

# 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 transference.

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.

Optionally 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.

## 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 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		Lid adapter			Article numbers			
Litres	max. bar	Necks (NS)			DN 60	DN 100	DN 120	DN 150
		center	15° angled	vertical				
0,1	0,2	14	2 x 14 1 x 19	1 x 14	3500160100			
0,25	0,2	14	2 x 14 1 x 19	1 x 14	3500260100			
0,5	0,2	14	2 x 14 1 x 19	1 x 14	3500560100			
0,25	0,2	29	3 x 29	1 x 19		3500210100		
0,5	0,2	29	3 x 29	1 x 19		3500510100		
1,0	0,2	29	3 x 29	1 x 19		3501010100		
2,0	0,2	29	3 x 29	1 x 19		3502010100		
0,5	0,2	29	3 x 29	1 x 29			3500512100	
1,0	0,2	29	3 x 29	1 x 29			3501012100	3501015100
2,0	0,2	29	3 x 29	1 x 29			3502012100	3502015100
3,0	0,2	29	3 x 29	1 x 29			3503012100	3503015100
4,0	0,2	29	3 x 29	1 x 29			3504012100	3504015100
5,0	0,2	29	3 x 29	1 x 29			3505012100	3505015100

## 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.

## Optioal Accesories

### 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.

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

10 mm tape with viton O-ring	1891004
10 mm tape with perfluorelastomere O-ring	1891003
16 mm tape with viton O-ring	1891604
16 mm tape with perfluorelastomere O-ring	1891603
20 mm tape with viton O-ring	1892004
20 mm tape with perfluorelastomere O-ring	1892003
20 mm tape with viton O-ring	1892504
20 mm tape with perfluorelastomere O-ring	1892503
10 mm 300° high temperature tapes with O-ring made of perfluorelastomere	1891002-316°
16 mm 300° high temperature tapes with O-ring made of perfluorelastomere	1891602-316°
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.

R50 D 50 W 220 V 0,3 Nm	4060216
R80 D 80 W 220 V 0,8 Nm	40603R8012
R80 D PC 80 W 220 V 0,8 Nm with RS 232 and PC program for remute controlling	40603R8013
SD 180 W 220 V 100 Ncm	4060217
R100 C 300 W 220 V 150 Ncm and PC program for remute controlling	4060218
R100 CT 300 W 220 V 600 Ncm and PC program for remute controlling	4060314



## 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 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

Reactor DN	litre	feet ml	receiver ml	stirrer Ø	cooler m²	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				Phase divider set Complete with all holders and PTFE-pipelines
	column set	working length	additional frame tube length	article no.	
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 insulated column, 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

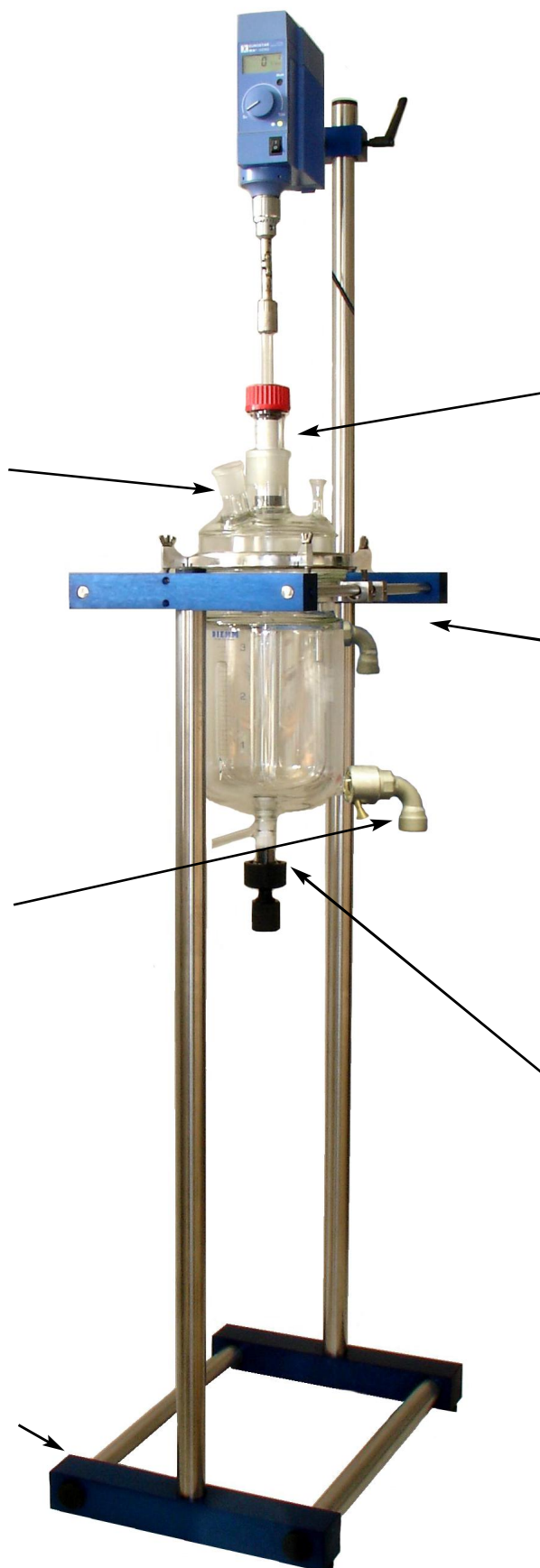
92

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 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 litres	Pressure max. bar	Necks at the Lid			Article Numbers	
		NS			DN 150	DN 200
		center	15° angled	vertical		
5	0,5	45	2 x 45	2 x 29	3505015200	3505020200
6	0,5	45	2 x 45	2 x 29	3506015200	3506020200
10	0,5	45	2 x 45	2 x 29	3510015200	3510020200
15	0,5	45	2 x 45	2 x 29	3515015200	3515020200
20	0,5	45	2 x 45	2 x 29	3520015200	3520020200

## 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 Accesories

### 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.

Valves for working with solid materials like cristals 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 remute controlling	4060218
R100 CT 300 W 220 V 600 Ncm and PC programm for remute 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 nossle, for pH-probe useful.
- Powder dosing funnel
- Strong stirring motor, alo for less rpm
- DIEHM reversal stirrer for less viscouse 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 disturbingbuffle
- Reflux divider with enought cooling capacity
- Dosing vessel
- Phase separator
- 2 distillation vessels
- Overpressure device
- Vakuum 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 presure
- Integration posibility for a 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	lit	Feet lit	Receiver lit	Stirrer Ø	cooler m²	Bottom- valvel	Double wall Reaction Systems	Triplex wall Reaction Systems	
							ΔT 40K -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	3725506003	3725606003
200	10	5	5	16	0,3	16 mm	3725110003		3725610003
100	15	5	5	16	0,6	16 mm	3725115003		3725615003
100	20	5	5	16	0,6	16 mm	3725120003		3725620003

#### Spare reactors

DN	Inhalt	Double wall Reactors	Triplex wall Reactors	Triplex wall Reactors
		ΔT 40K -100 to 230°	ΔT 40K -20 to 60°C	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. 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 diasemble the reactors for the cleaning There for we suggest to use a lifting system with balance weights

Lift with balance weight 2 Kg for light reactos  
additional weight 5 Kg for large reactors  
additional weight 7 Kg for extra heavy reactors

91 450 34L01  
91 450 34L02  
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

Typ	Capacity	Column	Pump	Article No.
SC 001	1 L	40 x 500	mechanical seal	3901001031
SC 001M	1 L	40 x 500	magnetic seal	3901001032
SC 002	2 L	40 x 500	mechanical seal	3901002031
SC 002M	2 L	50 x 500	magnetic seal	3901002032
SC 005	5 L	40 x 500	mechanical seal	3901004031
SC 005M	5 L	40 x 500	magnetic seal	3901004032
SC 010	10 L	80 x 800	mechanical seal	3901010031
SC 010M	10 L	80 x 800	magnetic seal	3901010032
SC 020	20 L	100 x 900	mechanical seal	3901020031
SC 020M	20 L	100 x 900	magnetic seal	3901020032

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.

Cap. litres	Press. max. bar	Lid Adapter Necks			Article numbers	
		center	angled	vertical	DN 200	DN 300
15	0,5	NS 45	2 x NS 45, 2 x NS 29	1 x NS 29	3505015200	
20	0,5	NS 45	2 x NS 45, 2 x NS 29	1 x NS 29	3506020200	
20	0,5	KF 40	1 x NS 45, 1 x LF 100	2 x NS 29, 1 x KF 40		3506020300
30	0,5	NS 45	2 x NS 45, 2 x NS 29	1 x NS 29	3506030200	
30	0,5	KF 40	1 x NS 45, 1 x LF 100	2 x NS 29, 1 x KF 40		3506030300
40	0,5	KF 40	1 x NS 45, 1 x LF 100	2 x NS 29, 1 x KF 40		3506040300
50	0,5	KF 40	1 x NS 45, 1 x LF 100	2 x NS 29, 1 x KF 40		3506050300

## 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 controlled with digital display max. 500 rpm.

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

\*Only for the very less viecouse liquids strong enough