Reaction apparatus with agitator and double wall vessel 0.1 - 5 litres

We deliver the systems **without motor**, but with manual and CE certificate.

The double cardan coupling enables a tension-free drive of the agitator even in case of high speeds.

The FEP coated silicone O-ring can be used up to **230°C**. The SS flange holder can be used up to 300°C.

The side arms are fitted with SS hose connectors for metallhoses. The sealings are resist up to **230°C**

When manufactured in series, the **fully vacuum compatible** double wall vessel is approved for pressures of up to 0.5 bar, but it can be designed for **higher pressures** also. The apparatus can be equipped with a **turbo tempering unit** ensuring a more balanced and in the bottom area considerably improved energy transfer.

The rigid stainless steel pipe frame can be easily expanded or converted by means of universal anodized aluminium connecting components.

All systems are provided with a low-maintenance mechanical seal with ball bearings for the stirrer.

Optinally the lid can be provided with other necks like flanges or threads according to the **customer requirements**.

The 10 to 25 mm bottom valve does not only close **deadvolume-free** it ensures a residue-free discharge out of the valve room itself. A **spring** absorbs the pressure caused by the heat extension of the valve spindle and readjusts the spindle automatically during cooling down.

**For problematic cases** the valve can optionally be tempered or fitted with a peek spindle. Especially in case of emerging crystals it can be provided with Viton- or Kalrez O-ring.

The measurements:

350 x 500 x 1300 mm
The table rack based system is already fitted to cope with most of the problems occurring in laboratories. When manufactured in series it is already suited for pressures up to 0,5 bar and temperatures up to 200° C. Optionally it can be designed for temperatures of up to 300° C or pressures up to 2 bar. The expandable system enables almost all reaction system applications occurring within a laboratory.

A PFA coated anchor stirrer for high-viscous media as well as a reversal stirrer for low-viscous media are integrated in the system. For spare agitators or agitators made of stainless steel please see the list of spare parts or the catalogue.

### Capacity over pressure

<table>
<thead>
<tr>
<th>Litres</th>
<th>max.</th>
<th>Necks (NS)</th>
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<th>DN 100</th>
<th>DN 120</th>
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</table>

### Standard Equipment

Glass reactor with death volume free, springloaded valve 10 mm, lid, O-ring made of seamless FEP coated silicone, ball beared mechanical seal, PFA coated SS anchor stirrer, PFA coated SS reversal stirrer, stirrer-motor coupling, stainless steel hose connectors to M16 x1, stainless steel frame with anodized aluminium connection parts including holder for the stirrer motor. Stainless steel holder for the reactors, manual, CE certificate.

### Optional Accessories

#### Hose connectors:

- Hose connectors for hoses 10 mm: 188411510
- Hose connectors for hoses 12 mm: 188411512
- Hose connectors for hoses M 24 x 1.5: 188411524
- Hose connectors for hoses M 30 x 1.5: 188411530

#### Valves:

- Larger valves: There are reactors with 16 mm, 20 mm and 25 mm valves available.

#### Motors:

- R50 D 50 W 220 V 0.3 Nm: 4060216
- R80 D 80 W 220 V 0.8 Nm: 406038012
- R80 D PC 80 W 220 V 0.8 Nm with RS 232 and PC program for remote controlling: 406038013
- SD 180 W 220 V 100 Ncm: 4060217
- R100 C 300 W 220 V 150 Ncm and PC program for remote controlling: 4060218
- R100 CT 300 W 220 V 600 Ncm and PC program for remote controlling: 4060314
We offer different sizzes as standard reaction systems Typw DSS 01 from 250 ml up to 5 lit.

All systems have following advantages:
- A double wall or triplex wall reactor
- A lid with a nosele for vapor, one for solid feed, one for the temperature sensor, one for the feed and one reserve, which can be used also for a pH sensor.
- A funnel for the solid feet
- A strong stirrer motor
- A Diehm reversal stirrer for less viscouse- and a anchor stirrer for high viscose liquids
- Stirrer material SS, PTFE -ceramic coated
- A mechanical seal for a stabil vacuum less than 1 mbar
- A temperature probe which is working also as disturbing pipe, with two sensors, variable adjustable in the hight and position
- A reflux divider with enought cooling capacity
- one dosing vessel
- one receiver vessel
- A vacuum divider with vacuum hoses and connections.
- A frame for the complete system
- A Options for temperature and pressure indication, overpressure devise, phase divider
  a second feed vessel as well as a second receiver vessel.
- Thermostatic connections M 16 x 1,0
- Certificates for all details
- connections at the condensator:
  2 x 10 mm cooling water connections,
  GL 18 for vapor temperature below and safety temperature at the end
  2 x GL 18 for vacuum
  KF 15/3 for pressure sensor
  over pressure device at the end of the condensator

Frame made of anodized aluminium connection parts and polished SS tubes. Wide x depth x hight 350 x 500 x 1400 to 1600 mm
**Second dosing or receiver sets**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Dosing set Complete with all holders and pipelines useful for all systems</th>
<th>Receiver set Complete with all holders and pipelines useful for all systems</th>
<th>Vacuum divider with additional pipelines and holders</th>
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<tr>
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<td>3700020100</td>
<td>4 lines 3700040114</td>
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<td>250 ml</td>
<td>37000101250</td>
<td>3700020250</td>
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<tr>
<td>500 ml</td>
<td>3700010500</td>
<td>3700020500</td>
<td>5 lines 3700040115</td>
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<tr>
<td>1000 ml</td>
<td>3700011000</td>
<td>3700021000</td>
<td></td>
</tr>
<tr>
<td>2000 ml</td>
<td>3700012000</td>
<td>3700022000</td>
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</table>

**Distillation sets**

<table>
<thead>
<tr>
<th>DN</th>
<th>Packed column set Complete with all holders</th>
<th>Working additional frame tube length</th>
<th>Length</th>
<th>Article no.</th>
<th>Phase divider set Complete with all holders and PTFE-pipelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>S 29</td>
<td>250 mm</td>
<td>0</td>
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<td>3700050022</td>
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<tr>
<td>100</td>
<td>S 29</td>
<td>250 mm</td>
<td>1800 mm</td>
<td>3700030229</td>
<td>3700050022</td>
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<tr>
<td>120</td>
<td>S 41</td>
<td>250 mm</td>
<td>1800 mm</td>
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<tr>
<td>150</td>
<td>S 41</td>
<td>250 mm</td>
<td>1800 mm</td>
<td>3700030441</td>
<td>3700050022</td>
</tr>
</tbody>
</table>

The distillation set is provided with a vacuum-insulated column, rotulex ball connections. Below is a GL 18 for the reflux from a phase divider and a GL 18 for a temperature sensor.

**4 line indication**

Indication box for 3 temperatures and pressure provided with 2 additional 4 wire temperature probes, a pressure sensor and a cable for the reactor sensor. All needed holders are included.

Temperature range -199.0 to +850.0 °C or -327.8 to +1562.0 °F
The flexible swivel joint allowed a stressless impulsion of the stirrer also at high revs.

Optionally the cap can be provided with cuts and threads according to the customer’s requirements thus adapting to all conditions of use.

The tempering vessel, which in series is fitted with metal hose connectors being suitable for temperatures up to 200°C, generally can cope with an interior pressure of 0.5 bar. Of course, the vessel is fully vacuum compatible. A provision for higher pressures can also be made. Besides, it can optionally be fitted with a turbo tempering unit ensuring a more steady tempering being considerably improved in the bottom area.

The rack components can be anodized aluminium with SS roods or complete SS.

The agitator’s lock with its replaceable sealing lamellas guides the agitator on a great distance from both PTFE bearings.

The tempering connectors are fitted with SS hose connectors for metal hoses or hose connectors 12 mm for rubber hoses. The sealings are resist up to 200°C.

The new 10 to 20 mm bottom valve does not only close almost deadvolume-free but ensures a residue-free discharge out of the valve room itself as well.

A compression spring absorbs the pressure caused by the heat extension of the valve spindle and readjusts the spindle automatically during cooling down. For problematic cases the valve can optionally be tempered or fitted with a peek spindle. Especially in case of emerging crystals it can be provided with Viton- or Kalrez O-ring.

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The rack components can be anodized aluminium with SS roods or complete SS.
Reaction system  6 - 20 Litres

The table rack based system is already fitted to cope with most of the problems occurring in laboratories. When manufactured in series it is already suited for pressures up to 0.5 bar and temperatures up to 200°C. Optionally it can be designed for temperatures of up to 300°C or pressures up to 2 bar. The expandable system enables almost all reaction system applications occurring within a laboratory.

A PFA coated anchor stirrer for high-viscous media as well as a reversal stirrer for low-viscous media are integrated in the system. For spare agitators or agitators made of stainless steel please see the list of spare parts or the catalogue.

<table>
<thead>
<tr>
<th>Capacity litres</th>
<th>Pressure max. bar</th>
<th>Necks at the Lid</th>
<th>Article Numbers DN 150</th>
<th>Article Numbers DN 200</th>
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<tbody>
<tr>
<td>5</td>
<td>0.5</td>
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<td>3505020200</td>
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<tr>
<td>10</td>
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<td>3510020200</td>
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<td>15</td>
<td>0.5</td>
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<tr>
<td>20</td>
<td>0.5</td>
<td>45 2 x 45 2 x 29</td>
<td>3520015200</td>
<td>3520020200</td>
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</table>

**Standard Equipment**
Glass reactor with death volume free, springloaded valve 20 mm, lid, O-ring made of seamless FEP coated silicone, ball beared mechanical seal, PFA coated SS anchor stirrer, PFA coated SS reversal stirrer, stirrer-motor coupling, stainless steel hose connectors to M16 x1, stainless steel frame with anodized aluminium connection parts including holder for the stirrer motor. Stainless steel holder for the reactors, manual, CE certificate.

**Optional Accessories**

**Hose connectors:**
- Hose connectors for hoses 10 mm
- Hose connectors for hoses 12 mm
- Hose connectors for hoses M 24 x 1.5
- Hose connectors for hoses M 30 x 1.5

**Valves:**
Larger valves: There are reactors with 16 mm, 20 mm and 25 mm valves available.
Valves for working with solid materials like crystals with O-ring made of viton or perfluorelastomere

- 20 mm tape with viton O-ring 1892004
- 20 mm tape with perfluorelastomere O-ring 1892003
- 25 mm tape with viton O-ring 1892504
- 25 mm tape with perfluorelastomere O-ring 1892503
- 20 mm 300° high temperature tapes with O-ring made of perfluorelastomere 1892002-316°
- 25 mm 300° high temperature tapes with O-ring made of perfluorelastomere 1892502-316°

**Motors:** electrical controled with digital display max. 500 rpm.
- SD 180 W 220 V 100 Ncm 4060217
- R100 C 300 W 220 V 150 Ncm and PC programm for remote controlling 4060218
- R100 CT 300 W 220 V 600 Ncm and PC programm for remote controlling 4060314
Synthese System DSS 10 HC

Standard Reactions System DSS 10 HC

The reaction system DSS 10 HC is available from 6 to 20 litre. Ass systems we offer with following applications:

- Double wall or triplex wall reactor
- Lid with connections for vapor, solid feed, temperature probe, dosing system and additional nozzles, for pH-probe useful.
- Powder dosing funnel
- Strong stirring motor, alo for less rpm
- DIEHM reversal stirrer for less viscous liquids and anchor stirrer for high viscous liquids.
- Stirrer material SS, PTFE-ceramic coated
- Drying working mechanical seal for a stabil vacuum less then 1 mbar
- Temperature probe with two sensors, variable in position and height adjustable, working as disturbingbuffer
- Reflux divider with enough cooling capacity
- Dosing vessel
- Phase separator
- 2 distillation vessels
- Overpressure device
- Vacuum divider with PTFE hoses and connections to exhaust and vent the separate system parts, with connection possibility to nitrogen
- Game system made of anodized aluminium frame parts and SS tubes for the complete system.
- Indication for 3 temperatures and pressure
- Integration possibility for an additional dosing vessel
- Temperature connections M 30 x 1,5
- Certification for all components

Wide x Depth x Height ~750 x 550 x 2100 -2400 mm

<table>
<thead>
<tr>
<th>Reactor</th>
<th>Feet</th>
<th>Receiver</th>
<th>Stirrer</th>
<th>cooler</th>
<th>Bottom-valve</th>
<th>Double wall Reaction Systems</th>
<th>Triplex wall Reaction Systems</th>
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<td>lit</td>
<td>Ø</td>
<td>m²</td>
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Spare reactors

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<th>Inhalt</th>
<th>Double wall Reactors</th>
<th>Triplex wall Reactors</th>
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<tr>
<td></td>
<td></td>
<td>ΔT 40K -100 to 230°C</td>
<td>ΔT 40K -20 to 60°C</td>
<td>ΔT 100K -100 to 230°C</td>
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<tr>
<td>200</td>
<td>6 Lit</td>
<td>3311153KF25V16</td>
<td>3320553KF25V16</td>
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<tr>
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<td>200</td>
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<td>3311187KF25V16</td>
<td>3320687KF25V20</td>
<td>3320687KF25V20</td>
</tr>
</tbody>
</table>

All reactors can be used in all systems, but it is to keep, that the used stirrers and sensors have the right length. We inform also, that all measurements can be larger as in this information.

Balance weight system for the reactors

Because of the large weight of the reactors is it problematical to disassemble the reactors for the cleaning. Therefore we suggest to use a lifting system with balance weights

Lift with balance weight 2 Kg for light reactors 91 450 34L01
additional weight 5 Kg for large reactors 91 450 34L02
additional weight 7 Kg for extra heavy reactors 91 450 34L03
Scrubber systems SC 001...020

Scrubber system to neutralize aggressive vapor
The systems are equipped with a spherical vessel 1...20 litre and specially for the laboratory designed.
The pump can be provided with a magnetic coupling or a mechanical seal.
The vessel has a GL 45 for filling and a valve 10 mm to empty the system.
A Bypass valve allows to adjust the pumping rate from 0 to 100%.
The system is assembled in a simple frame with SS bath

<table>
<thead>
<tr>
<th>Typ</th>
<th>Capacity</th>
<th>Column</th>
<th>Pump</th>
<th>Article No.</th>
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<td>20 L</td>
<td>100 x 900</td>
<td>magnetic seal</td>
<td>3901020032</td>
</tr>
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</table>

Larger systems up to 200 litre on request
Reaction system for laboratory use with double wall vessel 15 - 50 litres
**Reaction system, 15 - 50 litres for standard jobs**

This system is already fitted to cope with most of the problems occurring in laboratories. As standard it is already suited for pressures up to 0,5 bar and temperatures up to 200° C. Optionally it can be designed for temperatures of up to 300° C.

A PFA coated reversal stirrer for low-viscous media are integrated in the system. For spare agitators or agitators made of stainless steel please see the list of spare parts or the catalogue.

As option we deliver also Anchor stirrer or other special stirrers.

<table>
<thead>
<tr>
<th>Cap. litres</th>
<th>Press. max. bar</th>
<th>Lid Adapter</th>
<th>Article numbers</th>
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<td>0,5</td>
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<tr>
<td>50</td>
<td>0,5</td>
<td>KF 40</td>
<td>50</td>
</tr>
</tbody>
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**Standard Equipment**
Glass reactor with death volume free, springloaded valve 25 mm, lid, O-ring made of seamless FEP coated silicone, ball beared mechanical seal, PFA coated SS anchor stirrer, PFA coated SS reversal stirrer, stirrer-motor coupling, stainless steel hose connectors to M30 x1,5, stainless steel frame with anodized aluminium connection parts including holder for the stirrer motor. Stainless steel holder for the reactors, manual, CE certificate.

**Optional Accesories**

**Hose connectors:**
Optional we can provide the reactors with hose connections KF 15 instead of KF 25.

- Hose connectors KF 15 for hoses M 24 x 1,5: 188411524
- Hose connectors KF 15 for hoses M 30 x 1,5: 188411530
- Hose connectors KF 25 for hoses M 16 x 1: 188412516
- Hose connectors KF 25 for hoses M 24 x 1,5: 188412524

**Valves:**
Larger valves: There are reactors with 16 mm, 20 mm and 25 mm valves available.

Valves for working with solid materials like cristals with O-ring made of viton or perfluorelastomere

- 25 mm tape with viton O-ring: 1892504
- 25 mm tape with perfluorelastomere O-ring: 1892503
- 25 mm 300° high temperature tapes with O-ring made of perfluorelastomere: 1892002-316°
- 25 mm 300° high temperature tapes with O-ring made of perfluorelastomere: 1892502-316°

**Motors:**
electrical controled with digital display max. 500 rpm.

- R100 C 300 W 220 V 150 Ncm and PC programm for remote controlling: 4060218 *
- R100 CT 300 W 220 V 600 Ncm and PC programm for remote controlling: 4060314

*Only for the very less viscouse liquids strong enough