

Mini-Reactor

25, 50, 100, and 150 ml

Volumes: 25, 50, 100, and 150 ml

Maximum Allowable Working Pressure: 2,900 psi @ 600°F (200 bar @ 315°C)

Material of Construction: 316 Stainless Steel, Hastelloy® C276

Applications: Chemical, Petrochemical, Catalyst & Reaction, Kinetics Screening, Fischer-Tropsch, Hydrogenation.



Principle of Operation:

The Parker Autoclave Engineers' Mini-Reactor is a highly capable design incorporating all features found in a full size laboratory reactor at reduced internal volumes. The low cost of full features makes the Mini-Reactor ideal for parallel studies. Lower volume reduces both reactant requirements and disposal costs. A smaller foot print reduces costly laboratory and fume hood requirements.

The 25, 50, 100, and 150 ml volumes share the same closure geometry and are interchangeable. The elastomer seal allows the Mini-Reactor to achieve high pressure with a finger-tight seal mechanism.

General Specifications:

Maximum Allowable Working Pressure: (MAWP)

2,900 psi @ 600°F* (200 Bar @ 315°C*)

Minimum Design Metal Temperature: (MDMT)

-20°F @ 2,900 psi (-29°C @ 200 Bar)

Maximum Recommended Operating Pressure: (MROP)

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

Critical Dimensions

	25 ml	50 ml	100 ml	150 ml
Inside Diameter	1.13" (28 mm)	1.38" (35 mm)	1.38" (35 mm)	1.63" (41 mm)
Inside Length	2.03" (51 mm)	2.41" (61 mm)	4.66" (118 mm)	4.66" (118 mm)

Approximate Dimensions

	1/25 HP Motor & Air Motor	1/10 HP Motor
Overall Height	22" (553 mm)	24" (598 mm)
Width	10" (254 mm)	10" (254 mm)
Depth	12.25" (311 mm)	12.25" (311 mm)

* 600°F (315°C) rating is mean wall temperature. Actual process temperature will be lower. Temperature rating is dictated by the O-ring seal selected. See the Ordering Guide for details. The Mini-Reactor uses Parker Autoclave Engineers Mini-Valve Series and Tubing

MagneDrive III Agitator

- In-Line motor eliminates belts, reduces size, and creates nearly silent operation.
- Compact design with up to 5 in-lb (565 N-mm) of static torque.
- Designed for simple disassembly and maintenance. Bearings can be changed in seconds from top or bottom



MagneDrive III



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Connection Schedule:

All of the connections indicated below will be provided. If any accessory is not ordered, the corresponding connection will be plugged.

Opening	Purpose	External	Location
A	Pressure Gauge/Gas Inlet	SW125	Cover
B	Safety Head/Vent	SW125	Cover
C & E	Cooling Coil	SW125 Adapted to 1/8" FNPT	Cover
D	Thermocouple	SW125	Cover
F	Pressure Transducer/Blow Pipe/Liquid Sample	SW125	Cover
G	Process	SW125	Body Bottom

Technical Specifications:

Parker Autoclave Engineers provides a variety of optional accessories to custom configure your reactor. See the [Mini-Reactor Ordering Guide](#) on the back cover to configure a reactor for your specific application.

Seal Materials: Nitrile, EPR, PTFE Encapsulated FKM, FKM, Silicone, Kalrez®, Chemraz®

Approvals: ASME Code Stamp, CE Mark, Canadian Registration

Stand: Bench Top

Body Lift: Not required

Agitator: MagneDrive® III agitator with 5 in-lbs of static torque.

Motors: 1/25 Hp DC variable speed, 1/10 Hp DC variable speed or air motor

Impeller Styles: AE Dispersimax® & Turbine (6-blade), Axial up & Axial down (4-blade)

Speed Sensor: General Purpose

Heating: 25 ml 50 ml 100 ml 150 ml

120V or 240V Electric Furnace: 200 Watt 200 Watt 400 Watt 400 Watt

Jacket: Removable, baffled with FKM O-ring seals and 1/8" NPT connections.

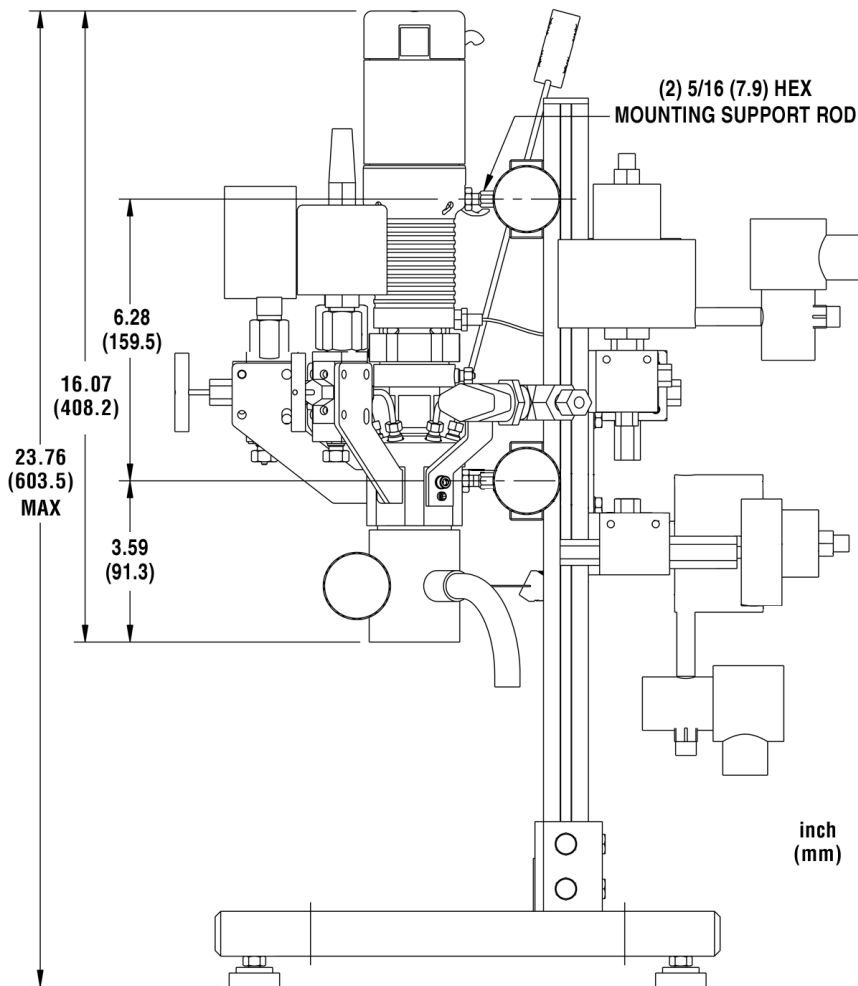
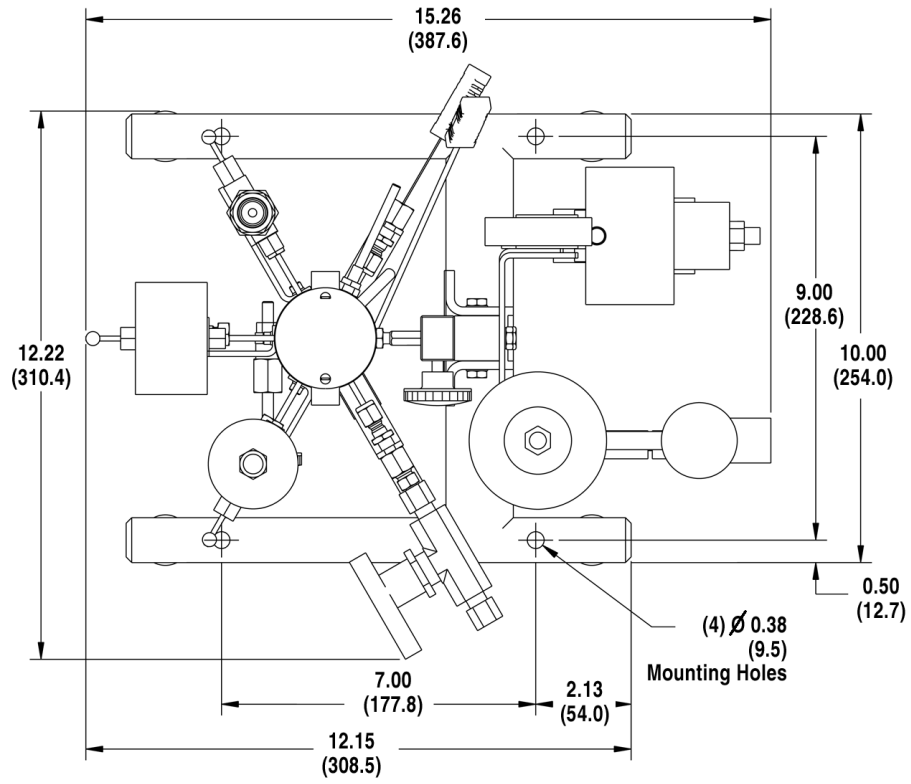
Internal Accessories	External Accessories
<ul style="list-style-type: none"> Liquid Sample Tube with Filter: 1/8" Valve Blow Pipe, 1/8" Valve Cooling Coil Process Thermocouple Type K 	<ul style="list-style-type: none"> Gas inlet, 1/8" Valve Vent Valve, 1/8" 2.5" (63.5 mm) Dial Pressure Gauge - Multiple ranges available Pressure Transducer - Range dependent on gauge External Thermocouple Type K Forward Pressure Regulation (FPR) or Back Pressure Regulation (BPR), digital

Supporting Information:

Please refer to the following sections of the catalog for complimentary products and additional technical details.

Mini-Reactor Drawings			
316 Stainless Steel		Hastelloy C	
25 ml	Dwg. 40A-9939	25 ml	Dwg. 40A-9940
50 ml	Dwg. 40A-9752	50 ml	Dwg. 40A-9824
100 ml	Dwg. 40A-9753	100 ml	Dwg. 40A-9825
150 ml	Dwg. 40C-0356	150 ml	Dwg. 40C-0357

Drawing Details:



Note:
Dimensions Shown
for the 25 ml Unit.

Ordering Guide:

Volume				Pressure Vessel						MagneDrive					Internal Accessories				External Accessories					
M	0	0	2	S	S	B	3	1	1	0	E	1	1	8	A	3	1	0	1	1	D	1	1	0
Base Reactor				A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R	S	T	U	V	

Part Number Example: **M002SSB3110E118A31011D110** (example selections indicated in yellow below)

Base Reactors	
M002	25ml Mini-Reactor
M005	50ml Mini-Reactor
M010	100ml Mini-Reactor
M015	150ml Mini-Reactor

A - Vessel Material	
SS	316 Stainless Steel
HC	Hastelloy®1 C-276

B - Seal Material *	
B	Nitrile O-ring (Max. Temp. 250°F/121°C)
C	Ethylene-Propylene O-ring (Max. Temp. 300°F/149°C)
D	PTFE (PTFE Encapsulated FKM) (Max. Temp. 400°F / 204°C)
E	FKM (Max. Temp. 450°F /232°C)
F	Silicone (Max. Temp. 450°F /232°C)
G	Kalrez®3 (Max. Temp. 600°F /315°C)
H	Chemraz®4 (Max. Temp. 600°F /315°C)

C - Body Bottom Connection	
0	None (No Connection)
3	1/8" SpeedBite

D - Approvals Available	
0	None Required
1	ASME Code Stamp
2	CE Mark and PED
3	Canadian Registration

E - Stand	
0	None
1	Bench Top

F - Body Lift Mechanism	
0	None

G - MagneDrive® Agitator	
E	In-Line MagneDrive® III

H - Bearings	
1	Purebon ⁵
2	Fluoropolymer with Graphite Fiber ⁶

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

K - Motor	
8	DC 1/25 Hp
9	DC 1/10 Hp
F	Air, Manual Speed Adjust
G	Air, Electronic Speed Adjust

L - Impellers / Shaft / Baffles	
A	Dispersimax™ (6 blades)
B	Turbine (6 blades)
C	Axial-Up (4 blades)
D	Axial-Down (4 blades)
E	Hollow Shaft with Baffle
F	Solid Shaft with Baffle
G	Robinson-Mahoney Catalytic Internals

M - Liquid Sample **	
0	None, Plugged Connection
1	Sample Tube Only
2	Sample Tube with Manual Valve
3	Sample Port to Transducer
5	Sample Tube with Manual Valve and Filter

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

O - Sparge Tube	
0	None

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

R - Vent Valve	
0	None, Plugged Connection
1	Vent with Manual Valve
4	BPR Digital Valve (120 VAC)
5	BPR Digital Valve (240 VAC)

S - Pressure Gauge/Transducer (M.R.O.P +)	
A	0-600 psi Gauge (450 psi) +
B	0-1,000 psi Gauge (750 psi) +
C	0-2,000 psi Gauge (1,500 psi) +
D	0-3,000 psi Gauge (2,250 psi) +
E	0-5,000 psi Gauge (2,500 psi) +
G	0-600 psi Gauge & 1kpsi Transducer (450 psi) +
H	0-1,000 psi Gauge & 1kpsi Transducer (750 psi) +
J	0-2,000 psi Gauge & 3kpsi Transducer (1,500 psi) +
K	0-3,000 psi Gauge & Transducer (2,250 psi) +
L	0-5,000 psi Gauge & Transducer (2,500 psi) +

T - Heating and Cooling ⁷	
0	None
1	120 VAC Furnace
2	220 VAC Furnace
3	Purgable Electric 120V
4	Purgable Electric 240V
5	Baffled Removable Jacket

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

V - Charging Valve	
0	None

NOTES:

- HASTELOY® 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 Dow Elastomers.
- Chemraz® is a registered trademark of Greene, Tweed.
- Purebon® is a registered trademark of Morgan AM & T Inc.
- Fluoropolymer bearings have a maximum recommended service temperature of 500°F (260°C).
- When heating/cooling are selected, the reactor is supplied with process Type K Thermocouple and external Type K Thermocouple. When NO heating/cooling is selected, the reactor will be supplied with a plugged connection for the process thermocouple.

Standard Equipment Included

- * Temperature limits are suggested. Actual performance will vary.
- ** Choose either sample tube or blow pipe.
- + MROP= Maximum Recommended Operating Pressure
MROP may be further reduced by temperature and number of cycles.

WARNING

FAILURE, IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

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Caution! Do not mix or interchange component parts or tubing with those of other manufacturers. Doing so is unsafe and will void warranty.

Caution! Parker Autoclave Engineers Valves, Fittings, and Tools are not designed to interface with common commercial instrument tubing and are designed to only connect with tubing manufactured to Parker Autoclave Engineers AES specifications. Failure to do so is unsafe and will void warranty.

Bulletin SR-MR-25/50/100/150

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