

Reaction apparatus with agitator and double wall vessel 0,1 - 5 litres

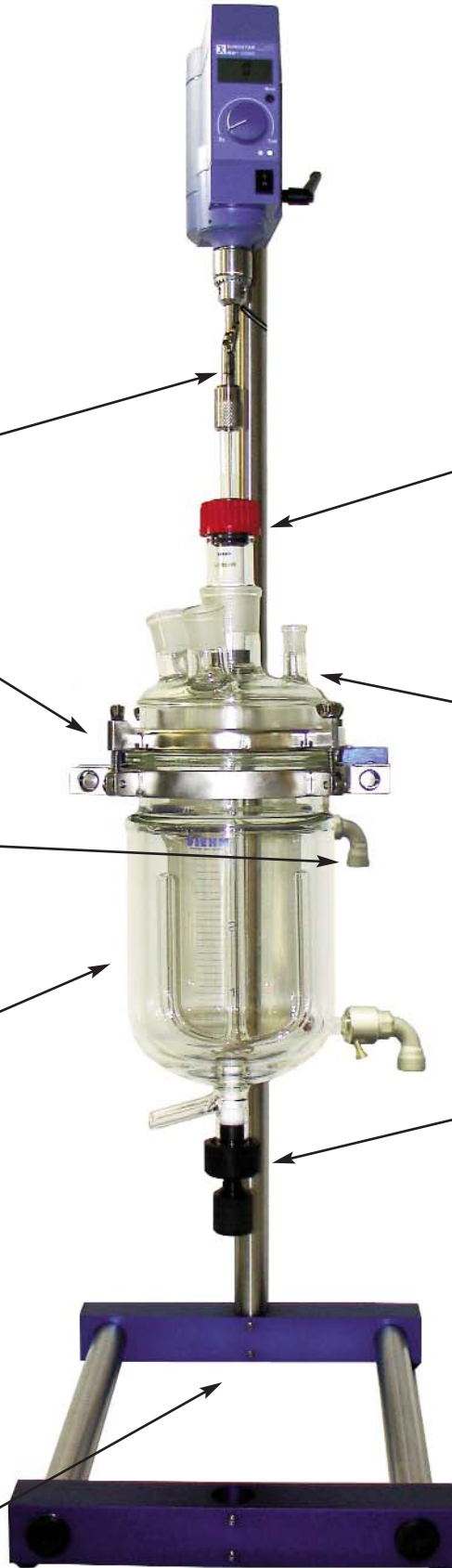
The double cardan coupling enables a tension-free drive of the agitator even in case of high speeds.

The polyester made seal, which can be used up to **200°C** allows for an easy dismantling of the system for cleaning.

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

When manufactured in series, the **fully vacuum compatible** double wall vessel is approved for pressures of up to 1 bar, however, it can be laid out for **higher pressures** as well. Moreover, the apparatus can be equipped with a **turbo tempering unit** ensuring a more steady and in the bottom area considerably improved tempering.

The rigid stainless steel pipe rack can be easily expanded or converted by means of universal coated aluminium-connecting components.



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

Optimally the cap can be provided with cuts and threads according to the **requirements of the customer**. Hence it can be adapted to all conditions of use.

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 manufactured to lock free of pressure. Especially in case of emerging crystals it can be provided with Viton- or Kalrez O-ring.

measurements:
350 x 500 x 1300 mm

Reaction system 0,1 - 5 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 1 bar and temperatures up to 200° C. Optionally it can be laid out for temperatures of up to 300° C or pressures up to 3 bar. The expandable system enables almost all reaction system applications occurring within a laboratory.

An anchor agitator for high-viscous media as well as a reversing agitator for low-viscous media are supplied as auxiliaries. For spare agitators or agitators made of stainless steel please see the list of spare parts or the catalogue. It is possible, of course, to monitor and to automate the system by means of the respective accessories.

Capacity Litres	max. bar	Cap Cuts			Purchase numbers			
		Mid sloped straight			DN 60	DN 100	DN 120	DN 150
0,1	1	29	2*14	1*14	35 001 60			
0,25	1	29	2*14	1*14	35 002 60			
0,5	1	29	2*14	1*14	35 005 60			
0,25	1	29	2*29	1*14		35 002 10		
0,5	1	29	2*29	1*14		35 005 10	35 005 12	
1,0	1	29	2*29	1*14		35 010 10	35 010 12	35 010 15
1,0	1	29	3*29	1*29		35 011 10	35 011 12	35 011 15
2,0	1	29	2*29	1*14		35 020 10	35 020 12	35 020 15
2,0	1	29	3*29	1*29		35 021 10	35 021 12	35 021 15
3,0	1	29	2*29	1*29		35 030 10	35 030 12	35 030 15
3,0	1	45	3*29	1*29		35 031 10	35 031 12	35 031 15
4,0	1	29	2*29	1*29		35 040 10	35 040 12	35 040 15
4,0	1	45	3*29	1*29		35 041 10	35 041 12	35 041 15
5,0	1	29	2*29	1*29			35 050 12	35 050 15
5,0	1	45	3*29	1*29			35 051 12	35 051 15

SS agitators

Art.no.

DN 60

DN 100

DN 120

DN 150

Anchor agitator, agitator lock NS 29	30 914 10 (Ltr) (DN)
Anchor agitator, agitator lock NS 45	30 914 15 (Ltr) (DN)
Reversing agitator, agitator lock NS 29	30 902 10 (Ltr) (DN)
Reversing agitator, agitator lock NS 45	30 902 16 (Ltr) (DN)
Blade agitator, agitator lock NS 29	30 915 10 (Ltr) (DN)
Blade agitator, agitator lock NS 45	30 915 16 (Ltr) (DN)

Flange connectors with insulated stainless steel hose

These hoses which fit to all commonly used laboratory thermostats are required for vessels with valve suitable for temperatures up to 300° C, because these vessels are provided with a flange for tempering purposes. All components needed for the connection are inclusive and laid out for temperatures up to 300° C.

Hose length 1,5 m, Connecting thread M 10*1,0 44 905 16/F/10

Hose length 1,5 m, Connecting thread M 16*1,0 44 905 16/F/16

Special valves

Tempered valve	18 901 22at
Valve for temperatures up to 300°C	18 901 26a
Valve for temperatures up to 300°C, tempered	18 901 26at
Valve for the use with solid materials, Viton seal	18 901 26acv
Valve for the use with solid materials, Kalrez seal, up to 300° C	18 901 26acv300

Standard reaction system DSS 01

We offer different sizes 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 nossle 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 viscouse 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 enough 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



Reactor DN	Reactor litre	feet ml	receiver ml	stirrer Ø	cooler m ²	bottom valve	Double wall reactorsystems		Triplex wall reactorsystems	
							ΔT 40K -90 to 180°C	ΔT 40K -20 to 60°C	ΔT 100K -90 to 180°C	
60	0,25	100	100	10	0,06	16 mm	3711100201	3711500201	3711600201	●
100	0,5	250	250	10	0,06	16 mm	3712100501	3712500501	3712600501	●
100	1,0	250	250	10	0,07	16 mm	3712101001	3712501001	3712601001	●
100	2,0	500	500	10	0,07	16 mm	3712102001	3712502001	3712602001	●
120	0,5	250	250	10	0,06	16 mm	3713100501	3713500501	3713600501	●
120	1,0	250	250	10	0,06	16 mm	3713101001	3713501001	3713601001	●
120	2,0	500	500	10	0,07	16 mm	3713102001	3713502001	3713602001	●
120	3,0	1000	1000	10	0,07	16 mm	3713103001	3713503001	3713603001	●
150	1,0	250	250	16	0,20	16 mm	3714101001	3714501001	3714601001	●
150	2,0	500	500	16	0,20	16 mm	3714102001	3714502001	3714602001	●
150	3,0	1000	1000	16	0,20	16 mm	3714103001	3714503001	3714603001	●
150	5,0	1000	1000	16	0,20	16 mm	3714105001	3714505001	3714605001	●

Spare reactors

DN	Capacity	Double wall reactors		Triplex reactors		Triplex reactors	
		ΔT 40K -100 to 230°		ΔT 40K -20 to 60°C		ΔT 100K -100 to 230°C	
●	60	250 ml	3311104KF15V16	3320504KF15V16	3320604KF15V16	●	
●	100	500 ml	3311110KF15V16	3320510KF15V16	3320610KF15V16	●	
●	100	1000 ml	3311113KF15V16	3320513KF15V16	3320613KF15V16	●	
●	100	2000 ml	3311118KF15V16	3320518KF15V16	3320618KF15V16	●	
●	120	500 ml	3311111KF15V16	3320511KF15V16	3320611KF15V16	●	
●	120	1000 ml	3311115KF15V16	3320515KF15V16	3320615KF15V16	●	
●	120	2000 ml	3311119KF15V16	3320519KF15V16	3320619KF15V16	●	
●	120	3000 ml	3311125KF15V16	3320525KF15V16	3320625KF15V16	●	
●	150	1000 ml	3311116KF15V16	3320516KF15V16	3320616KF15V16	●	
●	150	2000 ml	3311121KF15V16	3320521KF15V16	3320621KF15V16	●	
●	150	3000 ml	3311127KF15V16	3320527KF15V16	3320627KF15V16	●	
●	150	5000 ml	3311145KF15V16	3320545KF15V16	3320645KF15V16	●	

Second dosing or receiver sets

Capacity	Dosing set Complete with all holders and pipelines usefull for all systems	Receiver set Complete with all holders and pipelines usefull for all systems	Vacuum divider with additional pipelines and holders
100 ml	3700010100	3700020100	4 lines 3700040114
250 ml	3700010250	3700020250	
500 ml	3700010500	3700020500	5 lines 3700040115
1000 ml	3700011000	3700021000	
2000 ml	3700012000	3700022000	

Distillation sets

DN	Packed column set Complete with all holders				article no.	Phase divider set Complete with all holders and PTFE-pipelines
	column set	working length	additional frame tube length			
● 60	S 29	250 mm	0	3700030129	3700050022	●
● 100	S 29	250 mm	1800 mm	3700030229	3700050022	●
● 120	S 41	250 mm	1800 mm	3700030341	3700050022	●
● 150	S 41	250 mm	1800 mm	3700030441	3700050022	●

The distillation set is provided with a vacuum insolated collumn, rotulex ball connections. Below is a GL18 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

Reaction system with agitator motor and double wall vessel 6 - 20 litres

92

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 rods 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 metallhoses 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

measurements:
350 x 500 x 1300 mm

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 laid out for temperatures of up to 300° C or pressures up to 1 bar. The expandable system enables almost all reaction system applications occurring within a laboratory.

An anchor agitator for high-viscous media as well as a reversing agitator for low-viscous media are supplied as auxiliaries. For spare agitators or agitators made of stainless steel please see the list of spare parts or the catalogue.

It is possible, of course, to monitor and to automate the system by means of the respective accessories.

Vessels as of 15 litres are fitted with valves DN 25.

Capacity litres	Press. max. bar	Cap Cuts NS			Purchase numbers	
		Mid	sloped	straight	DN 150	DN 200
6	1,0	45	2*29	1*14	35 060 15	35 060 20
6	1,0	45	3*29	1*29	35 601 15	35 061 20
6	1,0	45	3*29	2*29		35 062 20
10	0,5	45	2*29	1*14	35 100 15	35 100 20
10	0,5	45	3*29	1*29	35 101 15	35 101 20
10	0,5	45	3*29	2*29	35 102 15	35 102 20
15	0,5	45	2*29	1*29	35 150 15	35 150 20
15	0,5	45	3*29	1*29	35 151 15	35 151 20
15	0,5	45	3*29	2*29	35 152 15	35 152 20
20	0,5	45	2*29	1*29	35 200 15	35 200 20
20	0,5	45	3*29	1*29	35 201 15	35 201 20
20	0,5	45	3*29	2*29	35 202 15	35 202 20

SS agitators

Purchase no.

DN 150 DN 200

Anchor agitator, agitator lock NS 45	30 914 15 (Ltr) (DN)
Reversing agitator, agitator lock NS 45	30 902 16 (Ltr) (DN)
Blade agitator, agitator lock NS 45	30 915 16 (Ltr) (DN)

Flange connectors with insulated stainless steel hose

These hoses which fit to all commonly used laboratory thermostats are required for vessels with valve suitable for temperatures up to 300° C, because these vessels are provided with a flange for tempering purposes. All components needed for the connection are inclusive and laid out for temperatures up to 300° C.

Hose length 1,5 m, Connecting thread M 10*1,0	44 905 16/F/10
Hose length 1,5 m, Connecting thread M 16*1,0	44 905 16/F/16

Special valves

6-10 Lit

15-20 Lit

Tempered valve	18 901 22at	18 901 32at
Valve for temperatures up to 300°C	18 901 26a	18 901 34a
Valve for temperatures up to 300°C tempered	18 901 26at	18 901 34at
Valve for the use with solid materials, Viton seal	18 901 26acv	18 901 34acv
Valve for the use with solid materials, Kalrez seal, up to 300°C	18 901 26acv300	18 901 34acv300

Synthese System DSS 10 HC

Standard Reactions System DSS 10 HC

The reaction system DSS 10 HC is available from 6 to 20 litre. As 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 nozzle, for pH-probe useful.
- Powder dosing funnel
- Strong stirring motor, also 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 stable vacuum less than 1 mbar
- Temperature probe with two sensors, variable in position and height adjustable, working as disturbing baffle
- 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
- Certifications for all components



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

Reactor DN	Reactor lit	Feet lit	Receiver lit	Stirrer Ø	Stirrer cooler m ²	Bottom-valvel	Double wall Reaction Systems		Triplex wall Reaction Systems	
							ΔT 40K -90 to 180°C	ΔT 100K -90 to 180°C	ΔT 40K -20 to 60°C	ΔT 100K -90 to 180°C
200	6	2	2	16	0,2	16 mm	3725106003	3725606003	3725506003	3725606003
200	10	5	5	16	0,3	16 mm	3725110003		3725610003	3725610003
100	15	5	5	16	0,6	16 mm	3725115003		3725615003	3725615003
100	20	5	5	16	0,6	16 mm	3725120003		3725620003	3725620003

Spare reactors

DN	Inhalt	Double wall Reactors ΔT 40K -100 to 230°		Triplex wall Reactors ΔT 40K -20 to 60°C		Triplex wall Reactors ΔT 100K -100 to 230°C	
200	6 Lit		3311153KF25V16		3320553KF25V16		3320653KF25V16
200	10 Lit		3311170KF25V20				3320670KF25V20
200	15 Lit		3311178KF25V20				3320678KF25V20
200	20 Lit		3311187KF25V16				3320687KF25V20

All reactors can be used in all systems, but it is to keep, that the used stirrers and sensors have the right length.

Es ist darauf zu achten, dass sich alle Abmaße hierdurch vergrößern.

Balance weight system for the reactors

Because of the large weight of the reactors it is 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
 additional weight 5 Kg for large reactors
 additional weight 7 Kg for extra heavy reactors

91 450 34L01
 91 450 34L02
 91 450 34L03

Reaction system for laboratory use with double wall vessel 15 - 30 litres



Reaction system, 15 - 30 litres for standard jobs

This system was especially slimmed down in the area of the cap and agitating mechanism and reconstructed to the standards of a laboratory. Its agitator's guidance consists of a simple laboratory agitator lock resting in PTFE. For easy completion the cap was provided with standard cuts. The zined 1" rack, however, provides a stable basis for the vessel and the agitator's motor.

The basic version of the system consists of a 15 litres vessel DN 200, a cap DN 200 with a med neck NS 45, three sloped side necks NS 29.2, and a straight side neck NS 29.2, a submerging pipe to accommodate a PT 100 sensor, a laboratory agitator lock, an stirrer motor with digital display, a 16 mm anchor agitator made of glass for high viscouse media as well as a reversing agitator made of glass for low-viscous media. The 25 mm bottom outlet valve is constructed in a way which prevents it from doing any harm to the glass component even in case of extreme heat expansion and high pressure load.

Capac.	Astr.itinstr. motor	Lid		Art.no.
		DN	NS	
15 Lit.	CAT R 100 SD	200	M45 1*45angled 2*29angled 1*29str.	36 150 21
15 Lit.	CAT R 100 C	200	M45 1*45angled 2*29angled 1*29str.	36 151 21
15 Lit.	CAT R 100 CT	200	M45 1*45angled 2*29angled 1*29str.	36 152 21
20 Lit.	CAT R 100 SD	200	M45 1*45angled 2*29angled 1*29str.	36 200 21
20 Lit.	CAT R 100 C	200	M45 1*45angled 2*29angled 1*29str.	36 201 21
20 Lit.	CAT R 100 CT	200	M45 1*45angled 2*29angled 1*29str.	36 202 21
20 Lit.	CAT R 100 SD	300	M45 1*45angled 3*29angled 2*29str.	36 203 30
20 Lit.	CAT R 100 C	300	M45 1*45angled 3*29angled 2*29str.	36 204 30
20 Lit.	CAT R 100 CT	300	M45 1*45angled 3*29angled 2*29str.	36 205 30
30 Lit.	CAT R 100 SD	200	M45 1*45angled 2*29angled 1*29str.	36 300 21
30 Lit.	CAT R 100 C	200	M45 1*45angled 2*29angled 1*29str.	36 301 21
30 Lit.	CAT R 100 CT	200	M45 1*45angled 2*29angled 1*29str.	36 302 21
30 Lit.	CAT R 100 SD	300	M45 1*45angled 3*29angled 2*29str.	36 303 30
30 Lit.	CAT R 100 C	300	M45 1*45angled 3*29angled 2*29str.	36 304 30
30 Lit.	CAT R 100 CT	300	M45 1*45angled 3*29angled 2*29str.	36 305 30

Access.	Vessel size	15L	20L	30L
Stainless steel agitators				
Anchor agitator		30 914 35 /15 (DN)	30 914 35 /20 (DN)	30 914 35 /30 (DN)
Reversing agitator		30 902 16 /15 (DN)	30 902 16 /20 (DN)	30 902 16 /30 (DN)
Blade agitator		30 915 16 /15 (DN)	30 915 16 /15 (DN)	30 915 16 /15 (DN)
Agitator baffle probes with PT 100 sensors		19 001 15PT	19 001 20PT	19 001 30PT
Thermostat, 3 kW, digital		44 000 67	44 000 67	44 000 67