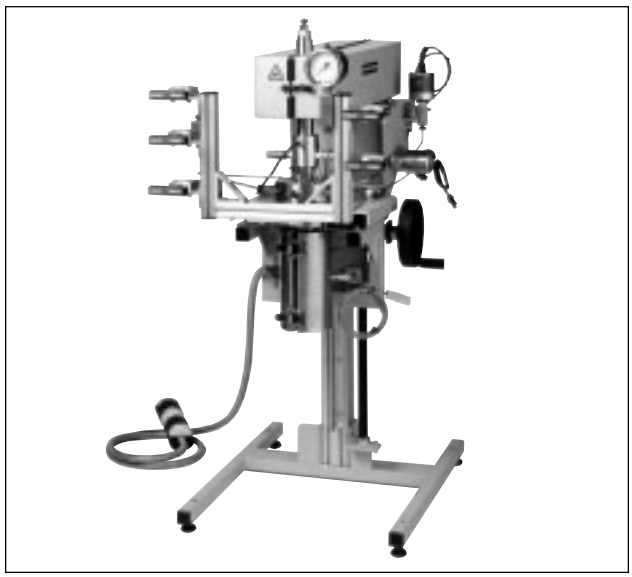
Autoclave Engineers
Division of Snap-tite, Inc.

Autoclave Engineers
Providing Tools for Research and Industry

1,000 ml Bolted Closure Stirred Reactor



At a Glance

Volume:	1,000 ml
Vessel MAWP:	5,500 psi @ 650° F
(Design Pressure)	(379 Bar @ 343° C)
Material of Construction:	316 Stainless Steel or HASTELLOY® C-276

Principle of Operation

The Autoclave Engineers' Bolted Closure Reactor has been designed for reliable high pressure operation. The seal is a metal gasket machined from the same material as the vessel. 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)
5,500 psi @ 650° F*
(379 Bar @ 343° C)*

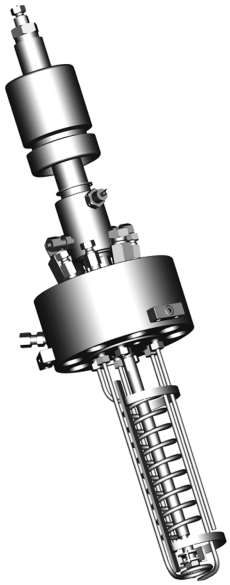
Minimum Design Metal Temperature (MDMT)
-20° F @ 5,500 psi
(-29° C @ 379 Bar)

Maximum Recommended Operating Pressure (MROP)
varies based on gauge, transducer, and rupture disk selection.
Refer to Ordering Guide for Details.

Critical Dimensions:	1,000 ml
Inside Diameter:	3.0" (76 mm)
Straight Wall:	8.71" (221 mm)

Approximate Dimensions:	Tall Bench Top	Floor Stand
Overall Height**	39.4" (1002 mm)	61.8" (1570 mm)
Width:	20.5" (522 mm)	25.0" (635 mm)
Depth:	26.2" (665 mm)	26.5" (665 mm)

* 650° F (343° C) rating is vessel mean wall temperature. Actual Process temperature will be lower.
** Overall height based on belt driven units. For actuals see standard drawings.



1,000 ml Bolted Closure Reactor Internals

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 "Topside Of Cover" connection listed below.

Opening Label	Purpose	Opening or feature description on underside of cover	Opening or feature description on topside of cover	Entry Point	Smallest diameter orfice (nominal) in flow path
"A"	Charging Port	0.375" port	3/8" O.D. tube	Cover top	0.25"
"B"	Gas Inlet	3/16" O.D. tube	1/8" O.D. tube	Cover side	0.062"
"C"	Sparge Tube†	3/16" O.D. tube	1/8" O.D. tube	Cover side	0.031"†
"D" & "H"	Cooling Coil	3/16" O.D. tube	1/4" O.D. tube	Cover side	0.125"
"E"	Vent and Pressure Indication	Branched into "F"	1/8" O.D. tube	Cover side	0.062"
"F"	Safety Head	0.187" port	1/8" FNPT	Cover top	0.187"
"G"	Thermowell‡	1/8" O.D. tube	3/32" Port‡	Cover top	N/A
"J"	Blow Pipe	3/16" O.D. tube	1/8" O.D. tube	Cover side	0.062"
"K"	Liquid Sample	3/16" O.D. tube	1/8" O.D. tube	Cover side	0.062"
"L"	MagneDrive® Agitator	1/2" O.D. Mixing Shaft	MagneDrive®	Cover top	N/A

† 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 1/8" O.D. and 1/16" I.D. with a plug in the end. A 3/32" port is drilled in the cover to guide the thermocouple to the opening in the thermowell.

Stirred Reactors

1000 ml Bolted Closure Stirred Reactors Technical Specifications

Autoclave Engineers provides a variety of optional accessories to custom configure each reactor. See the Bolted Closure Stirred Reactor Ordering Guide to configure a reactor for a specific application.

Seal Materials:	Metal Gasket (vessel material), Buna-N, Ethylene-Propylene, PTFE, Viton®, Silicone, or Kalrez® O-rings.
Approvals:	Optional ASME code stamp, Canadian Registration or CE Mark.
Stand:	Tall Bench Top or Floor Stand
Body Lift:	None or Manual Jack.
Agitator:	3300 RPM rated MagneDrive® MAG075-01 Series with 7 in•lb (0.79 N•m) static torque, carbon/graphite bearings, or 3300 RPM rated MagneDrive® MAG075-02 Series with 16 in•lb (1.8 N•m) static torque, carbon/graphite 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) CE Mark. 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. (Supply with 35 SCFM of 40 psi compressed air minimum) 1/2 HP (0.37 kW) Explosion-proof AC for 230 - 400 VAC 3 phase, 50 Hz, Inverter duty (variable frequency) CE Mark.
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, or Intrinsically-Safe Magnetic Sensor (Barrier Required)
Heating:	Furnaces: 120 VAC, Single Phase or 240 VAC, Single Phase; 1,700 Watt Jacket: Removable, Spiral Baffle with O-Ring Seals.

Internal Accessories Available:

Liquid sample tube w or w/o valve (1/8" O.D. tube)
Blow pipe w or w/o valve (1/8" O.D. tube)
Sparge tube w or w/o valve (1/8" O.D. tube)
Cooling coil w or w/o valve (1/8" O.D. tube)
Process Thermocouple, Type J or K

External Accessories Available:

Vent Valve (1/8" O.D. tube)
2.5" (63.5mm) Dial Pressure Gauge - (Multiple ranges available)
Pressure transducers - range dependent on gauge
Inlet valves, (1/8" O.D. tube) either one or two on a shared connection
Catalyst charging valve 3/8" O.D. tube, 1/4" full bore opening
External thermocouple type J or K
1/2" Centered bottom port with manual valve, flush bottom design (requires floor stand)
Bottom port 3/16" (centered AE F-437-FB connection)

Supporting Information

Please refer to the following sections of the catalog for complimentary products and additional technical details. If your catalog is incomplete or out-of-date, feel free to register your name and download literature from Autoclave Engineers website. A good starting point is http://www.snap-tite.com/divisions/ae/aed-index.html to reach the main page of Autoclave Engineers reactor products.

- "Bolted Closure Stirred Reactor Ordering Guide" - Provides a step-by-step guide on how to configure the Bolted Closure Reactor to a specific application.
- "Instrumentation" - Details Autoclave Engineers' full line of control options for temperature, pressure, and speed.
- "Agitation" - Provides additional specifications on the MagneDrive® magnetic agitator and available impeller systems.
- "Pressure Vessels" - Provides details on the Bolted Closure vessel assembly.
- "Stirred Reactor Selection Guide" - Provides general information on all of Autoclave Engineers' stirred reactors

The following Engineering drawings are available upon request from Autoclave Engineers for more detailed technical information.
Drawing Number 40A-8362 Bench Top/Light Floor Motor Options (Air and DC motors)
Drawing Number 30B-0792 Belt Drive Assembly (AC motor)
Drawing Number 30A-9638 Manual Screw Jack Assembly

Drawing Number Tabulated by Material of Construction		Drawing Title
316 Stainless Steel	HASTELLOY® C-276	
40A-8545	40A-8684	Bench Top Bolted Closure General Arrangement
40A-8134	40A-8685	Light Duty Floor Stand Bolted Closure General Arrangement
40A-8533	40A-8621	1000 ml Bolted Closure Reactor
30A-9605	30B-0382	MAG 075 MagneDrive® Assembly
30A-9640	30B-0479	1/8" Valve Rack

Note: Autoclave Engineers, division of Snap-tite, Inc. reserves the right to substitute an equivalent material for trademarked material. Autoclave Engineers purchases substitute materials based on specification conformance, typically a widely accepted specification created by an industry standards organization.

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