control accuracy [± K] | 1 | 1 | 1 | 1 |
| Ambient temperature [° C] | +12...+30 | +12...+30 | +12...+30 | +12...+30 |
| Electrical data | | | | |
| Rated Voltage [V] | 230 | 230 | 230 | 230 |
| Power frequency (±10%) [Hz] | 50 | 50 | 50 | 50 |
| Outer dimensions | | | | |
| Width net [mm] | 680 | 680 | 680 | 680 |
| Height net [mm] | 1160 | 1160 | 1160 | 1160 |
| Depth net [mm] | 730 | 730 | 730 | 730 |
| Wall clearance back [mm] | 160 | 160 | 160 | 160 |
| Wall clearance sidewise [mm] | 100 | 100 | 100 | 100 |
| Internal Dimensions | | | | |
| Width [mm] | 450 | 450 | 450 | 450 |
| Height [mm] | 500 | 500 | 500 | 500 |
| Depth [mm] | 450 | 450 | 450 | 450 |
| Interior volume [L] | 100 | 100 | 100 | 100 |
| Net weight of the unit (empty) [kg] | 120 | 120 | 120 | 120 |

Technical data TUS-series:

| | TUS 50-100 | TUS 50- 100//logg | TUS 80-100 | TUS 80-100 //logg |
|-------------------------------------|------------|----------------------|------------|----------------------|
| Performance Data Temperature | | | | |
| Controller | Standard | //logg | Standard | //logg |
| Temperature range [°C] | -10...-50 | -10...-50 | -50...-80 | -50...-80 |
| Control accuracy [± K] | 1 | 1 | 1 | 1 |
| Ambient temperature [° C] | +12...+30 | +12...+30 | +12...+30 | +12...+30 |
| Electrical data | | | | |
| Rated Voltage [V] | 230 | 230 | 230 | 230 |
| Power frequency (±10%) [Hz] | 50 | 50 | 50 | 50 |
| Outer dimensions | | | | |
| Width net [mm] | 950 | 950 | 950 | 950 |
| Height net [mm] | 750 | 750 | 750 | 750 |
| Depth net [mm] | 730 | 730 | 730 | 730 |
| Wall clearance back [mm] | 160 | 160 | 160 | 160 |
| Wall clearance sidewise [mm] | 100 | 100 | 100 | 100 |
| Internal Dimensions | | | | |
| Width [mm] | 450 | 450 | 450 | 450 |
| Height [mm] | 500 | 500 | 500 | 500 |
| Depth [mm] | 450 | 450 | 450 | 450 |
| Interior volume [L] | 100 | 100 | 100 | 100 |
| Net weight of the unit (empty) [kg] | 120 | 120 | 120 | 120 |

❖ COLD BOXES

B series: Cold boxes

The cold- and freezing box B 30-20 as well as the series B are desk-freezer units and can be placed directly at the workplace.

The type B 30-20 is stackable. Up to three units can be stacked on top of each other.

The version B 30-20 (-20°C/30 liters) is equipped with a thermo pane window in the door that enables the observation of frozen materials. All casing parts are made from stainless steel.

The cold box B 30 is fitted with a quiet, hermetically sealed cooling compressor. The intrinsically safe, aircooled refrigeration system is maintenance-free.

The cold boxes series B3 are small desktop devices for cooling and freezing and therefore suitable for the use in laboratories as well as in research and industry facilities. It is suitable for the use directly at the workplace, especially because of its compact and space saving design and a low noise cooling aggregate.

Features:

Type B 30-20:

- The model B 30-20 is equipped with a digital two-point control with PT 100 sensortemperature display
- Stainless steel housing
- Blue protective ring around top and bottom to avoid risk of injury
- Large window in the door
- Cable gland (10 mm)

B 35 series:

- B 35 - unit types are equipped with a control unit with membrane keypad and integrated, galvan. isolated, mains-independent alarm (visual and acoustic signal, alarm contact for connection to an external alarm signal / temperature recorder output 10mV/K for connection of a temperature recording system / RS485 interface
- //logg variant with electronic programme controller, touch screen operation and internal data logger
- Stainless steel housing
- Foamed door with double door sealing
- Vacuum insulation - better insulation, therefore less power consumption
- Ventilation grid on the left and right side - the box can be placed directly to a wall
- Cable gland (10 mm)
- Lockable door



B 30-20



B 35-50 //logg

Options:

- Recirculation fan for even temperature distribution throughout the interior

Technical data B30-20:

| | | B 30-20 |
|-------------------------------------|--|-----------|
| Performance Data Temperature | | |
| Temperature range [°C] | | +10...-20 |
| Control accuracy [± K] | | 1 |
| Ambient temperature [° C] | | +12...+30 |
| Electrical data | | |
| Rated Voltage [V] | | 230 |
| Power frequency (±10%) [Hz] | | 50 |
| Outer dimensions | | |
| Width net [mm] | | 530 |
| Height net [mm] | | 460 |
| Depth net [mm] | | 700 |
| Internal Dimensions | | |
| Width [mm] | | 360 |
| Height [mm] | | 230 |
| Depth [mm] | | 350 |
| Interior volume [L] | | 30 |
| Net weight of the unit (empty) [kg] | | 42 |

Technical data B35-50/-85:

| | B 35-50 | B 35-50 //logg | B 35-85 | B 35-85 //logg |
|-------------------------------------|-----------|----------------|-----------|----------------|
| Performance Data Temperature | | | | |
| Controller | Standard | //logg | Standard | //logg |
| Temperature range [°C] | -10...-50 | -10...-50 | -50...-85 | -50...-85 |
| Control accuracy [± K] | 1 | 1 | 1 | 1 |
| Ambient temperature [° C] | +12...+30 | +12...+30 | +12...+30 | +12...+30 |
| Electrical data | | | | |
| Rated Voltage [V] | 230 | 230 | 230 | 230 |
| Power frequency (±10%) [Hz] | 50 | 50 | 50 | 50 |
| Outer dimensions | | | | |
| Width net [mm] | 580 | 580 | 580 | 580 |
| Height net [mm] | 540 | 540 | 540 | 540 |
| Depth net [mm] | 765 | 765 | 765 | 765 |
| Internal Dimensions | | | | |
| Width [mm] | 425 | 425 | 425 | 425 |
| Height [mm] | 280 | 280 | 280 | 280 |
| Depth [mm] | 300 | 300 | 300 | 300 |
| Interior volume [L] | 35 | 35 | 35 | 35 |
| Net weight of the unit (empty) [kg] | 65 | 65 | 81 | 81 |

◆ VACUUM DRYING OVENS

Series VD: Vacuum drying chambers for non-flammable solvents

A vacuum drying oven VD series gently dries materials with homogeneous temperature distribution. The patented expansion shelf technology ensures optimal heat transfer. The shelves are easy to position where required and the inner chamber of the vacuum drying oven is easy to clean.

● **Features:**

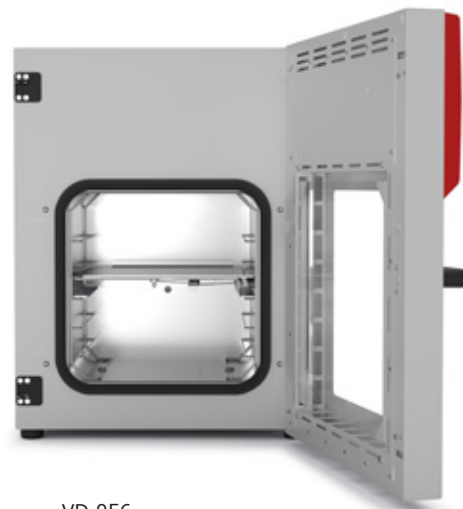
- Temperature range: room temperature +9 °C to 220 °C
- Controller with digital display of pressure and temperature
- Program-controlled drying monitoring with automatic ventilation at end of process
- Internal data logger, measured values can be read out in open format via USB
- 1 aluminum expansion rack, can be custom-positioned
- Inert gas connection
- Universal access port DN 16
- Shatterproof, spring-mounted safety glass panel
- Large viewing window with option of interior lighting
- Computer interface: Ethernet
- 2 relay outputs, 24 V DC (max. 0.4 A)

Optional equipment:

- Touchscreen Controller - Graphical display of main process parameter
- Expansion racks - Choice of aluminum or stainless steel racks depending on the application requirements
- Analogue output for temperature and pressure signals - for external monitoring and evaluation of the process parameters, integration into in-house systems is possible
- Universal ventilation - Selection of different ventilation by air or inert gas
- Universal access port DN 40
- Multi Management Software APT-COM - Manage, record and document device parameters



VD 056



VD 056

Technical data:

| | VD023 | VD056 | VD115 |
|---|-----------|-----------|-----------|
| | 230V * | 230V * | 230V * |
| Article Number | 9630-001 | 9630-0002 | 9630-0003 |
| Performance Data Temperature | | | |
| Temperature range 9 °C above ambient temperature to [°C] | 220 | 220 | 220 |
| Temperature variation at 100 °C [± K] | 1,0 | 1,2 | 2,9 |
| Temperature fluctuation [± K] | 0,1 | 0,1 | 0,1 |
| Heating-up time to 100 °C [min] | 80 | 80 | 130 |
| Vacuum Data | | | |
| Leak rate [bar/h] | 0,01 | 0,01 | 0,01 |
| Electrical data | | | |
| Rated Voltage [V] | 200...230 | 200...230 | 200...230 |
| Power frequency [Hz] | 50/60 | 50/60 | 50/60 |
| Nominal power [kW] | 0,9 | 1,4 | 1,6 |
| Unit fuse [A] | 6,3 | 8 | 10 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ | 1~ |
| Connections | | | |
| Compressed air connection for pressure-encapsulation [NW] | 5 | 5 | 5 |
| Vacuum connection with small flange [DN mm] | 16 | 16 | 16 |
| Measuring access port with small flange [DN mm] | 16 | 16 | 16 |
| Inert gas connection with flow limiter (RP") | 3/8 | 3/8 | 3/8 |
| Outer dimensions | | | |
| Width net [mm] | 523 | 638 | 743 |
| Height net [mm] | 698 | 815 | 942 |
| Depth net [mm] | 413 | 461 | 581 |
| Wall clearance back [mm] | 100 | 100 | 100 |
| Wall clearance sidewise [mm] | 70 | 70 | 70 |
| Viewing window width [mm] | 305 | 420 | 525 |
| Viewing window height [mm] | 305 | 420 | 468 |
| Doors | | | |
| Unit doors | 1 | 1 | 1 |
| Internal Dimensions | | | |
| Width [mm] | 285 | 400 | 506 |
| Height [mm] | 285 | 400 | 506 |
| Depth [mm] | 295 | 343 | 460 |
| Further Dimension | | | |
| Interior volume [L] | 24 | 55 | 119 |
| Net weight of the unit (empty) [kg] | 64 | 95 | 146 |
| permitted load [kg] | 50 | 60 | 70 |
| Load per rack [kg] | 20 | 20 | 20 |
| Fixtures | | | |
| Number of shelves (std./max.) | 1/4 | 1/5 | 1/6 |

* 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.

Series VDL: Vacuum drying chambers for flammable solvents

A safety vacuum drying oven of the VDL series ensures maximum safety when drying organic solvents standard with TÜV/GS. The inner chamber of the VDL safety vacuum drying oven is designed according to ATEX guidelines 2014/34/EU: EX II 2/3/- G IIB T3 Gb/Gc/- X.

Features:

- Temperature range: room temperature plus 9 °C to 110 °C
- ATEX compliance chamber's interior: EX II 2/3/- G IIB T3 Gb/Gc/- X
- Intuitive touchscreen controller with graphical pressure and temperature display
- Program-controlled drying monitoring with automatic ventilation at end of process
- Internal data logger, measured values can be readout in open format via USB
- Pressure control device for heating activated from < 100 mbar
- 2 aluminum expansion racks, can be custom-positioned
- Universal connection for ventilation with ambient air or inert gas
- Universal access port DN 16
- Shatterproof, spring-mounted safety glass panel
- Large viewing window
- Computer interface: Ethernet

Optional equipment:

- Expansion racks - Choice of aluminum or stainless steel racks depending on the application requirements
- Analogue output for temperature and pressure signals - for external monitoring and evaluation of the process parameters, integration into in-house systems is possible
- Universal ventilation - Selection of different ventilation by air or inert gas
- Universal access port DN 40
- Multi Management Software APT-COM - Manage, record and document device parameters



VDL 056



VDL 056 w/m Module

Technical data:

| | VDL023 | VDL056 | VDL115 |
|--|-----------|-----------|-----------|
| | 230V * | 230V * | 230V * |
| Article Number | 9630-0009 | 9630-0010 | 9630-0011 |
| Performance Data Temperature | | | |
| Temperature range 9 °C above ambient temperature to [°C] | 110 | 110 | 110 |
| Temperature variation at 100 °C [± K] | 1,0 | 1,2 | 2,9 |
| Temperature fluctuation [± K] | 0,1 | 0,1 | 0,1 |
| Heating-up time to 100 °C [min] | 110 | 140 | 170 |
| Vacuum Data | | | |
| Leak rate [bar/h] | 0,01 | 0,01 | 0,01 |
| Electrical data | | | |
| Rated Voltage [V] | 200...230 | 200...230 | 200...230 |
| Power frequency [Hz] | 50/60 | 50/60 | 50/60 |
| Nominal power [kW] | 0,9 | 1,4 | 1,6 |
| Unit fuse [A] | 6,3 | 8 | 10 |
| Phase (Nominal voltage) [ph] | 1~ | 1~ | 1~ |
| Connections | | | |
| Vacuum connection with small flange [DN mm] | 16 | 16 | 16 |
| Measuring access port with small flange [DN mm] | 16 | 16 | 16 |
| Inert gas connection with flow limiter (RP") | 3/8 | 3/8 | 3/8 |
| Outer dimensions | | | |
| Width net [mm] | 523 | 638 | 743 |
| Height net [mm] | 698 | 815 | 942 |
| Depth net [mm] | 413 | 461 | 581 |
| Wall clearance back [mm] | 100 | 100 | 100 |
| Wall clearance sidewise [mm] | 70 | 70 | 70 |
| Viewing window width [mm] | 305 | 420 | 525 |
| Viewing window height [mm] | 305 | 420 | 468 |
| Doors | | | |
| Unit doors | 1 | 1 | 1 |
| Internal Dimensions | | | |
| Width [mm] | 285 | 400 | 506 |
| Height [mm] | 285 | 400 | 506 |
| Depth [mm] | 295 | 343 | 460 |
| Further Dimension | | | |
| Interior volume [L] | 24 | 55 | 119 |
| Net weight of the unit (empty) [kg] | 72 | 104 | 158 |
| Permitted load [kg] | 50 | 60 | 70 |
| Load per rack [kg] | 20 | 20 | 20 |
| Fixtures | | | |
| Number of shelves (std./max.) | 2/4 | 2/5 | 2/6 |

* 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.

ASHING FURNACES

LV (LVT) Series: Highly reliable ashing furnaces

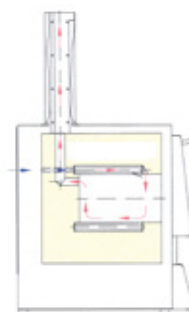
Ashing furnace LV .. /11 is designed especially for ashing processes to 1050°C in the laboratory. Applications include determining loss on ignition, ashing plastics for subsequent substance analysis. A special fresh-air and exhaust air system ensures that the air is replaced 6 times per minute so that there is always sufficient oxygen for the ashing process. Incoming air passes the furnace heating and is pre-heated to ensure good temperature uniformity.

Features:

- Tmax 1100 °C
- Heating from two sides
- Ceramic heating plates with integral heating element which is safeguarded, and easy to replace
- Air exchange of more than 6 times per minute
- Good temperature uniformity due to preheating of incoming air, temperature uniformity according to DIN 17052-1 to +/- 10 °C in the defined empty work area (from 550 °C)
- Dual shell housing made of textured stainless steel sheets with additional fan cooling for low surface temperature
- Exclusive use of insulation materials without categorization according to EC Regulation No. 1272/2008 (CLP)
- Suitable for many standardized ashing processes according to ISO, ASTM, EN, and DIN
- Optional flap door (LV) which can be used as work platform or lift door (LVT) with hot surface facing away from the operator
- Controller B510 (5 programs with each 4 segments)
- Solid state relays provide for lownoise operation
- NTLog Basic for Nabertherm controller: recording of process data with USB-flash drive



LVT 9-11



Technical data:

| | LV (LVT) 3-11 | LV (LVT) 5-11 | LV (LVT) 9-11 |
|--|-----------------------|-----------------------|-----------------------|
| Tmax [° C] | 1100 | 1100 | 1100 |
| Nominal Power [kW] | 1.2 | 2.4 | 3.0 |
| El. connection, single phase / three-phase | 1 N~ | 1 N~ | 1 N~ |
| Mains voltage / mains frequency [V , Hz] | 110 ... 240 / 50...60 | 110 ... 240 / 50...60 | 110 ... 240 / 50...60 |
| Weight [kg] | 20 | 35 | 45 |
| Dimensions / inside | | | |
| Width [mm] | 160 | 200 | 230 |
| Depth [mm] | 140 | 170 | 240 |
| Height [mm] | 100 | 130 | 170 |
| Volume [l] | 3 | 5 | 9 |
| Dimensions / outside | | | |
| Width [mm] | 385 | 385 | 415 |
| Depth [mm] | 360 | 420 | 485 |
| Height incl. duct (Ø 80 mm) [mm] | 735 | 790 | 845 |

Option: Temperature safety device, class 2

MUFFLE FURNACE

L (LT) Series: Highly reliable muffle furnaces

The muffle furnaces series L / LT have been proven for daily laboratory use. These models stand out for their excellent workmanship, advanced and attractive design, and high level of reliability. The muffle furnaces come equipped with either a flap door or lift door at no extra charge.

Features:

- Tmax 1100°C or 1200°C
- Heating from two sides by ceramic heating plates for an optimal temperature uniformity
- Temperature uniformity of ± 5 K with closed fresh-air inlet in empty work space according to DIN 17052-1 at working temperatures above 800°C
- Thermocouple type N (1100°C) or type S (1200°C)
- Ceramic heating plates with integral heating element which is safeguarded and easy to replace
- Optional flap door (L) which can be used as work platform or lift door (LT) with hot surface facing away from the operator
- Dual shell housing made of textured stainless steel sheets with additional fan cooling for low surface temperature
- Exclusive use of insulation materials without categorization according to EC Regulation No. 1272/2008 (CLP)
- Adjustable air inlet integrated in door
- Exhaust air outlet in rear wall of furnace
- Controller B510 (5 programs with each 4 segments)
- Solid state relays provide for lownoise operation
- NTLog Basic for controller: recording of process data with USB-flash drive



L 3-11



Technical data:

| | L (LT) 3-11 / 3-12 | L (LT) 5-11 / 5-12 | L (LT) 9-11 / 9-12 |
|---|-----------------------|-----------------------|-----------------------|
| Tmax [° C] | 1100 / 1200 | 1100 / 1200 | 1100 / 1200 |
| Nominal Power [kW] | 1.2 | 2.4 | 3.0 |
| El. connection, single phase / three-phase | 1 N~ | 1 N~ | 1 N~ |
| Mains voltage / mains frequency [V , Hz] | 110 ... 240 / 50...60 | 110 ... 240 / 50...60 | 110 ... 240 / 50...60 |
| Weight [kg] | 20 | 30 | 35 |
| Dimensions / inside | | | |
| Width [mm] | 160 | 200 | 230 |
| Depth [mm] | 140 | 170 | 240 |
| Height [mm] | 100 | 130 | 170 |
| Volume [l] | 3 | 5 | 9 |
| Dimensions / outside | | | |
| Width [mm] | 385 | 385 | 415 |
| Depth [mm] | 330 | 390 | 455 |
| Height / Height with lift door open (LT variant) [mm] | 405 / 560 | 460 / 665 | 515 / 755 |

PRECISION BALANCES

Series 440: The classic balance in the laboratory

Features:

- Compact size, practical for small spaces
- Percentage determination: makes it possible to store a given weight value (100 %) and to determine deviations from this target value
- Ring-shaped draught shield standard, only for models with weighing plate size „A“, weighing space Ø×H 90×40 mm
- Protective working cover included with delivery



Optional



Technical data:

| | 440-21A | 440-33N | 440-35N | 440-35A | 440-43N | 440-45N | 440-47N | 440-49N | 440-49A | 440-51N | 440-53N |
|----------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Measuring system | | | | | | | | | | | |
| Weighing range [Max] [g] | 60 | 200 | 400 | 600 | 400 | 1000 | 2000 | 4000 | 6000 | 4000 | 6000 |
| Readout [g] | 0,001 | 0,01 | 0,01 | 0,01 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 1 | 1 |
| Reproducibility [g] | 0,001 | 0,01 | 0,01 | 0,01 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 1 | 1 |
| Linearity [g] | ±0,003 | ±0,02 | ±0,03 | ±0,03 | ±0,2 | ±0,2 | ±0,2 | ±0,2 | ±0,3 | ±0,3 | ±2 |
| Calibration / Adjusting | externally | externally | externally | externally | externally | externally | externally | externally | externally | externally | externally |
| DAkkS Certificate (option) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Verification value [mg] | - | - | - | - | - | - | - | - | - | - | - |
| Data Interface | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 |
| Pan, stainless steel [mm] | Ø 81 | Ø 105 | Ø 105 | Ø 105 | 130x130 | 130x130 | 130x130 | 150x170 | 150x170 | 150x170 | 150x170 |
| Electrial data | | | | | | | | | | | |
| Input voltage [V] AC | 100 - 240 | 100 - 240 | 100 - 240 | 100 - 240 | 100 - 240 | 100 - 240 | 100 - 240 | 100 - 240 | 100 - 240 | 100 - 240 | 100 - 240 |
| Dimensions | | | | | | | | | | | |
| Width [mm] | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 |
| Height [mm] | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| Depth [mm] | 230 | 230 | 230 | 230 | 230 | 230 | 230 | 230 | 230 | 230 | 230 |
| Weight [kg], approx. | 0,95 | 0,95 | 0,95 | 0,95 | 0,95 | 0,95 | 0,95 | 0,95 | 0,95 | 0,95 | 0,95 |

Series PFB: Precision balance

Quick-display precision balance with user-friendly concept of operation

Features:

- Easy to use: All primary functions have their own key on the keypad
- Compact size, practical for small spaces
- Capacity display: A bar lights up to show how much of the weighing range is still available
- Level indicator and levelling feet for precise levelling of the scale, fitted as standard, to give the most accurate weighing result
- Draught shield standard (only for models with weighing plate size mm Ø 80 and 120). Weighing space W×D×H 158×143×64 mm
- Protective working cover included with delivery



Factory

Optional



Technical data:

| | PFB 120-3 | PFB 200-3 | PFB 300-3 | PFB 600-2 | PFB 1200-2 | PFB 2000-2 | PFB 3000-2 | PFB 6000-2 | PFB 6000- |
|------------------------------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|-----------|
| Measuring system | | | | | | | | | |
| Weighing range [Max] [g] | 120 | 200 | 300 | 600 | 1200 | 2000 | 3000 | 6000 | 6000 |
| Readout [g] | 0,001 | 0,001 | 0,001 | 0,01 | 0,01 | 0,01 | 0,01 | 0,05 | 0,1 |
| Reproducibility [mg] | 1 | 2 | 2 | 10 | 10 | 20 | 20 | 50 | 100 |
| Linearity [g] | ±0,003 | ±0,005 | ±0,005 | ±0,03 | ±0,03 | ±0,05 | ±0,05 | ±0,15 | ±0,3 |
| Calibration / Adjusting | external | external | external | external | external | external | external | external | extern |
| DAkkS Certificate (Optional) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Verification value [mg] | - | - | - | - | - | - | - | - | - |
| Data Interface | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 |
| Pan, stainless steel [mm] | Ø 80 | Ø 80 | Ø 80 | Ø 120 | Ø 120 | Ø 120 | Ø 120 | 190 x 180 | 190 x 180 |
| Electrical data | | | | | | | | | |
| Input voltage [V] AC | 100 - 240 | 100 - 240 | 100 - 240 | 100 - 240 | 100 - 240 | 100 - 240 | 100 - 240 | 100 - 240 | 100 - 240 |
| Dimensions | | | | | | | | | |
| Width [mm] | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 |
| Height [mm] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Depth [mm] | 315 | 315 | 315 | 315 | 315 | 315 | 315 | 315 | 315 |
| Weight [kg] | aprox. 2 | aprox. 2 | aprox. 2 | aprox. 2 | aprox. 2 | aprox. 2 | aprox. 2 | aprox. 2 | aprox. 2 |

Series 572: All-rounder as precision balance in the laboratory

Features:

- Thanks to the many typical laboratory functions, such as, for example, recipe function, percentage determination, combined with the high level of precision, the 572 is a reliable partner for day-to-day work in the laboratory
- The robust version, typical industrial functions, such as piece-counting and vibration-free weighing also make these balances ideal for all industrial applications, where a high level of precision is required
- The robust aluminium cast housing maintains the stability, protects the weighing technology elements and is robust enough to cope with everyday use
- Ring-shaped draft shield standard for models with weighing plate size Ø 106 mm. Weighing space Ø×H 157×43 mm
- Loop and hook for underfloor weighing standard on all models with readout [d] < 1 g
- Protective working cover included with delivery
- Models with a resolution > 240,000 points: Level indicator to level the balance precisely



Standard



Optional



Technical data:

| | 572-30 | 572-31 | 572-32 | 572-33 | 572-35 | 572-37 | 572-39 | 572-45 | 572-55 | 572-57 |
|----------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Measuring system | | | | | | | | | | |
| Weighing range [Max] [g] | 240 | 300 | 420 | 1600 | 2400 | 3000 | 4200 | 12000 | 20000 | 24000 |
| Readout [g] | 0,001 | 0,001 | 0,001 | 0,01 | 0,01 | 0,01 | 0,01 | 0,05 | 0,05 | 0,1 |
| Reproducibility [mg] | 1 | 2 | 2 | 10 | 10 | 20 | 20 | 50 | 100 | 100 |
| Linearity [g] | ±0,003 | ±0,005 | ±0,005 | ±0,03 | ±0,03 | ±0,05 | ±0,05 | ±0,15 | ±0,25 | ±0,3 |
| Calibration / Adjusting | externally | externally | externally | externally | externally | externally | externally | externally | externally | externally |
| DAkKS Certificate (Option) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Verification value [mg] | - | - | - | - | - | - | - | - | - | - |
| Data Interface | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 |
| Pan, stainless steel [mm] | Ø 106 | Ø 106 | Ø 106 | Ø 150 | Ø 150 | Ø 150 | Ø 150 | 160 x 200 | 160 x 200 | 160 x 200 |
| Electrical data | | | | | | | | | | |
| Input voltage [V] AC | 110 - 230 | 110 - 230 | 110 - 230 | 110 - 230 | 110 - 230 | 110 - 230 | 110 - 230 | 110 - 230 | 110 - 230 | 110 - 230 |
| Dimensions | | | | | | | | | | |
| Width [mm] | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 |
| Height [mm] | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 |
| Depth [mm] | 310 | 310 | 310 | 310 | 310 | 310 | 310 | 310 | 310 | 310 |
| Weight [kg] | appr. 2,4 | appr. 2,4 | appr. 2,4 | appr. 2,4 | appr. 2,4 | appr. 2,4 | appr. 2,4 | appr. 2,8 | appr. 2,8 | appr. 2,8 |

Series EW-N: The classic balance with robust tuning fork measuring system

Features:

- Internal adjustment circuit via rotary knob on the side guarantees high accuracy and makes independent of location
- „CAL EXT“ only EW-NM: Adjusting program CAL for quick setting of the balance accuracy using an external test weight
- Stable temperature behaviour
- Short stabilisation time
- Shock proof construction
- High corner load performance
- Capacity display: A bar lights up to show how much of the weighing range is still available
- GLP/ISO record keeping of weight values
- Totalising of pieces when counting
- Draught shield standard for models with weighing plate size Ø 118 mm, weighing space W×D×H 158×130×78 mm
- Protective working cover included with delivery



Standard



Optional



Factory



Technical data:

| | EW 220-3NM | EW 420-3NM | EW 620-3NM | EW 820-2NM | EW 2200-2NM | EW 4200-2NM | EW 6200-2NM | EW 12000-1NM |
|----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| Measuring system | | | | | | | | |
| Weighing range [Max] [g] | 220 | 420 | 620 | 820 | 2200 | 4200 | 6200 | 12000 |
| Readout [g] | 0,001 | 0,001 | 0,001 | 0,01 | 0,01 | 0,01 | 0,01 | 0,1 |
| Reproducibility [mg] | 1 | 1 | 1 | 10 | 10 | 10 | 10 | 100 |
| Linearity [g] | ±0,002 | ±0,003 | ±0,003 | ±0,01 | ±0,01 | ±0,02 | ±0,03 | ±0,2 |
| Calibration / Adjusting | externally | externally | externally | externally | externally | externally | externally | externally |
| DAkkS Certificate (Option) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Verification value [mg] | - | - | - | - | - | - | - | - |
| Data Interface | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 |
| Pan, stainless steel [mm] | Ø 118 | Ø 118 | Ø 118 | 170x140 | 180x160 | 180x160 | 180x160 | 180x160 |
| Electrical data | | | | | | | | |
| Input voltage [V] AC | 220 - 240 | 220 - 240 | 220 - 240 | 220 - 240 | 220 - 240 | 220 - 240 | 220 - 240 | 220 - 240 |
| Dimensions | | | | | | | | |
| Width [mm] | 182 | 182 | 182 | 182 | 192 | 192 | 192 | 192 |
| Height [mm] | 75 | 75 | 75 | 75 | 87 | 87 | 87 | 87 |
| Depth [mm] | 235 | 235 | 235 | 235 | 275 | 275 | 275 | 275 |
| Weight [kg] | approx. 1,4 | approx. 1,4 | approx. 1,4 | approx. 1,4 | approx. 1,4 | approx. 1,4 | approx. 1,4 | approx. 1,4 |

ANALYTICAL BALANCES

Series ALS-A/ALJ-A: Range of analytical balances, with large weighing ranges, intuitive graphics display, also with EC type approval [M]

Features:

- Rapid and efficient operation thanks to the graphic display. Simple plain text user guidance in the display, following languages available: DE, EN, FR, IT, ES, PT
- ALJ-A03: Ioniser to neutralise electrostatic charge for fixed installation in the analytical balance.
- Adjusting program CAL for quick setting of the balance accuracy, external test weights at an additional price
- Short stabilisation time: Steady weight values within approx. 4 sec under laboratory conditions (on all models with readout [d] = 0,1 mg), 10 | 6 s (on all models with readout [d] = 0,01 mg)
- Weighing with tolerance range (checkweighing): Input of an upper/lower limit value.
- Internal memory for complete recipes with name and target value of therecipe ingredients.
- Large glass draught shield with 3 sliding doors for easy access to the items being weighed
- Protective working cover included with delivery



Technical data:

| | ALS 160-4A | ALS 250-4A | ALJ 160-4A | ALJ 160-4AM | ALJ 250-4A | ALJ 250-4AM |
|----------------------------|------------|------------|------------|-------------|------------|-------------|
| Measuring system | | | | | | |
| Weighing range [Max] [g] | 160 | 250 | 160 | 160 | 250 | 250 |
| Readout [mg] | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Reproducibility [mg] | 0,1 | 0,1 | 0,1 | 0,2 | 0,1 | 0,2 |
| Linearity [mg] | ±0,3 | ±0,3 | ±0,3 | ±0,3 | ±0,3 | ±0,3 |
| Calibration / Adjusting | externally | externally | internally | internally | internally | internally |
| DAkKS Certificate (Option) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Verification value [mg] | - | - | - | 1 | - | 1 |
| Set density determination | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Data Interface | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 |
| Pan, stainless steel [mm] | Ø 80 | Ø 80 | Ø 80 | Ø 80 | Ø 80 | Ø 80 |
| Electrial data | | | | | | |
| Input voltage [V] AC | 110 - 230 | 110 - 230 | 110 - 230 | 110 - 230 | 110 - 230 | 110 - 230 |
| Dimensions | | | | | | |
| Width [mm] | 210 | 210 | 210 | 210 | 210 | 210 |
| Height [mm] | 330 | 330 | 330 | 330 | 330 | 330 |
| Depth [mm] | 340 | 340 | 340 | 340 | 340 | 340 |
| Weight [kg] | 7 | 7 | 7 | 7 | 7 | 7 |

Other versions on request!

Series ABT: The premium model with single-cell weighing system

Features:

- Automatic internal adjustment in the case of a change in temperature > 0,5 °C and time-controlled every 4 hours
- Simple recipe weighing and documenting with a combined tare/print function.
- Identification number: 4 digits, printed on calibration protocol freely programmable
- Automatic data output to the PC/printer each time the balance is steady

Single-cell advanced technology:

- Fully automatic manufactured weighing cell from one piece of material
- Stable temperature behaviour
- Short stabilisation time: Steady weight values within approx. 5 sec under laboratory conditions
- Shock proof construction
- High corner load performance



Technical data:

| | ABT 120-4NM | ABT 220-4NM | ABT 320-4NM | ABT 100-5NM |
|---------------------------|-------------|-------------|-------------|-------------|
| Measuring system | | | | |
| Weighing range [Max] [g] | 120 | 220 | 320 | 101 |
| Readout [mg] | 0,1 | 0,1 | 0,1 | 0,01 |
| Reproducibility [mg] | 0,1 | 0,1 | 0,1 | 0,05 |
| Linearity [mg] | ±0,2 | ±0,2 | ±0,3 | ±0,15 |
| Calibration / Adjusting | internally | internally | internally | internally |
| DAkkS Certificate | ✓ | ✓ | ✓ | ✓ |
| Verification value [mg] | 1 | 1 | 1 | 1 |
| Set density determination | ✓ | ✓ | ✓ | ✓ |
| Data Interface | RS 232 | RS 232 | RS 232 | RS 232 |
| Pan, stainless steel [mm] | Ø 80 | Ø 80 | Ø 80 | Ø 80 |
| Electrical data | | | | |
| Input voltage [V] AC | 110 - 230 | 110 - 230 | 110 - 230 | 110 - 230 |
| Dimensions | | | | |
| Width [mm] | 217 | 217 | 217 | 217 |
| Height [mm] | 338 | 338 | 338 | 338 |
| Depth [mm] | 356 | 356 | 356 | 356 |
| Weight [kg] | approx. 7 | approx. 7 | approx. 7 | approx. 7 |

Other versions on request!

Series ADB/ADJ: The price leader in analytical balances - now also with internal adjustment

Features:

- ADJ: Automatic internal adjustment in the case of a change in temperature ≥ 2 °C or timecontrolled every 3 h, guarantees high degree of accuracy and makes the balance independent of its location of use
- ADB: Adjusting program CAL for quick setting of the balance accuracy, external test weights at an additional price
- Adjusting program CAL for quick setting of the balance accuracy using an external test weight
- Level indicator and levelling feet for precise levelling of the scale, fitted as standard, to give the most accurate weighing result
- Large glass draught shield with 3 sliding doors for easy access to the items being weighed
- Compact size, practical for small spaces
- Simple and convenient 6-key operation



Technical data:

| | ADB 100-4 | ADB 200-4 | ADB 600-C3 | ADJ 100-4 | ADJ 200-4 | ADJ 600-C3 |
|----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Measuring system | | | | | | |
| Weighing range [Max] [g] | 120 | 210 | 120 | 120 | 210 | 120 |
| Readout [mg] | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Reproducibility [mg] | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 |
| Linearity [mg] | $\pm 0,4$ | $\pm 0,4$ | $\pm 0,4$ | $\pm 0,4$ | $\pm 0,4$ | $\pm 0,4$ |
| Calibration / Adjusting | externally | externally | externally | internally | internally | internally |
| DAkkS Certificate (Option) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Verification value [mg] | - | - | - | - | - | - |
| Data Interface | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 | RS 232 |
| Pan, stainless steel [mm] | $\varnothing 90$ | $\varnothing 90$ | $\varnothing 90$ | $\varnothing 90$ | $\varnothing 90$ | $\varnothing 90$ |
| Electrical data | | | | | | |
| Input voltage [V] AC | 100 - 240 | 100 - 240 | 100 - 240 | 100 - 240 | 100 - 240 | 100 - 240 |
| Dimensions | | | | | | |
| Width [mm] | 230 | 230 | 230 | 230 | 230 | 230 |
| Height [mm] | 330 | 330 | 210 | 330 | 330 | 210 |
| Depth [mm] | 310 | 310 | 310 | 310 | 310 | 310 |
| Weight [kg] | 4,4 | 4,4 | 3,8 | 5 | 5 | 4,5 |

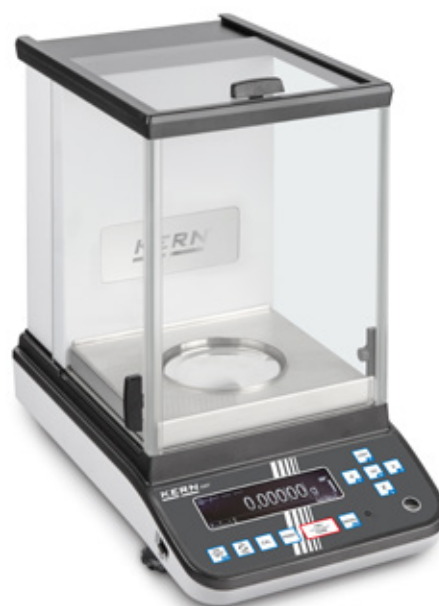
Series ABP: Premium analytical balance with the latest Single-Cell Generation for extremely rapid, stable weighing results

Features:

- Bright OLED display with wide viewing angle stability
- RS-232 and USB data interfaces
- GLP/ISO logging
- Internal automatic adjustment for temperature changes > 1 °C and time-controlled every 4 h
- U.S. FDA 21 Part 11: Supports data integrity according to U.S. FDA 21 Part 11
- Menu language DE, GB
- Automatic data output to PC/printer after each scale stop
- Large glass draft shield with 3 sliding doors
- Dust cover included in delivery

Single-cell advanced technology:

- Fully automatic manufactured weighing cell from one piece of material
- Stable temperature behaviour
- Short stabilisation time: Steady weight values within a few seconds under laboratory conditions
- Shock proof construction
- High corner load performance



Technical data:

| | ABP 100-5M | ABP 200-5M | ABP 100-4M | ABP 200-4M | ABP 300-4M | ABP 100-5DM | ABP 200-5DM |
|----------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Measuring system | | | | | | | |
| Weighing range [Max] [g] | 135 | 220 | 120 | 220 | 320 | 52 / 120 | 102 / 220 |
| Readout [mg] | 0,01 | 0,01 | 0,1 | 0,1 | 0,1 | 0,01 / 0,1 | 0,01 / 0,1 |
| Reproducibility [mg] | 0,05 | 0,015...0,05 | 0,1 | 0,1 | 0,2 | 0,02 / 0,1 | 0,05 / 0,1 |
| Linearity [mg] | ±0,2 | ±0,2 | ±0,2 | ±0,2 | ±0,3 | ±0,05 / 0,2 | ±0,1 / 0,2 |
| Calibration / Adjusting | internally | internally | internally | internally | internally | internally | internally |
| DAkkS Certificate (Option) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Verification value [mg] | 1 | 1 | 1 | 1 | 1 | 1 / 1 | 1 / 1 |
| Data Interface | RS 232 / USB | RS 232 / USB | RS 232 / USB | RS 232 / USB | RS 232 / USB | RS 232 / USB | RS 232 / USB |
| Pan, stainless steel [mm] | Ø 91 | Ø 91 | Ø 91 | Ø 91 | Ø 91 | Ø 91 | Ø 91 |
| Electrical data | | | | | | | |
| Input voltage [V] AC | 220 - 240 | 220 - 240 | 220 - 240 | 220 - 240 | 220 - 240 | 220 - 240 | 220 - 240 |
| Dimensions | | | | | | | |
| Width [mm] | 213 | 213 | 213 | 213 | 213 | 213 | 213 |
| Height [mm] | 344 | 344 | 344 | 344 | 344 | 344 | 344 |
| Depth [mm] | 407 | 407 | 407 | 407 | 407 | 407 | 407 |
| Weight [kg] | 8 | 8 | 8 | 8 | 8 | 8 | 8 |

KARG Industrietechnik

Emmeram Karg Industrietechnik

Justus-von-Liebig-Ring 15
82152 Krailling
Germany

Phone +49 / 89 / 89 79 61 03-0

Fax +49 / 89 / 89 79 61 03-33

Email info@karg-industrietechnik.de

www.karg-industrietechnik.de

www.karg-industrietechnik.com

www.meltflow.com