

Series Number:

# 4520

Type:  
**General Purpose**

Stand:  
**Bench Top**

Mounting Style:  
**Moveable or Fixed Head**

Vessel Sizes, mL:  
**1000-2000**  
**970-1900 HP**

Standard Pressure  
MAWP Rating, psi (bar):  
**1900 (131)**

Standard Maximum  
Operating Temp., °C:  
**225 w/ FKM O-ring**  
**300 w/ FFKM O-ring**  
**350 w/ PTFE Flat Gasket**

High Pressure (HP)  
MAWP Rating, psi (bar):  
**2900 (200)**

Maximum Operating  
Temperature, °C, at  
High Pressure (HP):  
**350 @ 2900 psi**

## Series 4520 Bench Top Reactors, 1 & 2 L

**These are the largest of the Parr Reactors that can be handled on a bench top.**

These reactors are available with an FKM O-ring seal for operating temperatures to 225 °C, and FFKM O-ring for temperatures to 300 °C, or with a flat, PTFE gasket for operating temperatures up to 350 °C maximum.

An optional HP (High Pressure) flat gasket version has been added for maximum allowable working pressure of 2900 psi (200 bar) at 350 °C. Both fixed head and moveable vessel designs are available. An optional pneumatic lift is available for the heavier 2 liter cylinder and heater. It should be noted, however, that the 2 liter, fixed head model is tall and may not be convenient to operate on a standard height bench top. We recommend using a floor stand. (See Series 4530)

With their 4-inch internal diameter, these mid-size reactors have sufficient space for special modifications, such as an internal cooling coil, bottom drain valve (not on 2 liter bench top), ball valve for a solids

charging port, catalyst addition devices, condensers, electrical feed-throughs and more. Details are provided in Chapter 7 of this catalog, starting on [page 115](#).

The standard magnetic stirrer drive on these 4520 Models works well for reaction mixtures

with viscosities up to 25,000 centipoise. For heavier stirring loads, these reactors can be equipped with larger magnetic drives, more powerful motors, and drive trains capable of delivering additional stirring torque.



**Model 4523 Bench Top Reactor, 1000 mL, Fixed Head, open to show Internal Fittings, and a 4848 Controller shown with optional Expansion Modules.**

## 4520

Series 4520 Pressure Reactor System Specifications				
Shaded bar indicates specifications that change within series.				
Model Number	4523	4524	4525	4526
Approximate Volume, mL	1000	2000	1000	2000
Approximate Volume for HP Models, mL	970	1900	970	1900
Maximum Pressure (MAWP)	1900 psi (131 bar)			
HP Maximum Pressure (MAWP)	2900 psi (200 bar)			
<b>Maximum Temperature</b>				
with FKM O-ring	225 °C			
with FFKM O-ring	300 °C			
with PTFE Flat Gasket	350 °C			
<b>Reactor Details</b>				
Mounting Style	Fixed Head		Moveable	
Stand Type	Bench Top			
Closure	Split-Ring (6 Compression Bolts for Flat Gasket, no Compression Bolts for O-ring)			
High Pressure Closure	Split-Ring (12 Compression Bolts for Flat Gasket, no Compression Bolts for O-ring)			
Valve Connections	1/8" Male NPT			
Magnetic Stirrer, Model No.	A1120HC6 General Purpose or A2140HC Footless			
Maximum Torque	16 Inch-Pounds			
Impeller(s), 6 blades	2 (2.28" dia. / HP: 2.00" dia.)			
Stirrer Motor	1/8 hp variable speed			
Pressure Gage, Size	4.5 inches			
Range	0-2000 psi (138 bar) / HP: 0-3000 psi (207 bar)			
Temperature Measurement	Thermowell			
Cooling Coil (optional)	Serpentine			
Bottom Drain Valve (BDV) (optional)				
Standard Pressure (1900 psi)	3/8" NPT	N/A	3/8" NPT	N/A
High Pressure (2900 psi)	1/4" NPT		1/4" NPT	
Lift Mechanism (optional)	Pneumatic		N/A	
<b>Heater Style</b>	Calrod			
Heater Power, Watts	1000 / 1500	1500 / 2000	1000 / 1500	1500 / 2000
<b>Electrical Supply</b>				
Volts, AC	115 / 230			
Maximum Load, amps, 115 / 230	12 / 9			
<b>Cylinder Dimensions</b>				
I.D. x Depth, inches	4.0 x 5.4	4.0 x 10.5	4.0 x 5.4	4.0 x 10.5
I.D. x Depth, inches for HP	3.75 x 5.4	3.75 x 10.5	3.75 x 5.4	3.75 x 10.5
Vessel Assembly Weight, pounds	33	38	30	36
Vessel Assembly Weight for HP, pounds	36	44	35	43
Cylinder Weight, pounds	8.9	13.7	8.9	13.7
Cylinder Weight for HP, pounds	11.3	18.4	11.3	18.4
<b>Reactor Dimensions</b>				
Width x Depth w/o Controller, inches	17 x 24			
Height, inches	38 (48 with BDV)	48	38 (48 with BDV)	48
Weight, pounds	105	120	100	115
<b>Spare Parts Kit</b>	4529M			
Other options available. See Ordering Guide, visit <a href="http://www.parrinst.com">www.parrinst.com</a> , or call for more information. Weights and dimensions are estimated from the base model. Final weights and dimensions will vary based on options selected.				

Series Number:

# 4520

## Series 4520 Bench Top Reactors, 1 & 2 L

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Model 4523 Bench Top Reactor,  
1000 mL, Fixed Head



Model 4526 Bench Top Reactor, 2000 mL, Moveable Head, and a 4848 Controller shown with optional Expansion Modules.

# Series 4520 Ordering Guide

The Order No. for the Base System is: **452\_\_-T-SS-M-115-VS.12-2000-4848**

A composite identification number to be used when ordering a 4520 Series Reactor can be developed by combining individual symbols from the separate sections below. For more information on how to use this ordering guide, [please see page 27](#).

A Base Model		
Model No.	Size	Vessel Style
4523	1000 mL	Fixed
4524	2000 mL	Fixed
4525	1000 mL	Moveable
4526	2000 mL	Moveable

High Pressure sizes are 970 mL & 1900 mL

B High Pressure Option	
-No Symbol	Standard Configuration (1900 psi / 131 bar)
-HP	2900 psi (200 bar)

C Gasket / Maximum Temperature	
-OV	FKM O-ring, 225 °C
-OK	FFKM O-ring, 300 °C
-T	PTFE Flat Gasket, 350 °C

D Vessel Material of Construction	
-SS	T316 Stainless Steel
-M0	Alloy 400
-IN	Alloy 600
-HB	Alloy B-2 / B-3
-HC	Alloy C-276
-CS	Alloy 20
-Ti2	Titanium Grade 2
-Ti4	Titanium Grade 4
-ZR702	Zirconium Grade 702
-ZR705	Zirconium Grade 705

See [page 10](#) or [24](#) for complete list of available alloys.

E Magnetic Stirrer Drive	
-M	General Purpose, 16 in-lb
-HD	Heavy Duty, 60 in-lb
-FMD1	Footless, General Purpose, 16 in-lb
-FMD2	Footless, Heavy Duty, 60 in-lb

F Mag. Drive Material of Construction	
-MOC Symbol	Indicate Material of Construction

G Electrical Supply	
-115	115 VAC
-230	230 VAC

H Motor Option	
-VS .12	Variable Speed, 1/8 hp
-VS .25	Variable Speed, 1/4 hp
-VS .50*	Variable Speed, 1/2 hp (230V only)
-XP .25	Explosion Proof, Variable Speed, 1/4 hp
-XP .50*	Explosion Proof, Variable Speed, 1/2 hp (230V only)
-AM .25	Air Motor, 1/4 hp
-AM .50	Air Motor, 1/2 hp

\* For use with Heavy Duty Magnetic Stirrer

I Pressure Gage	
-3000	3000 psi / 207 bar
-2000	2000 psi / 138 bar
-1000	1000 psi / 69 bar
-600	600 psi / 40 bar
-200	200 psi / 14 bar
-100	100 psi / 7 bar

J Internal Cooling Coil	
-SC	Serpentine Coil

K Bottom Drain Valve	
-BDV	Bottom Drain Valve, 3/8" NPT for standard systems, 1/4" NPT for HP systems (4523 & 4525 only)

L Controller	
-4848 (included in base system)	PID Control, Ramp & Soak Programming, Motor Speed Control, and Data logging with Software. (RS-485 to USB cable not included) For use with up to three additional display modules.
-4848B	Same as above but for use with up to six additional display modules.
-A2110E	Motor Controller
-4871	Process Controller (for enhanced control options)

See [Chapter 6](#) for a complete list of controllers and options.

M 4848 Controller Options	
-TDM	Tachometer Display Module
-MCM	Motor Control Module w/Tachometer
-PDM	Pressure Display Module
-HTM	High Temperature Cut Off Module
-ETLM	External Temperature Limit Module
-MTM	Motor Torque Module ( <i>must be installed with the MCM</i> )
-SVM	Solenoid Valve Module (for cooling control)
-A1925E4	RS-485 to USB Cable for 4848 Controller (required for data logging)
-A1925E6	RS-485 to USB Converter, isolated, 30-ft
-A2208E	RS-485 Daisy Chain for Multiple Controllers (Must be used with 1925E6)
-A3504HC	SpecView Software Package for 4838/4848 Controller

N Custom Options (List All Desired)	
-AS	Anchor Stirrer
-PS	Paddle Stirrer
-SA	Spiral Stirrer
-GE	Gas Entrainment Stirrer
-BF	Removable Baffle Set
-SB	Static Catalyst Basket
-DB	Dynamic Catalyst Basket
-CAD	Internal Catalyst Addition Device
-XCAD	External Catalyst Addition Device
-SCP	Solids Charging Port (Ball Valve)
-RC	Reflux Condenser
-RTC	Reflux/Take-Off Condenser
-WJ	Welded Jacket
-ABH	Aluminum Block Heater with Cooling Channels
-PL	Pneumatic Lift

See [Chapter 7](#) for a complete list of optional accessories.

O Certifications	
-ASME	ASME Documentation
-CE	CE Documentation
-P	Parr Certification

P Spare Parts Kit	
-4529M	Spare Parts Kit for 4520 Series

Please note that all options and combinations are not compatible with all models.