

# ZipperClave®

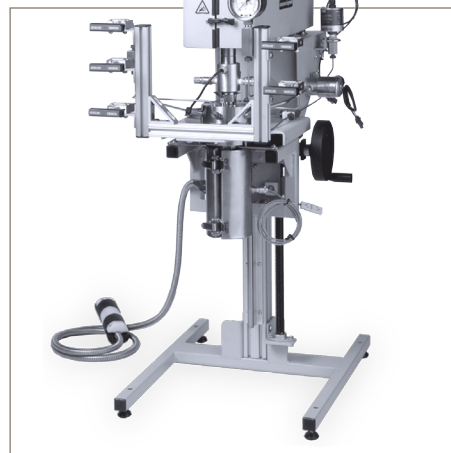
## Stirred Reactors: 500 and 1,000 ml

**Volume:** 500 and 1,000 ml

**Vessel MAWP\*:** 2,200 psi @ 450°F (151 bar @ 232°C)

**Material of Construction:** 316 Stainless Steel, Hastelloy C276

\* Maximum Allowable Working Pressure



### Principle of Operation:

The Parker Autoclave Engineers' ZipperClave® Reactor has been designed to provide the researcher with a reliable quick-opening closure. The main seal of the reactor is an O-ring available in many different materials. The 500 ml and 1,000 ml units are identical in design except for the depth of the reactor. Conversion kits are available between the two sizes. Many combinations of standard components are available. The cover of the unit remains fixed in the stand to permit opening of the vessel without disassembling any process connections. The body is easily removed and drops away from the cover.

### General Specifications:

#### Maximum Allowable Working Pressure (MAWP) - Design Pressure

2,200 psi @ 450°F (151 Bar @ 232°C) [See Note](#)

#### Minimum Design Metal Temperature (MDMT)

40°F @ 2,200 psi (4°C @ 151 Bar)

#### Maximum Recommended Operating Pressure (MROP)

Varies based on gauge, transducer, and rupture disk selection.  
Refer to Ordering Guide for Details.

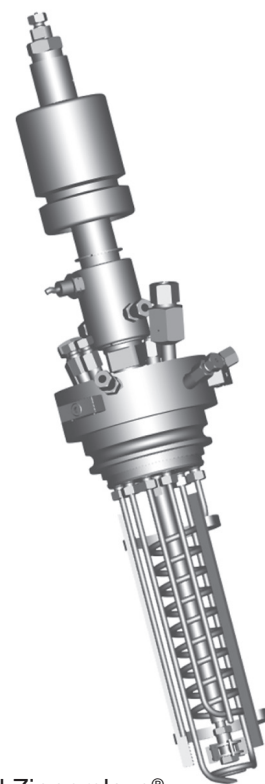
Critical Dimensions	500 ml	1000 ml
Inside Diameter	3.0" (76 mm)	3.0" (76 mm)
Straight Wall	4.59" (117 mm)	8.71" (221 mm)

Approximate Dimensions	Tall Bench Top	Floor Stand
Overall Height **	37.9" (963 mm)	60.2" (1529 mm)
Width	20.54" (522 mm)	25.0" (635 mm)
Depth	26.4" (670 mm)	26.5" (673 mm)

**Note** The user should be aware that the 450°F (232°C) vessel temperature rating is the maximum mean wall temperature of the vessel, as defined by the ASME B&PV Code. Many variables can affect the thermal capabilities of the vessel. These factors can include, but are not limited to, the use of insulation, whether the process is batch or continuous flow, or even a chemical process itself. These factors may have bearing on heat up rate, maximum process temperature, and the cool down rate of the reactor. These factors should be considered by the user when purchasing a system in order to verify that the equipment will reach desired operating temperature in a reasonable time period. Please consult Parker Autoclave Engineers if assistance is required.

\*\* Overall height based on belt driven units. Consult factory for overall height of other configurations.



1,000 ml ZipperClave®  
Reactor Internals



ENGINEERING YOUR SUCCESS.

## Features:

- Versatile product configuration
- Operating pressures as high as 1,880 psi @ 450°F (130 bar @ 232°C)
- Open vessel and remove body without disassembling pressure connections
- Available worldwide to meet codes such as CE and CRN

## Connection Schedule:

All of the connections shown will be provided. For any accessories not ordered, the corresponding connection will be plugged. All connections at cover are AE high temperature F437 Flat Bottom adapted to the “External” connection listed below.

Opening	Purpose	Internal	External	Location	Smallest Diameter Orifice (nominal) in flow path
<b>A</b>	Charging Port	0.38" Port	3/8" O.D. Tube	Cover Top	0.25"
<b>B</b>	Gas Inlet	SW187 (3/16" ) Connection	1/8" O.D. Tube	Cover Top	0.062"
<b>C</b>	Sparge Tube †	3/16" O.D. Tube	1/8" O.D. Tube	Cover Top	0.031" †
<b>D &amp; H</b>	Cooling Coil	3/16" O.D. Tube	1/4" O.D. Tube	Cover Side	0.125"
<b>E</b>	Vent & Pressure Indication	0.19" Port	1/8" O.D. Tube	Cover Side	0.062"
<b>F</b>	Safety Head	0.19" Port	3/8" FNPT	Cover Top	0.19"
<b>G</b>	Thermowell * ††	3/16" O.D. Tube	0.129" Port	Cover Top	NA
<b>J</b>	Blow Pipe	3/16" O.D. Tube	1/8" O.D. Tube	Cover Top	0.062"
<b>K</b>	Liquid Sample	3/16" O.D. Tube	1/8" O.D. Tube	Cover Top	0.062"
<b>L</b>	MagneDrive® Agitator	1/2" O.D. Mixing Shaft	AE Special	Cover Top	NA

\* Thermowell only provided if heating/cooling option is selected

† The tube that forms the sparge tube is 3/16" O.D. and 1/8" I.D. with a plug in the end. Nine .031" diameter holes are drilled in the sparge ring to bubble gas into the reactor.

†† The tube that forms the thermowell is 3/16" O.D. and 1/8" I.D. with a plug in the end. A 0.129" port is drilled in the cover to guide the thermocouple to the opening in the thermowell.

## Technical Specifications:

Parker Autoclave Engineers provides a variety of optional accessories to custom configure your reactor. See the **Ordering Guide** on the back cover to configure a reactor for your specific application.

- Seal Materials:** Nitrile, EPR, PTFE Encapsulated FKM, FKM, Silicone or FFKM o-rings
- Approvals:** Optional CE Mark or Canadian Registration (CRN)
- Stand:** Tall Bench Top or Floor Stand
- Body Lift:** None or Manual Jack
- Agitator:** MagneDrive® MAG075-01 Series with 7 in-lb (0.79 N-m) static torque, Purebon®<sup>6</sup> (carbon graphite) or FPGF bearings  
MagneDrive® MAG075-02 Series with 16 in-lb (1.8 N-m) static torque, Purebon®<sup>6</sup> (carbon graphite) or FPGF bearings  
iMag075® Series with 7 in-lb (0.79 N-m) static torque, Purebon®<sup>6</sup> (carbon graphite) or FPGF bearings
- Motors:** 1/2 HP (0.37 KW) General Purpose DC with either: 90 V Armature (120 V unit), or 180 V Armature (240 V unit).  
1/2 HP (0.37 KW) Explosion-Proof DC with either: 90 V Armature (120 V unit), or 180 V Armature (240 V unit).  
Air Motor with manual or electronic speed adjustment.  
1/8 HP (0.09 KW) or 1/3 HP (0.25 KW) General Purpose DC with 130 V Armature
- Impeller Styles:** AE Dispersimax®, Straight Turbine, Axial Flow-Up, or Axial Flow-Down; All 1.25 inch (31.8 mm) diameter.
- Baffle:** Two (2) blade spring loaded baffle bar (removable)
- Speed Sensor:** Magnetic Sensor General Purpose
- Heating Furnaces:** 120 VAC or 240 VAC, Single Phase: **500 ml** (120V-550 watt, 240V-600 watt), **1000 ml** (120V-1100 watt, 240V-1200 watt)
- Jacket:** Removable, spiral baffled with O-ring seals.

Internal Accessories Available	External Accessories Available
<ul style="list-style-type: none"> <li>• Liquid Sample Tube with Filter: optional 1/8" Valve</li> <li>• Blow Pipe, optional 1/8" Valve</li> <li>• Sparge Tube, optional 1/8" Valve</li> <li>• Cooling Coil, optional Manual or Solenoid 1/4" Valve</li> <li>• Process Thermocouple Type K</li> </ul>	<ul style="list-style-type: none"> <li>• Vent Valve, 1/8" Valve</li> <li>• 2.5" (63.5 mm) Dial Pressure Gauge - multiple ranges available</li> <li>• Pressure Transducer - Range dependent on gauge</li> <li>• One or two gas Inlet, 1/8" Valves, Shared Connection</li> <li>• Catalyst Charging Valve, 3/8" O.D. Tube with 3/8" Port</li> <li>• External Thermocouple Type K</li> <li>• 1/2" Port Manual Flush valve (Requires Floor Stand)</li> <li>• Forward Pressure Regulation (FPR), or Back Pressure Regulation (BPR)</li> </ul>

## Supporting Information:

Engineering drawings are available upon request from Parker Autoclave Engineers for more detailed technical information. Reference our catalog for additional literature on ZipperClave Ordering Guide, Instrumentation, Agitation, Pressure Vessels, and Stirred Reactors.

Drawings				Drawing Title
316 Stainless Steel		Hastelloy® C-276		
500 ml	1000 ml	500 ml	1000 ml	
40A-8546		40A-8687		Bench Top ZipperClave® General Arrangement
40A-8322		40A-8688		Light Duty Floor Stand ZipperClave® General Arrangement
40A-8547	40A-8548	40A-8662	40A-8663	ZipperClave® Reactor
30A-9605		30B-0382		MAG 075 MagneDrive® Assembly
40C-0513		40C-0998		iMAG 075 MagneDrive® Inline Drive
30A-9640		30B-0479		1/8" Valve Rack

## Ordering Guide:

Model Code	Pressure Vessel						MagneDrive® Agitator					Internal Accessories				External Accessories					
<b>Z 0 5 0</b>	<b>S</b>	<b>S</b>	<b>B</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>A</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>A</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>D</b>	<b>1</b>	<b>1</b>	<b>0</b>
Volume	<b>A</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>J</b>	<b>K</b>	<b>L</b>	<b>M</b>	<b>N</b>	<b>O</b>	<b>P</b>	<b>R</b>	<b>S</b>	<b>T</b>	<b>U</b>	<b>V</b>

Part Number Example: **Z050SSB1231A111A11011D110** (example selections indicated in yellow below)

### Model Code

Volume	
<b>050</b>	500 ml ZipperClave Reactor
<b>100</b>	1,000 ml ZipperClave Reactor

### Pressure Vessel

AA - Vessel Material	
<b>SS</b>	316 Stainless Steel
<b>HC</b>	Hastelloy® C-276 <sup>1</sup>

B - O-ring Seal Material	
<b>B</b>	Nitrile (Max. Temp. 250°F/121°C) <sup>2</sup>
<b>C</b>	Ethylene-Propylene (Max. Temp. 300°F/149°C) <sup>2</sup>
<b>D</b>	PTFE (PTFE Encapsulated FKM) (Max. Temp. 400°F / 204°C) <sup>2</sup>
<b>E</b>	FKM (Max. Temp. 450°F /232°C) <sup>2</sup>
<b>F</b>	Silicone (Max. Temp. 400°F /204°C) <sup>2</sup>
<b>G</b>	FFKM (Kalrez®) <sup>3</sup> (Max. Temp. 500°F /260°C) <sup>2</sup>

C - Body Bottom Connection	
<b>0</b>	None (No Connection)
<b>1</b>	1/2" Port Manual valve (requires Floor Stand) <sup>4</sup>
<b>2</b>	AE "Flat Bottom" Connection

D - Approvals Available <sup>10</sup>	
<b>0</b>	None Required
<b>2</b>	CE Mark and PED
<b>3</b>	Canadian Registration (Consult Factory)

E - Stand	
<b>0</b>	None
<b>2</b>	Tall Bench Top
<b>3</b>	Floor

F - Body Lift Mechanism	
<b>0</b>	None
<b>1</b>	Manual Jack
<b>2</b>	Manual Jack (CE)

### MagneDrive® Agitator

G - MagneDrive® Agitator	
<b>A</b>	MAG075-01 Belt Driven
<b>B</b>	iMAG075 Inline
<b>C</b>	MAG075-02 Belt Driven
<b>X</b>	No MagneDrive® with opening plugged

H - Bearings	
<b>0</b>	None <sup>5</sup>
<b>1</b>	Purebon® <sup>6</sup> (Carbon Graphite)
<b>2</b>	Fluoropolymer with graphite fiber <sup>7</sup>
<b>3</b>	Purebon® <sup>6</sup> 3310

J - Speed Sensors	
<b>0</b>	None
<b>1</b>	General Purpose Hall Effect

K - Motors	
<b>0</b>	None
<b>1</b>	DC Variable Speed, 90 VDC, General Purpose
<b>2</b>	DC Variable Speed, 180 VDC, General Purpose
<b>3</b>	DC Variable Speed, 90 VDC, XP (Non-CE Mark)
<b>4</b>	DC Variable Speed, 180 VDC, XP (Non-CE Mark)
<b>5</b>	Air with Manual Speed Adjust
<b>6</b>	Air with Electronic Speed Adjust
<b>7</b>	AC Motor, XP CE Mark
<b>C</b>	Belt & Guard WITHOUT MOTOR
<b>D</b>	1/8 HP 0-130 VDC Variable Speed GP Inline
<b>E</b>	1/3 HP 0-130 VDC Variable Speed GP Inline
<b>F</b>	Air Motor - Manual Speed Adjust Inline
<b>G</b>	Air Motor - Electronic Speed Adjust Inline

L - Impellers / Shaft / Baffles	
<b>A</b>	AE Dispersimax™ (6 blades) with Baffle Bar
<b>B</b>	Turbine (6 blades) with Baffle Bar
<b>C</b>	Axial-Up (4 blades) with Baffle Bar
<b>D</b>	Axial-Down (4 blades) with Baffle Bar
<b>X</b>	None <sup>5</sup>

## Internal Accessories

M - Liquid Sample	
0	None, Plugged Connection
1	Sample Tube Only
2	Sample Tube with Manual Valve
5	Sample Tube with Manual Valve & Filter

N - Blow Pipe	
0	None, Plugged Connection
1	Blow Pipe Only
2	Blow Pipe with Manual Valve

O - Sparge Tube	
0	None, Plugged Connection
1	Sparge Tube Only
2	Sparge Tube with Manual Valve

P - Cooling Coil	
0	None, Plugged Connection
1	Cooling Coil Only
2	Cooling Coil with Manual Valve
3	Cooling Coil with Solenoid Valve (120 Volt)
4	Cooling Coil with Solenoid Valve (240 Volt)

### NOTES:

- HASTELLOY® is a registered trademark of Haynes International Inc.
- Temperature limits are suggested. Actual performance will vary with chemical compatibility.
- Kalrez® is a registered trademark of DuPont.
- The drain valve is a "Flush" design (no dead volume) that extends approximately 8.25" (210 mm) below the vessel.
- Use this option only if X (No MagneDrive®) is selected as the model of MagneDrive® agitator
- Purebon® is a registered trademark of Morgan AM&T.
- Fluoropolymer bearings have a maximum recommended service temperature of 500°F (260°C).
- MROP may be further reduced by temperature and number of cycles.
- When heating/cooling is selected, the reactor is supplied with a process Type K Thermocouple and Thermowell, and an external Type K Thermocouple. When no heating/cooling is selected, the reactor will be supplied with a plugged connection for the process thermocouple.
- Consult factory for pricing and rating of code vessels.

## External Accessories

R - Vent Valve	
0	None, Plugged Connection
1	Vent with Manual Valve
2	High Volume Vent with Solenoid Valve (120 Volt)
3	High Volume Vent with Solenoid Valve (240 Volt)
4	BPR Digital (120 Volt)
5	BPR Digital (240 Volt)
7	BPR Digital with High Volume Vent 120 VAC Solenoid
8	BPR Digital with High Volume Vent 240 VAC Solenoid

S - Pressure Gauge/Transducer (MROP = Max. Recommended Operating Pressure)	
A	600 psi Gauge Only (450 psi MROP) <sup>8</sup>
B	1,000 psi Gauge Only (750 psi MROP) <sup>8</sup>
C	2,000 psi Gauge Only (1,500 psi MROP) <sup>8</sup>
D	3,000 psi Gauge Only (1,880 psi MROP) <sup>8</sup>
G	600 psi Gauge/1 ksi Transducer (450 psi MROP) <sup>8</sup>
H	1,000 psi Gauge/1 ksi Transducer (750 psi MROP) <sup>8</sup>
J	2,000 psi Gauge/3 ksi Transducer (1,500 psi MROP) <sup>8</sup>
K	3,000 psi Gauge/3 ksi Transducer (1,880 psi MROP) <sup>8</sup>
N	600 psi Gauge/1 ksi IS Transducer (450 psi MROP) <sup>8</sup>
P	1,000 psi Gauge/1 ksi IS Transducer (750 psi MROP) <sup>8</sup>
Q	2,000 psi Gauge/3 ksi IS Transducer (1,500 psi MROP) <sup>8</sup>
R	3,000 psi Gauge/3 ksi IS Transducer (1,880 psi MROP) <sup>8</sup>

T - Heating and Cooling <sup>9</sup>	
0	None
1	Electric 120 VAC, Single Phase
2	Electric 240 VAC, Single Phase
3	120 VAC, Purgeable Furnace
4	240 VAC, Purgeable Furnace
5	Baffled Removable Jacket, 1/4" FNPT Connections 450°F (232°C) Maximum <sup>2</sup>

U - Gas Inlet	
0	None, Plugged Connection
1	Gas Inlet Line with One (1) Manual Valve
2	Gas Inlet Line with Two (2) Manual Valve (Shared Connection)
3	Forward Pressure Regulation (FPR) - Digital 120VAC
4	Forward Pressure Regulation (FPR) - Digital 240 VAC

V - Charging Valve	
0	None, Plugged Connection
1	3/8" Manual Charging Valve
2	Manual Valve with 8cc Charging Cartridge
3	Manual Valve with 20cc Charging Cartridge
4	Reflux Condensor

## WARNING

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