

Instructions

StarFish™

Multi-Experiment Work Station



Heidolph
Research made easy

Heidolph Instruments GmbH & Co.KG

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Thank you for purchasing your StarFish Multi-experiment Work Station

Please read this Instruction Manual thoroughly before operating your unit.

Introduction

The StarFish is a highly affordable system that enables you to perform productive heating and stirring experiments using existing glassware and stirring hotplates.

The StarFish's innovative modular design accepts round-bottomed flasks, test tubes and vials and can be used with most leading brands of stirring hotplate. This versatile system offers the flexibility to heat and stir the contents of different vessel types simultaneously, with an optional clamping system to hold accessory glassware, such as condensers and soxhlet extractors.

Small footprint...

Uses less space than multiple heating and stirring set-ups

Versatility...

Accommodates a wide range of vessel types and accessory glassware

Productivity...

Allows you to heat and stir multiple experiments in parallel

Safer cleaner working...

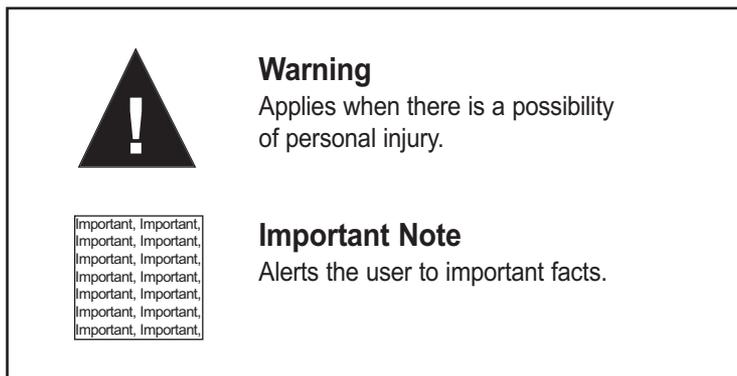
Eliminates the need for oil baths

Money saving...

Allows you to use existing labware more productively

Safety Information

The following symbols are intended to assist the user in the safe and efficient operation of the StarFish.



Important WARNINGS

Please read these instructions completely before using your StarFish multi-experiment work station.

Operate only in a fume cupboard with protective safety sash.

During and after heating take care not to touch the aluminium reaction block.

Always ensure that the StarFish heated base has cooled sufficiently before removal from the hotplate.

Please ensure all heated vessels have suitable pressure relief.

It is not recommended to heat any sealed vessel.

Maximum recommended operating temperature is dependent upon stirring hotplate used.

To avoid the build up of lime scale in the water distribution manifold, please avoid the use of hard water.

The StarFish multi-experiment work station should only be operated by trained and competent personnel. As with all chemistry, care should be taken to monitor your experiment at all stages.

The StarFish should not be left unattended unless in a supervised area.



Important Note

The StarFish should only be operated by trained and competent personnel. As with all chemistries care should be taken to monitor your experiment at all stages. The StarFish should not be left unattended unless in a supervised area.

Products & Accessories

Heidolph Cat No.	Description	Pk Qty
MR Hei-End Multi-Workstation Complete System		
505-81100-00	1 x Magnetic Stirrer MR Hei-End, Pt 1000 (V4A), Base Plate (145mm) 1 x Monoblock for 5 x 250ml Flasks 2 x Inserts for 100ml Flasks 2 x Inserts for 50ml Flasks 1 x Inserts for 25ml Flask 1 x 5-way Clamp (with Velcro) 1 x 5-way Clamp (with Silicone strap & handle) 2 x Water Manifolds with connectors 1 x Gas/Vacuum Manifold with connectors 1 x 650mm Split Rod	
Stirring Hotplates		
505-20000-00	Hei-Standard	
509-88000-00	Hei-Con	1
505-30000-00	Hei-Tec	1
StarFish Bases		
505-81000-00	StarFish Base Plate 145mm (for Heidolph)	1
Base Plate Handles		
505-81001-00	StarFish Base Plate Handles (Pair)	2
MonoBlocks		
505-80001-00	MonoBlock for 5 x 250ml Flasks	1
505-80002-00	MonoBlock for 16 x 25mm Tubes	1
505-80003-00	MonoBlock for 16 x 24mm Tubes	1
505-80004-00	MonoBlock for 40 x 16mm Tubes	1
505-80005-00	MonoBlock for 40 x 12mm Tubes	1
505-80006-00	MonoBlock for 16 x 28mm Vials	1
505-80007-00	MonoBlock for 20 x 21mm Vials (4 dram)	1
505-80008-00	MonoBlock for 40 x 17mm Vials (2 dram)	1
505-80009-00	MonoBlock for 40 x 15mm Vials (1 dram)	1
505-80010-00	MonoBlock for 40 x 12mm Vials (2ml)	1
PolyBlocks		
505-80020-00	PolyBlock for 1 x 250ml Flask	1
505-80021-00	PolyBlock for 3 x 25mm Tubes	1
505-80022-00	PolyBlock for 3 x 24mm Tubes	1
505-80023-00	PolyBlock for 9 x 16mm Tubes	1
505-80024-00	PolyBlock for 9 x 12mm Tubes	1
505-80025-00	PolyBlock for 3 x 28mm Vials	1
505-80026-00	PolyBlock for 3 x 21mm Vials (4 dram)	1
505-80027-00	PolyBlock for 7 x 17mm Vials (2 dram)	1
505-80028-00	PolyBlock for 9 x 15mm x Vials (1 dram)	1
505-80029-00	PolyBlock for 9 x 12mm x Vials (2ml)	1
StarFish Inserts		
505-80040-00	150ml Flask Insert	1
505-80041-00	100ml Flask Insert	1
505-80042-00	50ml Flask Insert	1
505-80043-00	25ml Flask Insert	1
505-80044-00	10ml Flask Insert	1
505-80045-00	5ml Flask Insert	1
StarFish Support Rods		
505-81050-00	650mm Rod	1
505-81060-00	650mm Split Rod	1
StarFish Clamp		
505-81010-00	Universal Telescopic 5-way Clamp (with Velcro)	1
505-81020-00	Universal Telescopic 5-way Clamp (with Silicone Strap & Handle)	1
505-81070-00	Replacement Self Adhesive Velcro Pads	10
505-81080-00	Replacement Velcro Loop Strips 200mm	5
505-81090-00	Replacement Silicone Strap 200mm	5
StarFish Distribution Manifolds		
505-81030-00	Water Manifold with connectors	1
505-81040-00	Gas/Vacuum Manifold with connectors	1
Accessories		
509-8100-00	Set spin bars oval stirring 40mm for 500 to 1000ml flasks	5
509-8200-00	Set spin bars oval stirring 50mm for 2000ml flasks	5

Set-Up & Operation - Heating & Stirring

Optimising the temperature performance of your StarFish

The heating performance of your StarFish will be affected by:

1. The limit of the maximum operating temperature of the stirring hotplate.
2. Heating power (Watts) of the stirring hotplate.
3. Flatness of the top plate on the stirring hotplate.
4. Ambient temperature.
5. Load to be heated.
6. Maximum housing temperature of the stirring hotplate.
7. Whether you use a separate temperature controller (probe) see overleaf.



Warning

When placing oil baths, sand baths or aluminium blocks etc onto a stirring hotplate the increased surface area will reflect heat back to the stirring hotplate. In such instances care should be taken to ensure that the hotplates external housing does not exceed the maximum temperature recommended by the manufacturer. Such overheating can cause damage to internal and/or external parts and lead to failure of your stirring hotplate.



Warning

Always refer to the manufacturers operating instructions for your stirring hotplate before using it with the StarFish to be sure of any limitations or safety restrictions.

Using a separate temperature controller

For accurate temperature control of your block and/or solution temperature we recommend using a temperature controller such as the **Hei-Con Temperature Sensor V2A (509-88000-00)**.

All StarFish blocks feature a hole (3.5mm ID) for inserting a temperature probe.

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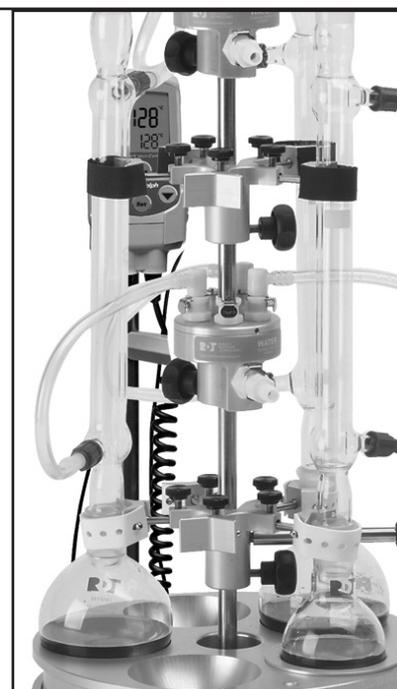
Important Note

Please note that typically temperature controllers should be set between 5°C and 15°C above the boiling point of the solvent to achieve a gentle reflux.



Warning

Temperature controller wire/cable should not contact with the heated base of the StarFish. Always rotate the StarFish base to ensure that the probe hole is nearest the probe socket on the stirring hotplate.



Set-Up & Operation - Heating & Stirring

Optimising the stirring performance of your StarFish

The StarFish system uses the single rotating magnetic field of the stirring hotplate to stir all vessel positions. The various StarFish blocks have been optimised to work with leading brands of stirring hotplates.

The stirring performance of your StarFish will be affected by:

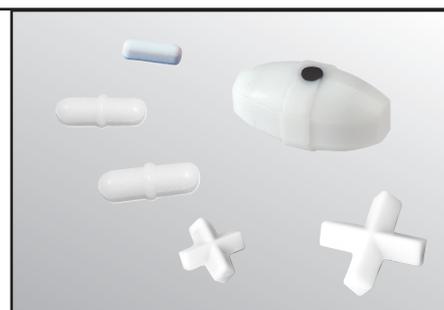
1. The limit of the maximum stirring speed of the stirring hotplate.
2. Power and size of the magnet within the stirring hotplate.
3. Selection of an appropriate magnetic stirring bar for your chosen vessel
4. Viscosity of sample.



Wide choice of magnetic stirring bars

Selection of an appropriate magnetic stirring bar for your chosen vessel is key to the performance of stirring within the StarFish.

For full listing of suitable stirring bars for StarFish please see pages 15 and 16 (StarFish Quick Selection Guide)



Locating the StarFish base plate on the stirring hotplate

The recess in the base plate is designed to locate on the top plate of the stirring hotplate. Ensure that the top plate is dust and grit free thereby ensuring good contact between the hotplate surface and the underside of the base plate.

The base plate design allows it to be easily lifted on and off the stirring hotplate as required.

Optional insulated handles (505-81001-00) can be fitted to facilitate the removal of the assembly whilst hot (see below).



Set-Up & Operation - Base Plate & Optional Handles

Fitting optional insulated handles to base plate

Optional insulated handles facilitate the convenient removal of the base plate.

These handles are insulated from the base plate by a peek spacer which allows the base plate to be picked up when hot. The handles also allow the base plate to be placed on to a suitable laboratory surface without causing damage by the heat of the base plate.

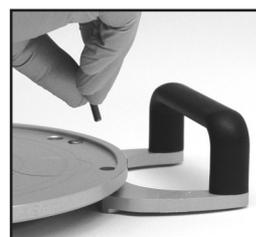
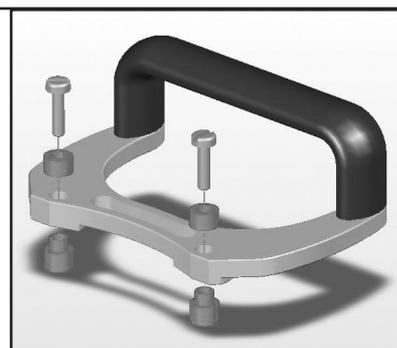


Warning

When lifting using the handles, always be sure to touch only the insulated handle and not the metal plate, which may be too hot to touch and may cause injury.

The handles are fitted to the base plate with two screws (see exploded view at right).

1. The handles are fitted with captive nuts retained in peek bushes which insert into the aluminium base of the plate handle and then protrude through the upper surface.
2. Peek spacers are then located from above on to each of the two protruding bushes.
3. To fit the handle, present the handle plate to the underside to the base plate.
4. A fixing screw is then inserted from the top, through the base plate top, through the peek spacer and then screws into the captive nut located in the lower peek bush.
5. The screws are then screwed securely with a flat-head screwdriver.
6. The same procedure is then repeated for the other handle



Warning

Repeated heating and cooling of the base plate and handles may cause the handles to loosen with time. Always check handles are tight before each use.



Warning

Extreme caution should always be used when lifting hot vessels or objects. Please check with your laboratory safety officer to ensure that you are complying with all relevant safety procedures.

Many laboratories do not permit the handling of hot liquids or objects and therefore the use of the optional StarFish handles may not be permitted within such a laboratory.

Set-Up & Operation - Locating MonoBlocks & PolyBlocks

Locating Monoblocks on to the base plate

The Monoblocks are designed to locate on to the StarFish base plate to give a secure base for your experiments.

1. Select the appropriate MonoBlock for your chosen vessels. Each MonoBlock is designed for a specific size of glassware and is identified accordingly with engraving on the side of the block.
2. Present the MonoBlock to the base plate and place your fingers around the top rim of the MonoBlock.
3. Rotate MonoBlock until the three feet of the MonoBlock locate into the holes in the base plate.
4. The MonoBlock will drop down to allow good thermal contact with the Base Plate.



Warning

Take care not to catch your fingers between the base plate and MonoBlock.



Locating Polyblocks on to the base plate

The Polyblocks are designed to locate on to the StarFish base plate to give a secure base for your experiments.

1. Select the appropriate Polyblocks for your chosen vessels - note that it is possible to mix different sized blocks simultaneously. Each PolyBlock is designed for a specific size of glassware and is identified accordingly with engraving on the side of the block.
2. Place the PolyBlock onto the base plate with the flat edge of the PolyBlock against one of the flats of the pentagonal centre post.
3. Ensure that the Polyblock is completely contained within the rim of the base plate to allow good thermal contact.



Warning

Take care not to catch your fingers between the base plate and PolyBlock.

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Important Note

Please see pages 15 and 16 (StarFish Quick Selection Guide) for assistance in selecting the appropriate MonoBlocks and PolyBlocks.



Set-Up & Operation - Aluminium Flask Inserts

Aluminium inserts are designed to adapt the 250ml MonoBlock or PolyBlock to accept 5ml, 10ml, 25ml, 50ml, 100ml, 150ml and 250ml round bottomed flasks.

1. Select appropriate insert. The insert size is engraved on the rim.
2. Place correct insert in the 250ml well, taking care to make sure it is fully located.
3. The aluminium inserts are designed in such a way that should the flask fall over it will still remain supported at such an angle as to retain the typical working volume of that flask. However we recommend the use of the **505-81020-00** Universal Telescopic 5-Way Clamp when using any round bottomed flasks.
4. When clamping smaller flasks the use of a glass joint adapter to extend the neck of the flask will assist in clamping.



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Important Note

The aluminium inserts are designed in such a way that should the flask fall over it will still remain supported at such an angle as to retain the typical working volume of that flask.



Fitting central support rod to base plate

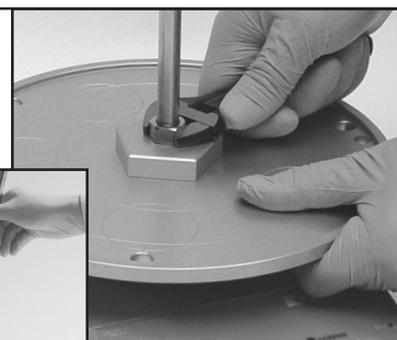
There are a choice of two support rods; the **505-81050-00** 650mm one piece rod and the two piece **505-81060-00** 650mm split rod. The split rod allows for shorter assemblies.

1. Screw the rod into the tapped central hole at the centre of the base plate
2. Using a suitably sized adjustable spanner, tighten the captive nut attached to the rod to securely mount the rod to the base assembly.



Warning

It is important to ensure that the rod is tighten securely using a spanner, otherwise the assembly may unscrew and become unstable during use.



Set-Up & Operation - Universal Telescopic 5-Way Clamp

Universal Telescopic 5-Way Clamp

The StarFish clamping system is designed to neatly and conveniently support round bottomed flasks, condensers etc when used with PolyBlocks & MonoBlocks.

Each clamp features five telescopic arms with Silicone or Hook & Loop straps which can each be extended and locked in place to suit your needs. The detachable Silicone or Hook & Loop straps allow the clamping of a wide range of glassware diameters (approximately 20mm to 60mm \varnothing).

1. Present clamp to rod. It may be necessary to extend the arms nearest to the slotted opening to allow the support rod to pass through to centre of the clamp.
2. Position at the desired height and tighten boss thumbwheel.
3. Adjust length of telescopic arms to maintain centre point of glassware above wells in base plate.
4. The glassware is retained by placing the Silicone or loop strap around the glassware and fixing it to the screw or on the outside surface each side of the clamp end piece.

Nylon Hook & Loop straps and self adhesive pads are consumable items and will need periodic replacement. Should you need to replace them please order:

505-81070-00 Replacement Self Adesive Velcro Pads (pack of 10)

505-81080-00 Replacement Velcro Loop Strips 200mm (pack of 5)

505-81090-00 Replacement Silicone Strap 200mm (pack of 5)

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Important Note

Nylon Hook & Loop straps and self adhesive pads offer temperature resistance to 140°C with a melting point of 260°C. They will also resist strong alkalis, trichlorethylene, acetone, acids, hydrocarbons and alcohols.

Exposure of Hook & Loop to sunlight for extended periods is not recommended

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Important Note

The telescopic arms are retained within the body of the clamp in normal use. To remove the arm, completely unscrew the arm-fixing thumbwheel.

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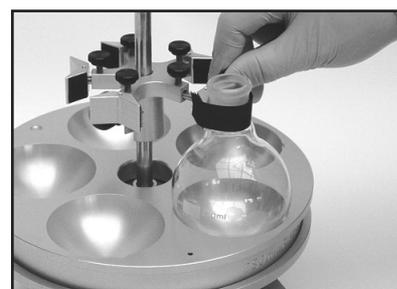
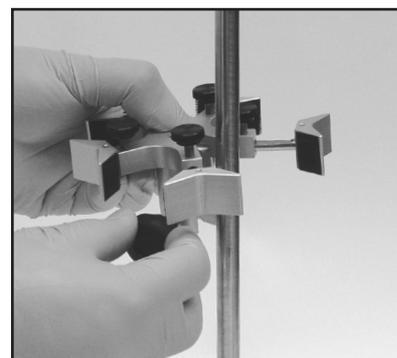
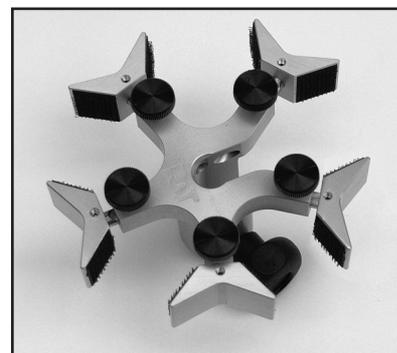
Important Note

When clamping smaller flasks the use of a glass joint adapter to extend the neck of the flask will assist in clamping.



Warning

The Hook & Loop strapping system is not designed to suspend unsupported glassware.



Set-Up & Operation - Water Distribution Manifolds

Water Distribution Manifold

Water Distribution Manifolds have been designed to allow coolant from a single source to be evenly distributed to up to five condensers and then the flow re-combined to one outlet pipe. Two manifolds are used in each system, one to distribute water to the condensers and one to collect coolant for recirculation or to drain.

1. Confirm that the manifolds are Water Manifold 505-81030-00 rather than Gas/Vacuum Manifolds. The Water Manifold is identified by the label and fitted with a female connector on the side of the manifold body.

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Important Note

Water Manifold 505-81030-00 is fitted with a female inlet/outlet connector, whilst the Gas/Vacuum Manifold 505-81040-00 is fitted with a male inlet/outlet connector. This prevents incorrect connection of fluid and gas supplies.

2. Place both Water Manifolds over the top of support rod and slide down to the desired position and fix with the thumbwheel. (It does not matter which way up the manifolds are fitted to the support rod).
3. Push the the large barbed connector (supplied with the Water Manifold) into your water inlet tubing. (For suitable tubing please order - 8mm x 15m clear Tygon Tubing).

NB. The connector has a 9.6mm OD barb with an 6.4mm bore and accepts flexible tubing with an 8mm ID.

4. Now the tubing is connected to the connector, insert it into the female connector on the side of the lower of the two Water Manifolds. It will click in place.
5. Repeat the procedure with the water outlet/drain tubing. Connecting it to the connector on the upper of the two Water Manifolds.
6. Connect the tubing from each of your condenser inlets to a right-angled connector (5 are supplied with each Water Manifold). (For suitable tubing please order 6.4mm x 15m clear Tygon Tubing).

NB. The right-angled connector has a 6.4mm OD barb with an 3.2mm bore and accepts flexible tubing with an 6.4mm ID.

7. Now the tubing is connected to the right angled connector, insert it into any one of the five female connectors on the top of the lower Water Manifold. It will click in place.
8. Repeat the procedure with the with the upper Water Manifold, connecting each of the condenser outlets to the manifold. For best results coolant should always enter the bottom of you condenser and exit at the top.
9. A water flow rate of at least 1.5 litres per minute should be used to maintain even distribution to each condenser.

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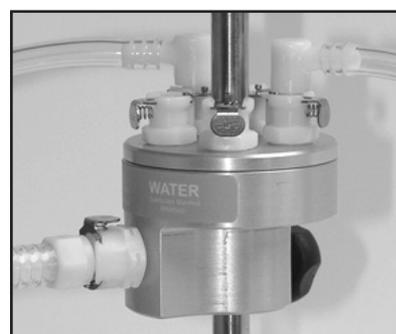
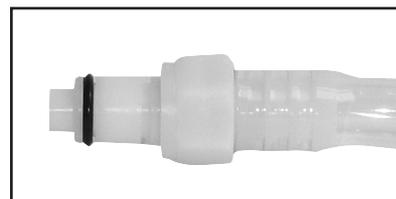
Important Note

All of the connectors feature leak-proof shut-off valves that are automatically closed when the couplings are parted. This enables the manifold to be used with any number of condensers (up to five) without daisy-chaining.

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Important Note

To avoid the build-up of lime scale in the Water Distribution Manifold, please avoid the use of hard water.



Set-Up & Operation - Gas/Vacuum Distribution Manifold

Gas/Vacuum Distribution Manifold

Gas/Vacuum Distribution Manifolds have been designed to allow gas or a vacuum from a single source to be evenly distributed to up to five vessels.

1. Confirm that the manifold is Gas/Vacuum Manifold 505-81040-00 rather than a Water/Coolant Manifold. The Gas/Vacuum Manifold is identified by the label and fitted with a male connector on the side of the manifold body.

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Important Note

Water Manifold 505-81030-00 is fitted with a female inlet/outlet connector, whilst the Gas/Vacuum Manifold 505-81040-00 is fitted with a male inlet/outlet connector. This prevents incorrect connection of fluid and gas supplies.

2. Place the Gas/Vacuum Manifold over the top of support rod and slide down to the desired position and fix with the thumbwheel. (It does not matter which way up the manifold is fitted to the support rod).
3. Push the the large barbed connector (supplied with the Gas/Vacuum Manifold) into your gas inlet tubing. (For suitable tubing please order - 8mm x 15m clear Tygon Tubing).

NB. The connector has a 9.6mm OD barb with an 6.4mm bore and accepts flexible tubing with an 8mm ID.

4. Now the tubing is connected to the connector, insert it into the male connector on the side of Gas/Vacuum Manifold. It will click in place.
5. Connect the tubing from each of your vessels to a right-angled connector (5 are supplied with each Gas/Vacuum Manifold). (For suitable tubing please order 6.4mm x 15m clear Tygon Tubing).

NB. The right-angled connector has a 6.4mm OD barb with an 3.2mm bore and accepts flexible tubing with an 6.4mm ID.

7. Now the tubing is connected to the right angled connector, insert the connector into any one of the five female connectors on the top of the Gas/Vacuum Manifold. It will click in place.



Warning

The manifold can be used for both vacuum and gas purging.

The maximum operating pressure is 0,2mbar above atmospheric pressure and a vacuum of approximately 150 to 125mbar.

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Important Note

All of the connectors feature leak-proof shut-off valves that are automatically closed when the couplings are parted. This enables the manifold to be used with any number of vessels (up to five) without daisy-chaining.



StarFish Quick Selection Guide

Vessels	RDT Vessels	PolyBlock	MonoBlock	Stirring Bar
Vials from 12 to 21mm Ø				
 2ml Vial (12mm Ø x 35mm)		 12mm Ø x 9 505-80029-00	 12mm Ø x 40 505-80010-00	 Cylindrical Stirring Bar 8mm
 1 Dram (15mm Ø x 45mm)		 15mm Ø x 9 505-80028-00	 15mm Ø x 40 505-80009-00	 Pivot Ring Stirring Bar 12mm
 2 Dram (17mm Ø x 60mm)		 17mm Ø x 7 505-80027-00	 17mm Ø x 40 505-80008-00	 Pivot Ring Stirring Bar 15mm
 4 Dram (21mm Ø x 70mm)		 21mm Ø x 3 505-80026-00	 21mm Ø x 20 505-80007-00	 Pivot Ring Stirring Bar 15mm
Tubes from 12 to 25mm Ø				
 Test Tube (12mm Ø x 100mm)	 GreenHouse Classic Reaction Tube (12mm Ø x 100mm)	 12mm Ø x 9 505-80024-00	 12mm Ø x 40 505-80005-00	 Pivot Ring Stirring Bar 12mm
 Test Tube (16mm Ø x 100mm)	 GreenHouse Plus Reaction Tube (16mm Ø x 100mm)	 16mm Ø x 9 505-80023-00	 16mm Ø x 40 505-80004-00	 Pivot Ring Stirring Bar 15mm
 Test Tube (24mm Ø x 150mm)	 Carousel Reaction Tube (24mm Ø x 150mm)	 24mm Ø x 3 505-80022-00	 24mm Ø x 16 505-80003-00	 Cross Shaped Stirring Bar 16.5mm RE
 Test Tube (25mm/1 inch Ø)		 25mm Ø x 3 505-80021-00	 25mm Ø x 16 505-80002-00	 Cross Shaped Stirring Bar 16.5mm RE

StarFish Quick Selection Guide

Vessels	RDT Vessels	PolyBlock	MonoBlock	Inserts	Stirring Bar
Round Bottom Flasks from 5ml - 250ml...					
 5ml Round Bottom Flask	 5ml RDT Reaction Flask	 250ml x 1 505-80020-00	 250ml x 5 505-80001-00	 5ml Aluminium Insert 505-80045-00	 Small Cross Shaped (4.9mm x 10mm)
 10ml Round Bottom Flask	 10ml RDT Reaction Flask	 250ml x 1	 250ml x 5	 10ml Aluminium Insert 505-80044-00	 Small Cross Shaped (4.9mm x 10mm)
 25ml Round Bottom Flask	 25ml RDT Reaction Flask	 250ml x 1	 250ml x 5	 25ml Aluminium Insert 505-80043-00	 Rare Earth Medium (7mm x 16.5mm)
 50ml Round Bottom Flask	 50ml RDT Reaction Flask	 250ml x 1	 250ml x 5	 50ml Aluminium Insert 505-80042-00	 Rare Earth Medium (7mm x 16.5mm)
 100ml Round Bottom Flask	 100ml RDT Reaction Flask	 250ml x 1	 250ml x 5	 100ml Aluminium Insert 505-80041-00	 Rare Earth Elliptical (25.1mm x 15.5mm)
 150ml Round Bottom Flask	 150ml RDT Reaction Flask	 250ml x 1	 250ml x 5	 150ml Aluminium Insert 505-80040-00	 Rare Earth Elliptical (25.1mm x 15.5mm)
 250ml Round Bottom Flask	 250ml RDT Reaction Flask	 250ml x 1	 250ml x 5		 Rare Earth Elliptical (25.1mm x 15.5mm)

Warranty & Liability

Warranty

Heidolph Instruments provides a three-year warranty on the products described here (with the exception of glass and consumable parts) if registered with enclosed warranty card or via internet (www.heidolph.com). Warranty starts with the date of registration. Without registration warranty starts according to serial number. This warranty covers defects in materials and workmanship.

Transit damage is excluded from this warranty.

To obtain such warranty service, contact Heidolph Instruments (phone: +49 – 9122 - 9920-68) or your local Heidolph Instruments Dealer. If defects in material or workmanship are found, your item will be repaired or replaced at no charge.

Misuse, abuse, neglect or improper installation are not covered by this warranty promise.

Alterations to the present warranty promise need Heidolph Instruments' consent in writing.

Exclusion of liability

Heidolph Instruments cannot be held liable for damage from improper use or misuse. Remedy for consequential damage is excluded.

Questions & Repairs

If any aspect of installation, operation or maintenance remains unanswered in the present manual, please contact us at the following address:

Heidolph Instruments GmbH & Co. KG
Vertrieb Labortechnik
Walpersdorfer Str. 12
D-91126 Schwabach, Germany
Tel.: +49 – 9122 - 9920-68
Fax: +49 – 9122 - 9920-65
E-mail: sales@heidolph.de

For equipment repair jobs please call Heidolph Instruments (phone: +49 – 9122 - 9920-68) or your local authorised Heidolph Instruments dealer.

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Important Note

Please return instruments to the above address only. Returning instruments is subject to prior approval.

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Important Note

When returning instruments for repair that have come in contact with hazardous substances, please:

- Provide precise information on the relevant medium.
- Take protective measures to ensure the safety of our receiving and maintenance personnel.
- Mark the package as appropriate for hazardous materials.





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