

MR Hei-End

Model for highest safety

The MR Hei-End includes all leading safety standards and features for superior ease of use and reduced cost of ownership, plus:

- An independent safety circuit switches off heating at an operator-programmed temperature value above your set temperature
- An additional operational safety step is required to change parameters which prevents unwanted changes to the actual setting
- The digital display allows for easy setting and monitoring of values on the illuminated readout. Speed setting from 30 to 1,400 rpm at an accuracy of $\pm 1\%$ and temperature setting up to 300 °C
- Hotplate residual heat indicator in the digital display illuminates when unit is turned off and hotplate temperature is above 50 °C to prevent accidental operator injury
- To protect your sample from overheating a safety circuit switches off heating if the temperature sensor is not immersed in your media vessel



MR Hei-End
P/N 505-50000-00

MR Hei-End with Pt 1000
P/N 505-50081-00

Software Hei-PC-Control

- Utilize the optional software to control and document the entire process
- MR Hei-End features a digital RS 232 and analog interface for connecting the optional software easily



Hei-PC-Control Software for MR Hei-End
P/N 592-59500-00

Accessories



1-l Heating bath
PTFE-coated
P/N 504-93100-00



2-l Heating bath
PTFE-coated
P/N 504-92000-00



4-l Heating bath
PTFE-coated
P/N 504-91000-00



1-l Heating bath for oil
Max. temperature 250 °C
P/N 504-93000-00



2-l Heating bath for oil
Max. temperature 250 °C
P/N 504-92000-00



4-l Heating bath for oil
Max. temperature 250 °C
P/N 504-91000-00



Concave block adaptor
For 1-l round-bottom flasks
P/N 504-94000-00



Pt 1000 clamping system
(includes support rod and attachment with cable inlet)
P/N 509-63100-00
Pt 1000 clamping system for bath attachments from 3 to 5 liter
(includes support rod and attachment with cable inlet)
P/N 509-63200-00
(see page 17)



Silicone protective cover
Replaceable cover against splashes and dripping water

For MR Hei-Mix D, MR Hei-Mix L, MR Hei-Tec and MR Hei-End
P/N 23-07-06-05-59
For MR Hei-Standard
P/N 23-07-06-05-63



Pt 1000 temperature sensor glass-coated
For MR Hei-End and MR Hei-Tec
P/N 509-67300-00

Pt 1000 temperature sensor stainless steel
For MR Hei-End and MR Hei-Tec
P/N 509-67910-00



Support rod
For temperature sensor length: 425 mm, Ø 13 mm material: stainless steel
P/N 509-81000-00



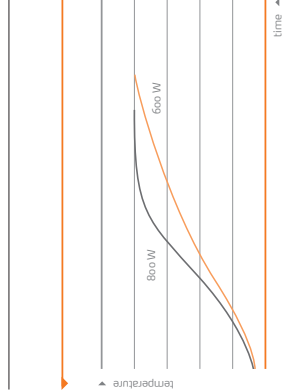
Holding device MR Hei
For safe fixation on lab frames to gain extra lab space. Comes with clamp as standard
P/N 509-96000-00

Stirring bars

| | |
|--|--------------|
| Stirring bars - cylindrical shape (25, 40, 50 mm each) | 509-56000-00 |
| Stirring bars - cross shape (10 mm) pack of 40 pcs. for 5-ml to 10-ml flasks | 509-58400-00 |
| Stirring bars - cross shape (16.5 mm) pack of 20 pcs. for 25-ml to 50-ml flasks | 509-58500-00 |
| Stirring bars - elliptical shape (25 mm) pack of 10 pcs. for 100-ml to 400-ml flasks | 509-58600-00 |
| Stirring bars Evaluation Kit pack of 10 pcs. | 509-58300-00 |
| Stirring bars - oval shape (15x6 mm) pack of 3 pcs. for 10-ml flasks | 509-53000-00 |
| Stirring bars - oval shape (25x10 mm) pack of 3 pcs. for 25-ml to 50-ml flasks | 509-54000-00 |
| Stirring bars - oval shape (30x10 mm) pack of 3 pcs. for 100-ml to 250-ml flasks | 509-55000-00 |
| Stirring bars - oval shape (40 mm) pack of 5 pcs. for 500-ml to 1,000-ml flasks | 509-58100-00 |
| Stirring bars - oval shape (50 mm) pack of 5 pcs. for 2,000-ml flasks | 509-58200-00 |

Heat-up graph

- Take advantage of a built-in PID controller that ensures fastest heat-up times while preventing an overtemperature situation of your sample



Heat-On Attachments

The Heat-On attachments are suitable to replace oil baths and heating mantles in your lab and reduce the risk of fire hazards. Moreover the attachments minimize the messy oil clear-ups that result from changing oil or removing flasks from an oil bath!



» For best results we recommend round-bottom flasks that comply with DIN EN ISO 4797 and DIN EN ISO 24450

- Our attachments are by far the safest, fastest and most efficient method for heating and mixing solutions in round-bottom flasks from 10 ml to 5 liter
- Heat-On fits precisely to every flask, thus ensuring maximum surface contact and fast heat transfer. Eliminates the mess from cleaning flasks after removal from an oil bath or hazardous spills when an oil bath slips off a stirring plate. As a result, oil as a heat transfer media is made redundant and your lab is a safer place with the Heat-On block system

| Flask volume | Volume of water | Hotplate temperature | Time to reach boiling |
|--------------|-----------------|----------------------|-----------------------|
| 10 ml | 6 ml | 300 °C | 6.8 min |
| 2.5 ml | 15 ml | 300 °C | 8.0 min |
| 50 ml | 30 ml | 300 °C | 8.5 min |
| 100 ml | 60 ml | 300 °C | 8.8 min |
| 150 ml | 100 ml | 300 °C | 10.0 min |
| 250 ml | 150 ml | 300 °C | 10.8 min |
| 500 ml | 300 ml | 300 °C | 16.4 min |
| 1,000 ml | 600 ml | 300 °C | 21.1 min |
| 2,000 ml | 1,200 ml | 300 °C | 35.1 min |
| 3,000 ml | 1,800 ml | 300 °C | 47.3 min |
| 4,000 ml | 2,400 ml | 300 °C | 51.0 min |
| 5,000 ml | 3,000 ml | 300 °C | 75.5 min |

Leading Safety Standards

- Prevents accidents, fires and contamination by completely banning all oil baths from your laboratory
- This unique design prevents glass breakage and protects you from spilled chemicals or solvents
- The high temperature range provides unlimited safety for applications up to 260 °C

Superior Ease of Use

- Increase your daily work throughput significantly and reduce your overall process times by quick changing of Heat-On blocks
- Precise temperature control inside the vessel or on the heating block with a thermocouple port that provides actual block temperature back to your MR series hotplate
- 150 ml of water boils in less than 11 minutes

Reduced Cost of Ownership

- A unique PTFE-coating on the aluminum Heat-On body allows for superior chemical resistance and many years of service life
- Save energy costs – 1,000 ml of water heats up 66 % faster than conventional oil baths

Heat-On Attachments

Heat-On blocks

Each Heat-On block is a stand-alone product that can be placed directly onto the stirring hotplate

- Heat-On 250-ml block 595-80067-00
- Heat-On 250-ml block with flask sidearm cutouts 595-80067-01
- Heat-On 500-ml block 595-80069-00
- Heat-On 1-l block 595-80071-00
- Heat-On 2-l block 595-80073-00
- Heat-On 4-l block 595-80078-00
- Heat-On 5-l block 595-80076-00



Heat-On 250-ml block with flask sidearm cutouts

Heat-On 2-l block

Multi-Well holder and inserts

This unique Multi-Well holder is designed to hold either one or two inserts for flasks*. The inserts are available for 10-ml, 25-ml, 50-ml, 100-ml and 150-ml flasks. Flask inserts also feature cut-away sides for use with two or three-neck flasks and accept the optional safety lifting handles

* Only accepts one 150-ml insert



Heat-On Multi-Well holder
P/N 595-80060-00

Heat-On safety lifting handles
P/N 595-80077-00

Insert for Multi-Well holder

- Heat-On 10-ml insert 595-80061-00
- Heat-On 25-ml insert 595-80062-00
- Heat-On 50-ml insert 595-80063-00
- Heat-On 100-ml insert 595-80064-00
- Heat-On 150-ml insert 595-80065-00



Heat-On 10-ml insert

Heat-On 50-ml insert

Heat-On Multi-Well packages

Package Heat-On Multi-Well Basic
Including 1x Multi-Well holder and 3 inserts for 25-ml, 50-ml and 100-ml flasks 595-81300-00

Package Heat-On Multi-Well
Including 1x Multi-Well holder and 6 inserts, 2 each for 25-ml, 50-ml and 100-ml flasks 595-81200-00



PTFE safety covers

PTFE safety cover 500 ml

PTFE Safety Covers

- For Heat-On Multi-Well holder 595-80080-00
- For Heat-On 200-300-ml block 595-80081-00
- For Heat-On 500-ml block 595-80082-00
- For Heat-On 1-l block 595-80083-00

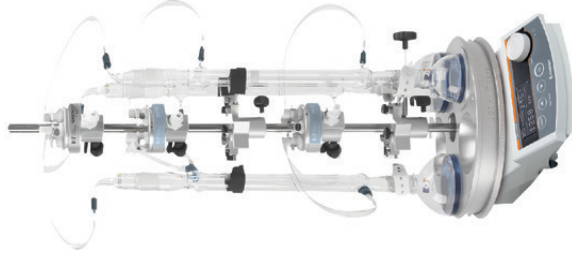


StarFish Workstations

Have you always been looking for a system to perform numerous reactions on a small footprint to significantly reduce space and process times?

With our attachments you can turn your magnetic stirrer into an efficiency-increasing reaction station for up to 45 samples simultaneously!

- Upgrade your magnetic stirrer to a product with multiple capabilities
 - No special glassware purchase required - use your own glassware and individually choose the appropriate attachments for your applications
- Starting from simple heating and mixing tasks including chemical reactions, concentrations, extractions under vacuum and by providing protective gas
 - StarFish workstations are ideal for soxhlet applications



Base plate

Base plate with optional handles fits securely onto the top plate maintaining good thermal contact with the heated surface

StarFish base plate (145 mm)
505-81000-00

StarFish base plate handles (pair)
505-81001-00



MonoBlocks

MonoBlocks are single blocks with multiple wells all of the same size and are ideal for experiments using the same vessel

MonoBlock for 5 x 250-ml flasks
505-80001-00

Inserts for MonoBlock 5 x 250 ml

- 150-ml Flask insert
505-80040-00
- 100-ml Flask insert
505-80041-00
- 50-ml Flask insert
505-80042-00
- 25-ml Flask insert
505-80043-00
- 10-ml Flask insert
505-80044-00
- 5-ml Flask insert
505-80045-00

- MonoBlock for 16 x 25-mm tubes
505-80002-00
- MonoBlock for 16 x 24-mm tubes
505-80003-00
- MonoBlock for 40 x 16-mm tubes
505-80004-00
- MonoBlock for 40 x 12-mm tubes
505-80005-00

- MonoBlock for 16 x 28-mm vials
505-80006-00
- MonoBlock for 20 x 21-mm vials
505-80007-00
- MonoBlock for 40 x 17-mm vials
505-80008-00
- MonoBlock for 40 x 15-mm vials
505-80009-00
- MonoBlock for 40 x 12-mm vials
505-80010-00

Numerous combinations

Cherry-pick from different PolyBlock options in different sizes or one MonoBlock system for identical round-bottom flasks or vials. In addition, you can choose from a large selection of inserts ranging from 5 ml to 150 ml



PolyBlocks

PolyBlocks are smaller segments (5 per StarFish) which can be mixed to accommodate any combination of vessels; allowing the use of different vessel types and sizes at the same time

PolyBlock for 1 x 250-ml flask
505-80020-00

PolyBlock for 3 x 25-mm tubes
505-80021-00

PolyBlock for 3 x 24-mm tubes
505-80022-00

PolyBlock for 9 x 16-mm tubes
505-80023-00

PolyBlock for 9 x 12-mm tubes
505-80024-00

PolyBlock for 3 x 28-mm vials
505-80025-00

PolyBlock for 3 x 21-mm vials
505-80026-00

PolyBlock for 7 x 17-mm vials
505-80027-00

PolyBlock for 9 x 15-mm vials
505-80028-00

PolyBlock for 9 x 12-mm vials
505-80029-00



Universal 5-way clamps

The StarFish clamp allows you to hold glassware of virtually any size and comes with a choice of Silicone rubber or Velcro support straps

Each clamp features 5 telescopic arms which can be extended and locked in place to suit your needs. Using different straps on separate clamps allows you to grip the flask neck with the Silicone rubber strap for lifting, whilst the condenser above slides through the Velcro strap



5-way clamp (Velcro)
P/N 505-81010-00

5-way clamp (Silicone strap and handle)
P/N 505-81020-00

Water-Distribution Manifold

Allows coolant from a single source to be evenly distributed to up to five condensers and then recombines the flow to one outlet pipe

Two manifolds are used in each set-up, one to distribute water to the condenser and one to collect coolant for recirculation or to drain. Connectors feature leak-proof shut-off valves



Water Manifold
With connector
P/N 505-81030-00

Gas/Vacuum-Distribution Manifold

Allows gas or vacuum from a single source to be evenly distributed to up to five positions or vessels (does not control or regulate gas/vacuum flow). Connectors feature leak-proof shut-off valves

- Replacement Self Adhesive Velcro Pads, 200 mm (pack of 10)
505-81050-00
- Replacement Velcro Loop Strips, 200 mm (pack of 5)
505-81050-00
- Replacement Silicone Straps, 200 mm (pack of 5)
505-81050-00
- 650 mm Support rod
505-81060-00
- 650 mm Support split rod
505-81060-00



Gas/Vacuum Manifold
With connector
P/N 505-81040-00

➤ Magnetic Stirrers without Heating

For gentle stirring in biology and microbiology applications

Hei-Mix D / Hei-Mix L

- Top plate is insulated from the motor and protects your heat-sensitive samples from any thermal damage
- To treat your sample gently and protect it from damage the rotation speed ramps up slowly until it has reached the pre-programmed speed
- Top plate diameter of 145 mm and a speed range from 100 to 1,400 rpm is ideal for quantities up to 20 liter
- Hermetically-sealed housing prevents corrosion and increases the service life of your unit
- The Hei-Mix D comes with a digital display for set and actual speed

- You can even work with dry ice - a robust thermal insulation prevents corrosion inside the housing which minimizes dripping of condensate on the electronic components

MR Hei-Mix D

P/N 595-01000-00

MR Hei-Mix L (without display)

P/N 595-00000-00

- These models come with a top plate material of finest-quality stainless steel



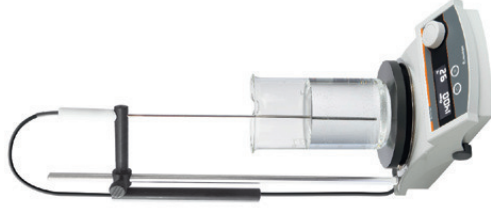
MR Hei-Mix S

P/N 595-02000-00

Hei-Mix S

- Stir quickly and efficiently with an extended speed range up to 2,200 rpm
- Space-saving unit for efficiently mixing sample sizes up to 5 liter. Small footprint of L 140 / W 126 / H 80 mm only, and the top plate comes with a diameter of 104 mm.
- Ideal for titrations due to white-colored top plate
- Long-lasting polyamide housing and PVDF top plate material

➤ MR Plug & Play Packages



MR Plug & Play Hei-Tec

This package includes:

- Magnetic Stirrer MR Hei-Tec
- Temperature sensor Pt 1000 (V4A)
- Pt 1000 clamping system (includes support rod and attachment with cable inlet)

P/N 595-30080-00



MR Plug & Play Multi-Well Hei-Tec

This package includes:

- Magnetic Stirrer MR Hei-Tec
- Temperature sensor Pt 1000
- Pt 1000 clamping system (includes support rod and attachment with cable inlet)
- Heat-On Multi-Well system including Multi-Well holder and the following inserts: 2 x 25 ml, 2 x 50 ml, 2 x 100 ml
- 2 x Retort clamp, 2 x Boss head

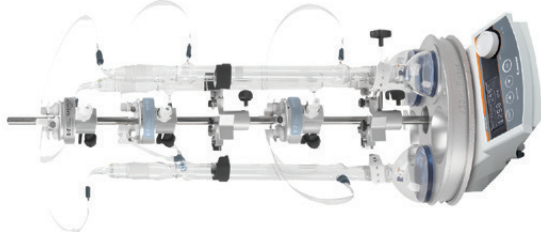
P/N 595-81600-00

MR Plug & Play Multi-Well Hei-Standard

This package includes:

- Magnetic Stirrer MR Hei-Standard
- Heat-On Multi-Well system including Multi-Well holder and the following inserts: 2 x 25 ml, 2 x 50 ml, 2 x 100 ml

P/N 595-81500-00



MR Plug & Play Workstation

This package includes:

- Magnetic Stirrer MR Hei-End
- Temperature sensor Pt 1000
- Base plate
- MonoBlock for 5 x 250 ml flasks
- 2 x 100-ml flask insert
- 2 x 50-ml flask insert
- 1 x 25-ml flask insert
- 5-way clamp (velcro strap)
- 5-way clamp (slicorone strap & handle)
- 2 x Water Manifold
- 1 x Gas/Vacuum Manifold
- 650-mm split rod

P/N 595-81000-00

Technical Specifications - Magnetic Stirrers

| Model | MR Hel-Mix S | MR Hel-Mix L | MR Hel-Mix D | MR Hel-Standard | MR Hel-Tec | MR Hel-End |
|---|---------------------|----------------|----------------|---|---|---|
| P/N | 503-02000-00 | 505-00000-00 | 505-01000-00 | 505-20000-00 | 505-30000-00 | 505-50000-00 |
| Speed range | 0 - 2,200 (rpm) | 100 - 1,400 | 100 - 1,400 | 100 - 1,400 | 100 - 1,400 | 30 - 1,400 |
| Speed accuracy | (%) ± 5 | ± 2 | ± 2 | ± 2 | ± 2 | ± 1 |
| Display | - | - | digital | - | digital | digital |
| Analog/digital interface | - | - | - | - | - | yes |
| Heating power | - | - | - | 800 * | 800 * | 800 * |
| Hotplate temperature | - | - | - | 20 - 300 | 20 - 300 | 20 - 300 |
| Medium temperature, max. | - | - | - | 250 | 250 | 250 |
| Accuracy temperature setting | - | - | - | ± 5 | ± 1 | ± 1 |
| External temperature sensor | - | - | - | Pt 1000 | Pt 1000 | Pt 1000 |
| Temperature accuracy with external temperature sensor | - | - | - | ± 1 | ± 1 | ± 0.2 |
| Sensor leakage protection | - | - | - | with Pt 1000 | with Pt 1000 | with Pt 1000 |
| Temperature control | - | - | - | Micro controller | Micro controller | Micro controller |
| Temperature accuracy hotplate | - | - | - | ± 5 | ± 5 | ± 5 |
| Safety circuit hotplate | - | - | - | 25 °C over hotplate temperature | 25 °C over hotplate temperature | 10 - 35 °C over nominal temperature |
| Stirring capacity, max. (H ₂ O) | (l) 5 | 20 | 20 | 20 | 20 | 20 |
| Load, max. | (kg) 6 | 25 | 25 | 25 | 25 | 25 |
| Power consumption | (W) 7 | 20 | 20 | 820 | 820 | 825 |
| Permissible ambient temperature | (°C) 0 - 40 | 0 - 40 | 0 - 40 | 0 - 40 | 0 - 40 | 0 - 40 |
| Max. relative humidity | (%) 80 | 80 | 80 | 80 | 80 | 80 |
| Plate diameter | (mm) ø 104 | ø 145 | ø 145 | ø 145 | ø 145 | ø 145 |
| Plate material | PVDF | VzA | VzA | Kera-Disk® (Silumin with ceramic coating) | Kera-Disk® (Silumin with ceramic coating) | Kera-Disk® (Silumin with ceramic coating) |
| Weight | (kg) 1.2 | 2.6 | 2.6 | 2.9 | 2.6 | 2.6 |
| Dimensions (L x W x H) | (mm) 126 x 140 x 80 | 173 x 277 x 94 | 173 x 277 x 94 | 173 x 277 x 94 | 173 x 277 x 94 | 173 x 277 x 94 |
| Protection class (DIN EN 60529) | IP 21 | IP 32 | IP 32 | IP 32 | IP 32 | IP 32 |

* 600 W for 15 V-units
Standard supply voltage: 230 V - other voltages upon request, please specify for order

Certificate

To confirm the ability for continuous operation

of the MR Series Magnetic Stirrers with hotplate

The MR Series Magnetic Stirrers with hotplate feature overtemperature safety circuits according to DIN EN 61010-1:2001 and DIN EN 61010-2-010:2003 and therefore are designed for continuous operation.

This statement is made under the precondition that all units are operated in accordance with the operation manual and in accordance with good practice standards for safety in laboratories, rules for accident preventions, and compliance with directions on hazardous materials.

Schwabach, January 2013

i. V. Jan Weizien
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