

Series Number:

# 5500

Type:  
**High Pressure, Compact**

Stand:  
**Bench Top**

Mounting Style:  
**Moveable**

Vessel Sizes, mL:  
**25-600**

Standard Pressure  
MAWP, psi (bar):  
**3000 (207)**

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

## Series 5500 HP Compact Reactors, 25-600 mL

### Familiar Parr Designs

All of the safety, convenience and reliability features which have been the hallmark of Parr pressure reaction equipment for more than 50 years have been incorporated into a new line of high pressure, compact laboratory reactors.

**The Series 5500 Compact Reactors** are based upon our popular micro and mini, Series 4590 & 4560 Reactors. There are several differences between these new reactors and their original counterparts. Primarily, these are:

- A smaller, more compact magnetic drive is installed.
- A smaller, more compact variable speed stirrer motor.
- The larger support stand, overarm and motor have been eliminated.
- An Aluminum Block Heater also serves as the support stand.

As a result of these changes, we are able to offer these reactors to users who do not require the wide variety of options and expandability provided by our Series 4560 and 4590 Reactors at a significantly lower cost. These designs will be welcomed by not only scientists with limited space or budgets, but also by those building multiple reactor installations for combinatorial chemistry or high throughput investigations.

**The reaction vessels used in these reactors** are identical to the ones furnished in the Series 4590 Micro and Series 4560 Mini Reactors and use the popular Parr split ring closure. These vessels are rated for a maximum working pressure of 3000 psi. The maximum operating temperature is dependent upon the seal selected, PTFE gasket for up to 350 °C; with FKM O-ring to 225 °C or FFKM O-ring to 300 °C.

The 25, 50, and 100 mL reactors are equipped with gas inlet and outlet valve, a liquid sampling valve, pressure gage, safety rupture disc, and internal thermocouple in addition to the internal stirrer. The 300, 450, and 600 mL reactors provide an optional internal cooling loop in addition to these fittings. In addition to the standard Type 316 Stainless Steel, the vessels for these reactors can also be constructed from any of the standard Parr materials of construction.

These vessels are designed, built and can be certified to the ASME Pressure Vessel Code, European Community

P.E.D. and other appropriate local codes. Electrical safety is certified by CSA and the EC-CE mark.

### New Magnetic Drive

To take advantage of the new technology available in magnets today, Parr has designed a new compact, magnetically-coupled stirrer drive especially for these smaller vessels. Tests show that this new drive is sufficient to stir reaction mixtures with viscosities up to 10,000 centipoise in a 600 mL reaction vessel.

### Variable Speed Motor

A 1/17 hp variable speed motor provides stirring speeds adjustable from 0 to 1700 rpm. An optional tachometer pickup provides a signal to the optional tachometer display module which can be installed in the 4848 Controller.

### New Heater / Reactor Support

A new heater that also serves as the vessel support has been designed for these reactors. This is an aluminum block style heater for excellent thermal uniformity. The cartridge heaters used in this heating block are easily replaced if required. A stainless steel heat shield is provided around the heating block. This style of heater/reactor support provides a very small footprint, ideal for limited bench space.

### Model 4848 Temperature Controller

The Series 4848 Controller used with the standard Parr line of medium and high pressure reactors is also furnished for use with these reactors. The 4848 offers the user options for redundant temperature sensor and alarm, digital



Parr Series 5500 HPCL Reactor and a 4848 Reactor Controller shown with optional Expansion Modules.

## 5500

Series 5500 Pressure Reactor System Specifications								
Shaded bar indicates specifications that change within series.								
Model Number	5511	5512	5513	5521	5522	5523	5524	5525
Sizes, mL	25	50	100	300	450	600	160	100
Maximum Pressure	3000 psi (207 bar, 200 bar for CE orders)							
Maximum Temperature								
with FKM O-ring	225 °C							
with FFKM O-ring	300 °C							
with PTFE Flat Gasket	350 °C							
Reactor Details								
Mounting Style	Moveable							
Stand Type	Compact Bench Top							
Closure	Split-Ring (6 Compression Bolts for Flat Gasket, No Compression Bolts for O-ring)							
Valve Connections	1/8" Male NPT							
Maximum Torque	2.5 Inch-Pounds (0.28 Nm)							
Impeller(s), 4-blade	1 (0.81" dia.)			1 (0.81" dia.)		2 (1.38" dia.)		1 (0.81" dia.)
Stirrer Motor, Variable Speed	1/17 hp							
Pressure Gage, Size	3.5 inches							
Range	0-3000 psi (207 bar)							
Temperature Measurement	Fixed Thermocouple							
Cooling Coil	Coldfinger (optional)		Standard Single Loop			Spiral (optional)		
Bottom Drain Valve	N/A							
Heater Style	Aluminum Block (External Cooling optional)							
Heater Power, Watts	700		1000	700		1000		700
Electrical Supply								
Volts, AC	115 / 230							
Maximum Load, amps, 115 / 230	8 / 4		10 / 5	8 / 4		10 / 5		8 / 4
Cylinder Dimensions								
I.D. x Depth, inches	1.0 x 2.0	1.3 x 2.25	1.3 x 4.5	2.5 x 4.0	2.5 x 6.0	2.5 x 8.0	2.5 x 2.0	2.0 x 2.0
Vessel Assembly Weight, pounds	17	17	18	17	18	20	16	16
Cylinder Weight, pounds	3.5	3.1	4.2	3.7	4.9	6.2	2.4	3.3
Reactor/Stand Dimensions								
Width x Depth w/o Controller, inches	8.3 x 9.5							
Height, inches	23	23	25	23	25	27	23	23
Weight, pounds	25	25	25	26	28	30	25	25
Spare Parts Kit	5509M							
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.								

pressure readout, stirring speed display or control, motor load, and bi-directional digital communication (RS-485).

### Alternate Controllers Available

A single 4871 Process Controller can control up to eight high pressure, compact laboratory reactors.

### Options

As shown in the ordering guide, a variety of options are available for these Series 5500 Reactors. In addition to the

options described here, there are a number of additional accessories such as glass or PTFE liners, special stirrers, gages, gas and liquid feed systems, custom valves, etc., as described in the Options Section of the Ordering Guide.

The Series 5500 Reactors have been designed and packaged to provide the basic functions of a small laboratory reactor and not all of the options available for the more versatile Series 4560 and 4590 Reactors can be incorporated into these units.

# Series 5500 Ordering Guide

The Order No. for the Base System is: **55\_\_\_-T-SS-115-VS-M-3000-4848**

A composite identification number to be used when ordering a 5500 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.

<b>A Base Model</b>		
Model No.	Size	Cylinder, I.D.
5511	25 mL	1.0-inch
5512	50 mL	1.3-inch
5513	100 mL	1.3-inch
5521	300 mL	2.5-inch
5522	450 mL	2.5-inch
5523	600 mL	2.5-inch
5524	160 mL	2.5-inch
5525	100 mL	2.0-inch

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

<b>C Materials of Construction (MOC)</b>	
-SS	T316 Stainless Steel
-MO	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.

<b>D Electrical Supply</b>	
-115	115 VAC
-230	230 VAC

<b>E Motor</b>	
-VS	1/17 HP Variable Speed

<b>F Magnetic Stirrer Drive</b>	
-M	General Purpose Magnetic

<b>G Mag. Drive Materials of Construction</b>	
-MOC Symbol	Indicate Material of Construction

<b>H Pressure Gage</b>	
-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

<b>I Controller</b>	
-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.

<b>J 4848 Controller Options</b>	
-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
-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 Controller (must be used with A1925E6)
-A3504HC	SpecView Software Package for 4838/4848

\* The MTM must be installed in conjunction with the MCM.

<b>K Custom Options (List All Desired)</b>	
-GE	Gas Entrainment Stirrer
-BF	Removeable Baffle Set
-CAD	Internal Catalyst Addition Device
-XCAD	External Catalyst Addition Device
-SCP	Solids Charging Port (Ball Valve)
-RC	Reflux Condenser
-RTC	Reflux/Take-Off Condenser

See Chapter 7 for a complete list of optional accessories.

<b>L Certifications</b>	
-ASME	ASME Documentation
-CE	CE Documentation
-P	Parr Certification

<b>M Spare Parts Kit</b>	
-5509M	Spare Parts Kit for 5500 Series

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