

Series 4590 Micro Reactor Systems

Series Number:

4590

Type:

Micro

Stand:

Bench Top

Vessel Mounting:

**Moveable or
Fixed Head**

Sizes, mL:

25, 50, 100

Standard Pressure

MAWP Rating, psi (bar):
3000 (200)

High Pressure (HP)

MAWP Rating, psi (bar):
5000 (345)

Standard Maximum
Operating Temp., °C:

225 w/ FKM O-ring

275 w/ FFKM O-ring

350 w/ PTFE Flat Gasket

High Temperature (HT) /
High Pressure (HP)
Maximum Operating
Temperature, °C:

**500 w/ FG Flat Gasket
(Fixed Head Only)**



4597 Micro Reactor, Fixed Head, 50 mL, and a 4848 Reactor Controller with optional Expansion Modules.

These are the smallest of all Parr Stirred Reactors. They will be a good choice for chemists working with very expensive materials or materials only available in small amounts. They will also appeal to users who wish to minimize the risks associated with hazardous materials or reactions by restricting the reactants or products to a minimum. Use of the Series 4590 Reactors also helps minimize the quantities of waste products which may require special disposal procedures. The 4590 systems are now available in high pressure (5000 psi) or high pressure/high temperature (500 °C) versions.

These micro reactors have been designed to provide as many of the features of the larger vessels as possible in the limited space available. All of the standard head fittings are provided, with optional cooling now available with aluminum block heaters with cooling capability, welded jackets or Cold Fingers.

These systems are offered in both fixed head and moveable head vessel styles with choices of a self sealing O-ring for temperatures up to 225 °C or with FFKM O-ring for temperatures to 275 °C or with a flat PTFE gasket for temperatures to 350 °C, or with a Flexible Graphite gasket for temperatures to 500 °C with the HP/HT option (for fixed head versions only). A split ring closure is standard.

All three volumes use the same ceramic fiber heater.

These micro reactors can be easily converted from one size to another by simply substituting a larger or smaller cylinder and the corresponding internal fittings. The support system can also be readily adapted to accept any of the vessels from the 4560 Mini Reactor Series. The opportunity to modify these small reactors is restricted because of the limited head space available.



Series 4590 Pressure Reactor System Specifications						
Shaded bar indicates specifications that change within series.						
Model Number	4591	4592	4593	4596	4597	4598
Sizes, mL	25	50	100	25	50	100
Maximum Pressure (MAWP)	3000 psi (200 bar)					
HP Maximum Pressure (MAWP)	5000 psi (345 bar)					
Maximum Temperature						
with FKM O-ring	225 °C Split Rings with Latches					
with FFKM O-ring	275 °C Split Rings with Latches					
with PTFE Compression Gasket	350 °C Split Rings (6 Cap Screws)					
with FG Flexible Graphite	NA			500 °C Split Rings		
Vessel Style	Moveable			Fixed Head		
Reactor Mounting	Bench Top					
Closure	Split-Ring (6 Cap Screws)					
Valve Connections	1/8" NPT Male (1/4" NPT Male required for HP/HT)					
Magnetic Stirrer, Model No.	A1120HC6					
Maximum Torque	16 Inch-Pounds					
Impeller, 4-Blade	1 (.81" dia.)					
Pressure Gage, Size	3.5 inches					
Range	0-3000 psi (200 bar)					
Range w/ HP/HT Option	N/A			0-5000 psi (345 bar)		
Temperature Measurement	Fixed Thermocouple (Thermowell for special alloys)					
Cooling Coil	Optional					
Bottom Drain Valve (Optional)	1/4" NPT (Not Available on HP/HT)					
Heater Style	Ceramic Fiber Heater					
Heater Power, Watts	700					
Stirrer Motor	1/8 hp Variable Speed					
Electrical Supply						
Volts, AC	115 or 230					
Maximum Load, amps, 115 / 230	6 / 3		5 / 2	6 / 3		5 / 2
Maximum Load, amps, HP/HT, 115 / 230	NA			8 / 5		
Vessel Dimensions						
Inside Diameter, inches	1.0	1.3	1.3	1.0	1.3	1.3
Inside Depth, inches	2.0	2.3	4.6	2.0	2.3	4.6
Weight of Vessel, pounds	7	7	8	7	7	8
Reactor Dimensions						
Width, inches w/o Controller	12					
Depth, inches	18					
Height, inches*	28		36	28		36
Weight, pounds	55	55	56	56	56	57
Spare Parts Kit	4599M					
* Add 4" to height with Bottom Drain Valve option.						
Other options available. See Ordering Guide, visit www.parrinst.com , or call for more information.						

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Model 4593 Reactor, 100 mL Moveable Vessel, with PTFE Compression Gasket, and Split Ring Closure, Mantle Heater, shown with a 4848 Reactor Controller with optional Expansion Modules.



Model 4593 100 ml stirred vessel.



Series 4590 Ordering Guide

The Order No. for the Base System is: **459__-T-SS-M-115-VS.12-3000-4848**

A composite identification number to be used when ordering a 4590 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	Size	Vessel Style
4591	25 mL	Moveable
4592	50 mL	Moveable
4593	100 mL	Moveable
4596	25 mL	Fixed Head
4597	50 mL	Fixed Head
4598	100 mL	Fixed Head

B Moveable Head Options	
-No Symbol	Standard Configuration
-HP	5,000 psi (345 bar) @ 350 °C

Fixed Head Options	
-No Symbol	Standard Configuration
-HP	5,000 psi (345 bar) @ 350 °C
-HP/HT	5,000 psi (345 bar) @ 500 °C

C Gasket / Maximum Temperature	
-OV	FKM O-ring / 225 °C
-OK	FFKM O-ring / 275 °C
-T	PTFE Compression Gasket / 350 °C
-FG	Flexible Graphite / 500 °C (HP/HT option only)

D Material of Construction	
-SS	T316 Stainless Steel
-M0	Alloy 400*
-IN	Alloy 600
-HB	Alloy B-2*
-HC	Alloy C-276
-CS	Alloy 20*
-TI2	Titanium Grade 2*
-TI4	Titanium Grade 4*
-NI	Nickel 200
-ZR	Zirconium Grade 702* or 705*

* Maximum temperature limited.

E Stirrer Drive	
-M	General Purpose Magnetic

F Mag. Drive Material of Construction	
-No Symbol	Same Material As Vessel
-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
-XP .25	Explosion Proof Variable Speed, 1/4 hp
-AM .25	Air Motor, 1/4 hp

I Pressure Gage	
-5000	5000 psi / 345 bar
-3000	3000 psi / 200 bar
-2000	2000 psi / 137 bar
-1000	1000 psi / 70 bar
-600	600 psi / 40 bar
-200	200 psi / 14 bar
-100	100 psi / 7 bar

J Controller	
-4848	PID Control, Ramp & Soak Programming, Motor Speed Control, and Data logging with Software
-A1925E4	Optional RS485 to USB Cable for 4848 Controller
-4871	Process Controller

K 4848 Expansion Modules	
-TDM	Tachometer Display Module
-MCM	Tachometer w/Motor Control Module
-PDM	Pressure Display Module
-HTM	High Temperature Cut Off Module
-ETLM	External Temperature Limit Module
-MTM	Motor Torque Module

L 4848 Cooling Control: Solenoid Valve Module	
-SVM1	115 VAC
-SVM2	230 VAC

M Custom Options (List All Desired)	
-RC	Reflux Condenser
-RTC	Reflux Take-off Condenser
-GE	Gas Entrainment Stirrer
-ABH	Aluminum Block Heater
-WJ	Welded Jacket

N Certifications	
-No Symbol	No Certification
-ASME	ASME Certification
-CE/PED	European Community Certification/Pressure
-CH	China Certification
-P	Parr Certification

O Spare Parts Kit	
-4599	Spare Parts Kit for 4590 Series
-4599HT	Spare Parts Kit for 4590HT Series