



12 Chemtron Reaction Solutions

Bench Top Glass Reactors

All-in-one series

Chemtron reactor kits are selected by volume and comprise the basic components required for startup. For a complete application solution Chemtron is proud to offer a full range of glassware, accessories, and temperature control equipment to compliment our reactor kits.

Reactor kits include the following components:

- > Support Stand
- > Vessel with JRS Valve™
- > Shaft and agitator(s)
- > Bearing
- > Lid with clamp and o-ring
- > Overhead stirrer with shaft couplings
- > Spiral Condenser
- > Jacket adapters
- > RTD probe adapter



Specifications

Model		BTG250	BTG500	BTG1000	BTG2000	BTG5000
Reaction vessel	Material	Borosilicate glass				
	Volume	250ml	500ml	1000ml	2000ml	5000ml
	Flange	60mm	100mm	100mm	100mm	150mm
	Bottom valve	Temperature range: -80~200°C, 10mm and 20mm are optional				
	Jacket connection	DN15	DN15	DN15	DN15	DN15
Lid	Material	Borosilicate glass				
	Ports (total)	5	5	5	5	5
	Center port	24/40(1)	24/40(1)	24/40(1)	24/40(1)	24/40(1)
	Side port	14/20(3)	24/40(3)	24/40(3)	24/40(3)	24/40(3)
O-ring	Addition port	24/40(1)	GL45(1)	GL45(1)	GL45(1)	GL45(1)
	PTFE, 60mm	PTFE, 100mm	PTFE, 100mm	PTFE, 100mm	PTFE, 100mm	PTFE, 150mm
Stirrer	Stirring speed range	20~2000rpm				
	Bearing	PTFE stirring bearing				
Addition Funnel	Volume	60ml	125ml	125ml	125ml	500ml
	Port	24/40	24/40	24/40	24/40	24/40
Condenser	Length	300mm	300mm	300mm	300mm	300mm
	Port	24/40	24/40	24/40	24/40	24/40
Receiving Vessel	Volume	50ml	200ml	500ml	500ml	500ml
Multi channel regulating valve	Optional	Optional	Optional	Optional	Optional	Optional
Stand	Smart supporting structure					
Spill containment tray	Included	Included	Included	Included	Included	Included

1. Single-layer reactor, double-jacket reactor are also available
2. JULABO temperature control system is recommended
3. WIGGENS auto reaction system is recommended (ReactROL)

Large Scale Glass Reactors

EasyChem series

10L, 20L, 30L, 50L and 100L EasyChem reactor. Designed for maximum diversity and ease of use, we have developed a simple base system building platform which allows any reactor system to be customized using catalog or custom designed parts. Each base system comes with the basic starting components required. Simply select the motor and accessories needed to complete the design. For customized components or application design, contact our technical department for further assistance.

1. Select the base system dependent on desired working volume.
2. Select the motor that best suits your application.
3. Select the components and accessories which best fit your application.



Specifications

Model		SPG10	SPG20	SPG30	SPG50	SPG51	SPG100
Reaction vessels	Material	Borosilicate glass					
	Volume	10L	20L	30L	50L	50L	100L
	Flange	DN200	DN300	DN300	DN300	DN400	DN400
	Bottom valve	DN50, dead volume					
	Jacket connection	DN15(2)	N25(2)	N25(2)	N25(2)	N25(2)	N25(2)
Lids	Material	Borosilicate glass					
	Ports (total)	5	8	8	8	8	8
	Center port	45/50	45/50	45/50	45/50	45/50	45/50
	Addition port	60mm	100mm	100mm	100mm	100mm	100mm
O-rings	Side port	45/50(3)	45/50(4)	45/50(4)	45/50(4)	45/50(4)	45/50(4)
	Material	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE
	Diameter	DN200	DN300	DN300	DN300	DN400	DN400
Stirrers	Stirring speed range	20~1800rpm					
	Bearing	PTFE stirring bearing					
Addition Funnels	Volume	2L	2L	2L	5L	5L	5L
	Port	29/42	29/42	29/42	45/50	45/50	45/50
Condensers	Cooling surface	1400cm ²	1400cm ²	1400cm ²	1400cm ²	1400cm ²	1400cm ²
	Port	45/50	45/50	45/50	45/50	45/50	45/50
Receiving Vessel	Volume	2L	2L	2L	5L	5L	5L
Multi channel regulating valve	Optional	Optional	Optional	Optional	Optional	Optional	Optional
Stand	Smart supporting structure						
Spill containment tray	Included	Included	Included	Included	Included	Included	Included

1. JULABO temperature control system is recommended

2. WIGGENS auto reaction system is recommended (ReactROL)

Large Scale Glass Reactors

Plus series

Pilot plant for high performance applications scaling up to the kilolab

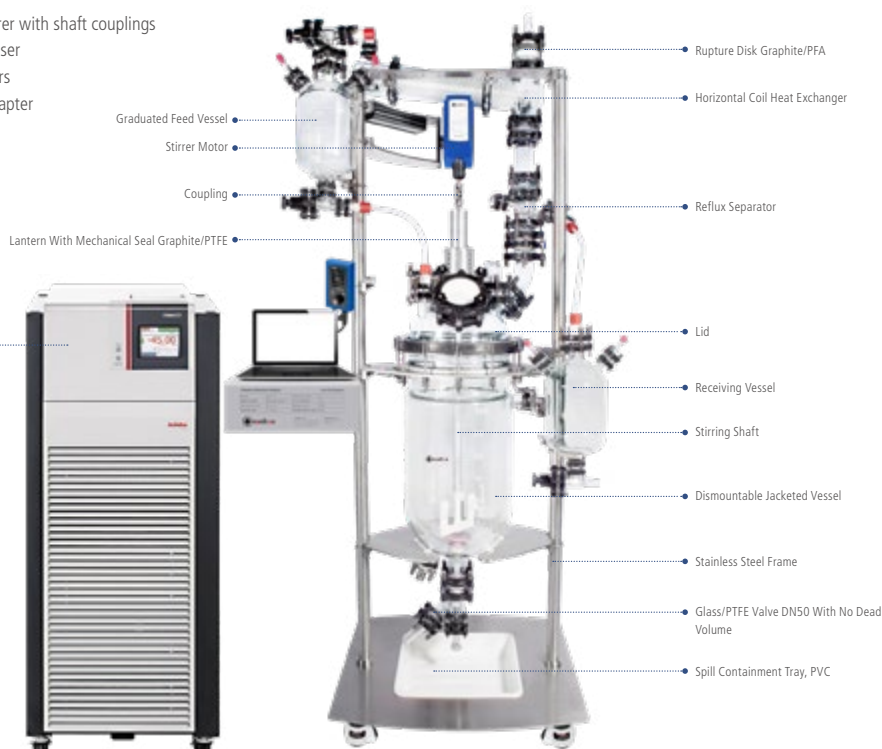
- > Wiggins offers a wide range of pilot plants for research and production, the system are modular, flexible, user-friendly and can be integrated anytime with various accessories.
- > Easily configurable range of pilot plant from 10L to 100L of total volume.
- > Wiggins unique open air, auto-centered frame made of AISI 316 stainless steel allow the expansion of the basic configuration.

Reactor kits include the following components:

- > Support Stand
- > Vessel with KF-50 drain valve
- > Shaft and agitator(s)
- > Bearing
- > Lid with clamp and o-ring
- > Overhead stirrer with shaft couplings
- > Spiral Condenser
- > Jacket adapters
- > RTD probe adapter

Heating/Cooling Circulator needed?

- > If so, what capacity?
- > If so, what temperature range?
- > If so, what time to temperature?
- > If so, is your reaction exothermic?



Specifications

Model		PPG10	PPG20	PPG30	PPG50	PPG51	PPG52	PPG100	PPG102
Reaction vessels	Material	Borosilicate glass							
	Volume	10L	20L	30L	50L	50L	50L	100L	100L
	Flange	DN300	DN300	DN300	DN300	DN400	DN450	DN400	DN450
	Bottom valve	DN50, dead volume							
	Jacket connection	DN25(2)							
Lids	Material	Borosilicate glass							
	Ports (total)	7	7	7	7	7	7	7	7
	Center port	DN50	DN50	DN50	DN50	DN50	DN50	DN50	DN50
	Addition port	DN80	DN80	DN80	DN80	DN80	DN80	DN80	DN80
	Condenser port	DN50	DN50	DN50	DN80	DN80	DN80	DN80	DN80
O-rings	Material	PTFE							
	Diameter	DN300	DN300	DN300	DN300	DN400	DN450	DN400	DN450
Stirrers	Stirring speed range	20~1800rpm							
	Bearing	PTFE stirring bearing							
Addition Funnels	Volume	5L	5L	5L	10L	10L	10L	10L	10L
Condensers	Cooling surface	0.6m ²	0.6m ²	0.6m ²	0.75m ²	0.75m ²	0.75m ²	0.75m ²	0.75m ²
	Port	DN50	DN50	DN50	DN80	DN80	DN80	DN80	DN80
Receiving Vessel	Volume	2L	2L	2L	5L	5L	5L	5L	5L
Multi channel regulating valve	Optional	Optional	Optional	Optional	Optional	Optional	Optional	Optional	Optional
Stand	Smart supporting structure								
Spill containment tray	Included	Included	Included	Included	Included	Included	Included	Included	Included

1. JULABO temperature control system is recommended

2. WIGGENS auto reaction system is recommended (ReactROL)

S.S. High Pressure Reactors

CR-300 | CR-500 | CR-1000 | CR-2000 (Up to 100bar)

This high-pressure reactor is ideally suitable for universal experimental runs. This high-pressure reactor is available in stainless steel with or with bottom outlet. The usable volume of the reactor can be varied between 300 ml and 2,000 ml using different reactor vessels.

The CR-300/500/1000/2000 high-pressure reactor is notable for its ease of handling. The reactor is closed using a manual quick closure that can be attached without the use of tools. The reactor seal is established using a conical flange lock and O-ring seal of PTFE, FKM, or FFKM. The appropriate fitting inserts are available in stainless steel. A total of 6 connection options are provided in the lid, which can be selected from the following:

- > Immersion tube for temperature probes
- > Rupture disc of metal for the safe limitation of maximum pressure
- > Pressure display
- > Vent valve
- > 2 Freely selectable fittings, for example for a gas sampling valve or liquid sampling point

Temperature is regulated using a temperature probe which detects the inner temperature of the reactor in an immersion tube. A second temperature probe can optionally be used as an independent overheating safety. Appropriate stand systems are available.

Features

- > 300, 500, 1000 or 2000 ml / 60 bar / 300°C
- > Quick closure chain, to be operated manually without tools
- > O-seal ring made of Viton®, PTFE or Kalrez®
- > Completely made of SUS 316L
- > Heating by electrical or thermostated mantle
- > Stirring by magnetic clutch and separate drive
- > Optionally internal heating/cooling coil
- > Optionally 2'nd thermocouple



CR-300 / 500

CR-1000 / 2000

Technical Specification

	CR-300	CR-500	CR-1000	CR-2000	
Temperature max.	300°C	300°C	300°C	300°C	
Pressure max.	100 bar	100 bar	100 bar	100 bar	
Reactor Vessel	Volume	approx. 300 ml	approx. 500 ml	approx. 1,000 ml	approx. 2,000 ml
	Inner Diameter	68 mm	68 mm	90 mm	90mm
	Inner Height	108 mm	175 mm	193 mm	352 mm
	Weight	approx 4 kg	approx 6 kg	approx 11 kg	approx. 16 kg
	Bottom Drain Valve	with bottom drain valve	with bottom drain valve	with bottom drain valve	with bottom drain valve
Armatures	Standard Armatures	Rupture Disc, Dip Tube, Valve, Tool			
	Pressure Measurement	analog and/or digital			
	Ports (total)	7	7	7	7
	Ports (free)	3	3	3	3
	Type of connection	8 mm Tube Connection	8 mm Tube Connection	8 mm Tube Connection	8 mm Tube Connection
Heating Systems	Via Fluid	with jacket	with jacket	with jacket	with jacket
	Via Fluid (Heating Coil, optional)	Heating coil	Heating coil	Heating coil	Heating coil
Stirring	WB20C and RV 100-SS	WB20C and RV 100-SS	WB20C and RV 100-SS	WB20C and RV 100-SS	
Stand	Electric bench-top stand	Electric bench-top stand	Electric lifting stand	Electric lifting stand	

S.S. Low Pressure Reactor

NR-500 | NR-1000 | NR-2000 (Up to 25bar)

This low-pressure reactor is ideally suitable for larger experimental runs. This low-pressure reactor is available in stainless steel, Hastelloy, or with PTFE lining on all sides. The usable volume of the reactor can be varied between 500ml, 1,000ml and 2,000 ml using different reactor vessels.

The NR-500/1000/2000 low-pressure reactor is notable for its ease of handling. The reactor is closed using a manual quick closure that can be attached without the use of tools. The reactor seal is established using a conical flange lock and O-ring seal of PTFE, FKM, or FFKM. The appropriate fitting inserts are available in stainless steel or Hastelloy. A total of 7 connection options are provided in the lid, which can be selected from the following:

- > Gas sampling
- > Rupture disc of metal for the safe limitation of maximum pressure
- > Pressure display
- > Vent valve
- > Dip-tube liquid sampling
- > Thermocouple with dip-tube
- > Exhaust hose

Temperature is regulated using a temperature probe which detects the inner temperature of the reactor in an immersion tube. A second temperature probe can optionally be used as an independent overheating safety. Appropriate stand systems are available.

Features

- > 500,1000 or 2000 ml / 25 bar / 300°C (PTFE-Lined 230°)
- > With or without bottom drain valve
- > Quick closure chain, to be operated manually without tools
- > O-seal ring made of Viton®, PTFE or Kalrez®
- > Either with PTFE-insert or completely made of SUS 316L or Hastelloy®
- > Heating by electrical or thermostated mantle
- > Stirring by magnetic clutch and separate drive
- > Optionally internal heating/cooling coil



M1

M2

Technical Specification

		NR-500	NR-1000	NR-2000
Performance and Material	Material	Stainless Steel or Hastelloy		
	Temperature max.	300°C	300°C	300°C
	Pressure max.	25 bar	25 bar	25 bar
Reactor Vessel	Volume	approx. 500 ml	approx. 1,000 ml	approx. 2,000 ml
	Inner Diameter	83 mm	96 mm	127 mm
	Inner Height	80 mm	120 mm	150 mm
	Weight	approx 3.7 kg	approx 5.7 kg	approx. 8.1 kg
	Bottom Drain Valve	✓	✓	✓
TFMTM-PTFE Insert		optional	optional	optional
Armatures	Standard Armatures	Rupture Disc, Dip Tube, Valve, Tool		
	Pressure Measurement	analog and/or digital		
	Ports (total)	7	7	7
	Ports (free)	3	3	3
	Type of connection	8 mm Tube Connection	8 mm Tube Connection	8 mm Tube Connection
Heating Systems	Via Fluid	with jacket	with jacket	with jacket
	Via Fluid (Heating Coil, optional)	Heating coil	Heating coil	Heating coil
Stirring		WB20C and RV 100-SS	WB20C and RV 100-SS	WB20C and RV 100-SS
Stand		Electric bench-top stand (M1 and M2)	Electric bench-top stand (M1 and M2)	Electric bench-top stand (M1 and M2)
		Electric lifting stand (M3)	Electric lifting stand (M3)	Electric lifting stand (M3)

S.S. Low Pressure Reactor

NR-5L | NR-10L (Up to 25bar)

This low-pressure reactor is ideally suitable for larger experimental runs. This low-pressure reactor is available in stainless steel, Hastelloy, or with PTFE lining on all sides. The usable volume of the reactor can be varied between 5L and 10L using different reactor vessels.

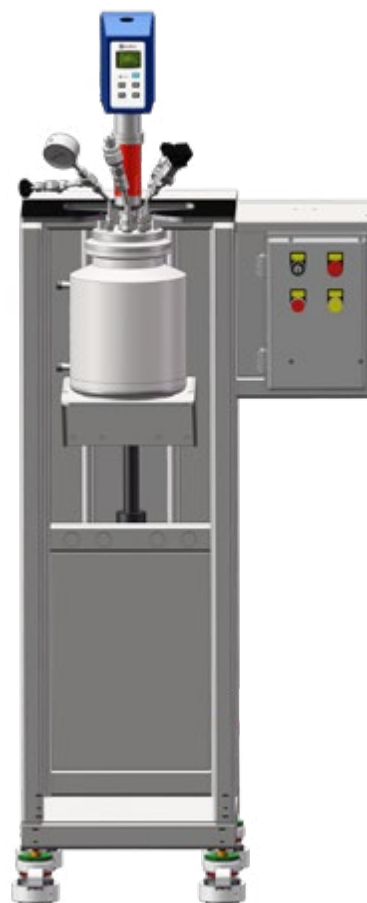
The NR-5L/10L low-pressure reactor is notable for its ease of handling. The reactor is closed using a manual quick closure that can be attached without the use of tools. The reactor seal is established using a conical flange lock and O-ring seal of PTFE, FKM, or FFKM. The appropriate fitting inserts are available in stainless steel or Hastelloy. A total of 7 connection options are provided in the lid, which can be selected from the following:

- > Gas sampling
- > Rupture disc of metal for the safe limitation of maximum pressure
- > Pressure display
- > Vent valve
- > Dip-tube liquid sampling
- > Thermocouple with dip-tube
- > Exhaust hose

Temperature is regulated using a temperature probe which detects the inner temperature of the reactor in an immersion tube. A second temperature probe can optionally be used as an independent overheating safety. Appropriate stand systems are available.

Features

- > 5L or 10L / 25 bar / 300°C (PTFE-Lined 230°)
- > With or without bottom drain valve
- > Quick closure chain, to be operated manually without tools
- > O-seal ring made of Viton®, PTFE or Kalrez®
- > Either with PTFE-insert or completely made of SUS 316L or Hastelloy®
- > Heating by electrical or thermostated mantle
- > Stirring by magnetic clutch and separate drive
- > Optionally internal heating/cooling coil



Technical Specification

		NR-5L	NR-10L
Performance and Material	Material	Stainless Steel or Hastelloy	
	Temperature max.	300°C	300°C
	Pressure max.	25 bar	25 bar
Reactor Vessel	Volumen	approx. 5000 ml	approx. 10L
	Innendurchmesser	195 mm	195 mm
	Innenhöhe	239 mm	394 mm
	Gewicht	approx. 16,4 kg	approx. 20 kg
	Bodenablassventil	✓	✓
TFMTM-PTFE Insert		optional	optional
Armatures	Standard Armatures	Rupture Disc, Dip Tube, Valve, Tool	
	Pressure Measurement	analog and/or digital	
	Ports (total)	8	8
	Ports (free)	4	4
	Type of connection	8 mm Tube Connection	8 mm Tube Connection
Heating Systems(optional)	Via Fluid	with jacket	with jacket
	Via Fluid (Heating Coil, optional)	Heating coil	Heating coil
Stirring	RV-100	WB18D and RV 100-SS	WB18D and RV 100-SS
	RV-400	WB18D and RV 400-SS	WB18D and RV 400-SS
Stand		Electric lifting stand	Electric lifting stand

S.S. Low Pressure Reactor

NR-20L | NR-30L | NR-50L (Up to 25bar)

This low-pressure reactor is ideally suitable for larger experimental runs. This low-pressure reactor is available in stainless steel. The usable volume of the reactor can be varied 20L, 30L and 50L using different reactor vessels.

The NR-20L/30L/50L low-pressure reactor is notable for its ease of handling. The reactor is closed using a quick closure. The reactor seal is established using a conical flange lock and O-ring seal of PTFE, FKM, or FFKM. The appropriate fitting inserts are available in stainless steel. A total of 7 connection options are provided in the lid, which can be selected from the following:

- > Gas sampling
- > Rupture disc of metal for the safe limitation of maximum pressure
- > Pressure display
- > Vent valve
- > Dip-tube liquid sampling
- > Thermocouple with dip-tube
- > Exhaust hose

Temperature is regulated using a temperature probe which detects the inner temperature of the reactor in an immersion tube. A second temperature probe can optionally be used as an independent overheating safety. Appropriate stand systems are available.



Features

- > 20L, 30L or 50L / 20 bar / 250°C
- > With bottom drain valve
- > Quick closure chain
- > O-seal ring made of Viton®, PTFE or Kalrez®
- > Temperature controlled by heating and cooling circulators from JULABO
- > Stirring by magnetic clutch and separate drive

Technical Specification

		NR-20L	NR-30L	NR-50L
Performance and Material	Material	Stainless Steel		
	Temperature max.	250°C	250°C	250°C
	Pressure max.	20bar	20bar	20bar
	Volume	20L	30L	50L
	Inner diameter	250mm	312mm	265mm
Reactor vessel	Inner height	557mm	550mm	737mm
	Bottom drain valve	✓	✓	✓
	With jacket	✓	✓	✓
	Max. pressure on jacket	3bar	3bar	3bar
	Volume of jacket	≈5.3L	≈15.8L	≈20.0L
Seal ring	Viton	✓	✓	✓
Armatures	Standard armatures	Rupture disc., Pressure gauge, Pt-sensor and gas valve		
	Pressure measurement	Analog and/or Digital		
	Ports (total)	7	7	7
	Type of connection	8mm tube connection		
Heating Systems	Double jacket (JULABO unit)	✓	✓	✓
Stirring (Magnetic clutch)	RV-400	✓	✓	✓

* The number of free ports can be enlarged by the use of T-connections

** When using PTFE inserts the maximum allowable temperature is 230°C

S.S. Reactor

VR-500 | VR-1000 | VR-2000 | VR-5000 (-1~5bar)

Bench top reactors are ideally suitable for small experimental runs. This series reactor is available in stainless steel, with or without jacket, The usable volume of the reactor can be varied between 500 ml and 5,000 ml using different reactor vessels.

The VR-500/1000/2000/5000 reactor are notable for its ease of handling. The reactor is closed using a manual quick closure. The reactor seal is established using a conical flange lock and O-ring seal of PTFE, FKM, or FFKM. The appropriate fitting inserts are available in stainless steel. A total of 5 connection options are provided in the lid from VR-500 to VR-2000, VR-5000 has 7 connecting options.



M1



M2



M3

Features

- > 500, 1000, 2000 or 5000 ml / 5 bar / 200°C
- > With or without jacket, with or without bottom outlet
- > Quick closure chain design
- > O-seal ring made of PTFE, Viton or FFKM
- > Heating by electrical or thermostated mantle
- > Stirring by overhead stirrer
- > Optionally internal heating/cooling coil

Technical Specification

Model	VR-500	VR-1000	VR-2000	VR-5000
Performance and Material	Material	316L S.S.	316L S.S.	316L S.S.
	Max. Temperature	300°C	300°C	300°C
	Max. Pressure	≤5bar	≤5bar	≤5bar
Jacketed vessel	Volume	500ml	1000ml	2000ml
	Flange	DN89	DN102	DN133
	Inner Dia.	83mm	96mm	127mm
	Inner Height	80mm	120mm	150mm
O-ring	Material	PTFE (Viton, FFKM for optional)		
	Size	89mm	102mm	133mm
Lids	Flange	DN89	DN102	DN133
	Center Ports	M38X2	M38X2	M38X2
	Other ports	1/4" and 1/2" NPT		
Heating unit (Optional)	JULABO unit	Yes		
	Type of sealling	Double mechanical seal		
Stir	Motor	Overhead stirring motor		
	Speed	20~1800rpm(Other model for optional)		
	Type	SS Frame		
Frame	Size	600*360/700mm(L*W*H)		
	Liquid receiving tray	Stainless steel		

Large Scale S.S. Reactors

VR-10L | VR-20L | VR-30L | VR-50L (-1~5bar)

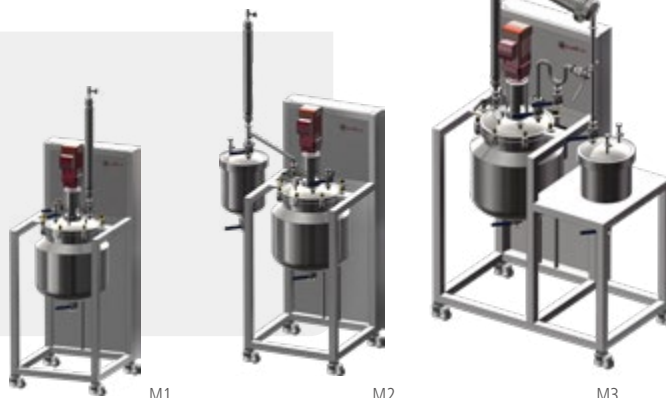
Pilot Plant are ideally suitable for big volume experimental runs. This series reactor is available in stainless steel, with or without jacket, The usable volume of the reactor can be varied between 10L and 50L using different reactor vessels.

The VR-10L/20L/30L/50L reactor are notable for its ease of handling. The reactor is closed using a manual quick closure. The reactor seal is established using a conical flange lock and O-ring seal of PTFE, Silicon or Viton. The appropriate fitting inserts are available in stainless steel. A total of 7 connection options are provided in the lid from VR-10L to VR-50L



Features

- > 10, 20, 30 or 50L / 5 bar / 200°C
- > The vessel with jacket and bottom outlet
- > Strong device is used to fix the reaction vessel and lid
- > O-seal ring made of PTFE, Silicon or Viton
- > Temperature control by heating and cooling circulator, such as JULABO unit
- > Stirring by overhead stirrer
- > Optionally internal heating/cooling coil
- > With distillation unit and Receiver



Technical Specification

Model		VR-10L	VR-20L	VR-30L	VR-50L
Performance and Material	Material	316L S.S.	316L S.S.	316L S.S.	316L S.S.
	Max. Temperature	300°C	300°C	300°C	300°C
	Max. Pressure	≤5bar	≤5bar	≤5bar	≤5bar
	Volume	10L	20L	30L	50L
Jacketed vessel	Inner Dia.	250mm	300mm	350mm	400mm
	Inner Height	250mm	300mm	300mm	350mm
	Thickness	4mm	4mm	4mm	4mm
	Material	PTFE (Viton, FFKM for optional)			
O-ring	Size	283mm	333mm	383mm	433mm
	O.D.	300mm	350mm	400mm	450mm
	I.D.	250mm	300mm	350mm	400mm
Lids	Thickness	28mm	28mm	28mm	28mm
	Heating unit (Optional)	JULABO unit	Yes		
Stir	Type of sealling	Double mechanical seal			
	Motor	Overhead stirring motor			
	Speed	20~1800rpm(Other model for optional)			
Frame	Type	SS Frame			
	Liquid receiving tray	Stainless steel			



ReactROL III

Powerful and extensible PLC system

- > The system can provide independent Power to all equipment in the system and has security protection function
- > Integrated Siemens PLC technology, with high quality, stable and reliable.
- > Integrated Auto-Reactor (Industrial) V2.0 software
 - Animated and intuitive main interface, easy operation, real-time monitoring
 - Curve interface (Real-time curve interface, and history curves can be called from database)
 - Programming control interface, save and invoke a set of parameters, Easy to carry out repetitive experiments, parameter optimization experiments and parallel experiments.
 - System Parameter Settings Interface, includes Setting and calibration of system and equipment parameters, Data Corresponding Settings
 - Data recording and storage, Ability to customize fileDescription and data acquisition frequency(.csv format)

Documentation:

- In compliance with FDA and GMP directives
- Operating manual
- P&ID
- Layout drawing
- FAT,SAT,IQ/OQ
- ATEX certification
- CE/GMP certification
- CIP certification

Safety features

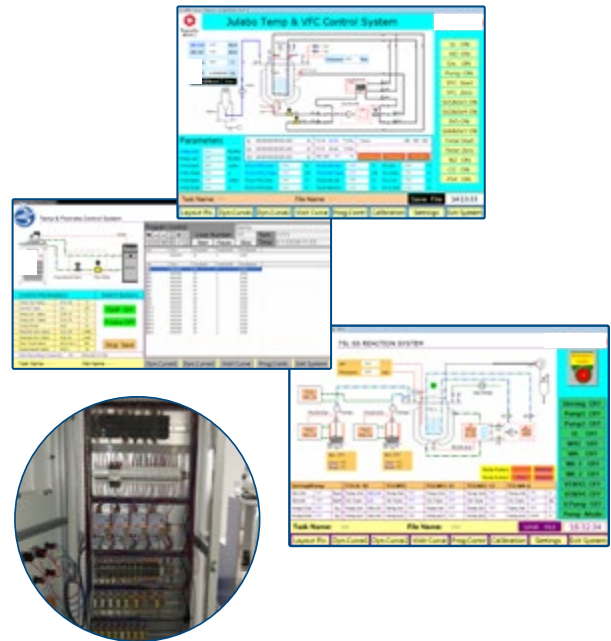
- Rupture disc
- Relief valve
- Safety valve
- Emergency discharge
- Solvent dilution
- ATEX Version

Mode of communication:

- Ethernet interface
- Modbus
- RS-485
- RS-232
- Analog

Instruments and parameters include:

- Temperature of the TCU
- Temperature of the sample in reactor
- Stirring speed
- Vacuum
- Pressure
- pH / DO
- liquid dosing pump
- loading balance
- Turbidity
- Various electronic valves



ATEX Version



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