

The World Leading Provider of High Pressure Equipment for Research and Industry since 1945!

100 & 300 ml

Bolted Closure Stirred Laboratory Reactor

At a Glance

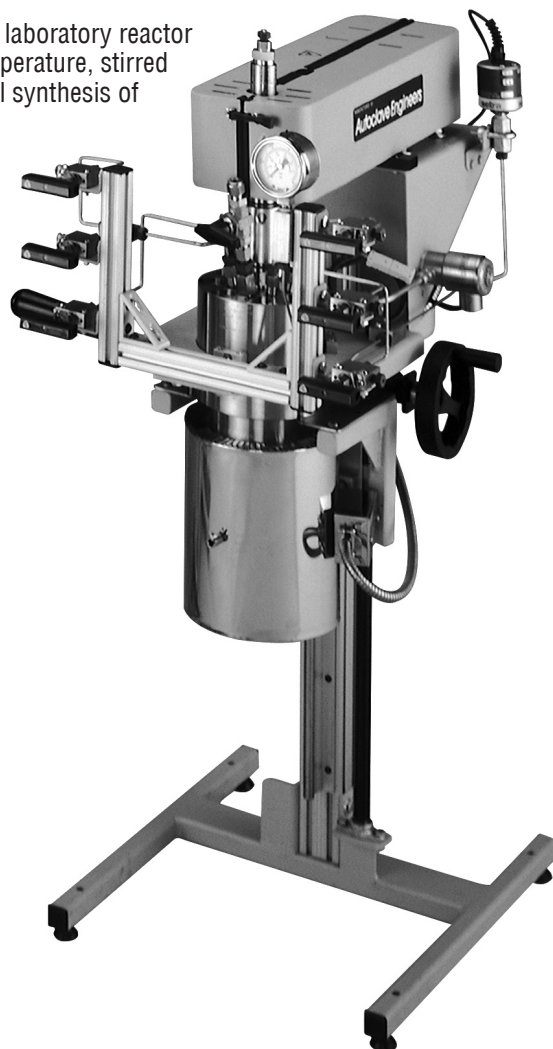
Volume: 100 ml & 300 ml

Material of

Construction: 316 Stainless Steel & Hastelloy® C-276

Design Pressure: 5,500 psi @ 650° F
(379 bar @ 343°C)

Applications: The bolted closure stirred laboratory reactor is a versatile high pressure and high temperature, stirred laboratory reactor. It is used for chemical synthesis of corrosive, hazardous and very reactive chemicals / petrochemicals as well as materials research.



**Autoclave
Engineers** 

Division of Snap-tite, Inc.

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.

Features

- Versatile product configuration
- Operating pressures as high as 4740 psi @ 650° F (327 bar @ 343° C)
- Open vessel and remove body without disassembling pressure connections
- Available worldwide to meet codes such as ASME, CE, and CRN.

General Specifications

Design Pressure

5,500 psi @ 650° F* (379 Bar @ 343° C)*

Minimum Design Metal Temperature (MDMT)

-20° F @ 5,500 psi (-29° C @ 379 Bar)

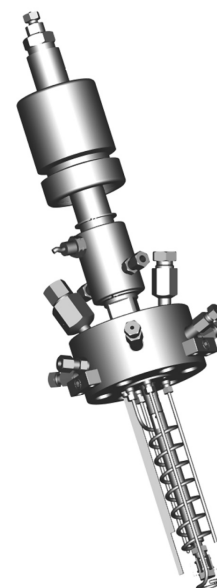
Maximum Operating Pressure (MOP)

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

| Critical Dimensions: | 100 ml | 300 ml |
|-------------------------|------------------------|-----------------------|
| Inside Diameter: | 1.81" (46mm) | 1.81" (46 mm) |
| Straight Wall: | 2.75" (70 mm) | 6.69" (170 mm) |
| Approximate Dimensions: | Short Bench Top | Tall Bench Top |
| Overall Height** | 34.8" (883 mm) | 39.4" (1002 mm) |
| Width: | 20.5" (522 mm) | 20.5" (522 mm) |
| Depth: | 26.2" (665 mm) | 26.2" (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.



300 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.

| Opening Label | Purpose | Opening or feature description on underside of cover | Opening or feature description on topside of cover | Entry Point | Smallest diameter orifice (nominal) in flow path |
|------------------|-------------------------------|--|--|-------------|--|
| A | Charging Port | 0.161" port | 3/8" O.D. Tube | Cover Top | 0.161" |
| B | Gas Inlet | Branched into A | 1/8" O.D. Tube | Cover Side | 0.062" |
| C | Blow Pipe or Sparge Tube† | 1/8" O.D. tube | 1/8" O.D. Tube | Cover Side | 0.062" 0.031"† |
| D & H | Cooling Coil | 1/8" O.D. tube | 1/4" O.D. Tube | Cover Side | 0.062" |
| E | Vent and Pressure Indication | Branched into F | 1/8" O.D. Tube | Cover Side | 0.062" |
| F | Safety Head | 0.161" port | 1/8" FNPT | Cover Top | 0.161" |
| G | Thermowell‡ | 1/8" O.D. tube | 3/32" Port‡ | Cover Top | N/A |
| J | Liquid Sample or Sparge Tube† | 1/8" O.D. tube | 1/8" O.D. Tube | Cover Side | 0.062" 0.031"† |
| K | MagneDrive® Agitator | 1/2" O.D. Mixing Shaft | MagneDrive® | Cover Top | N/A |

† The tube that forms the sparge tube is 1/8" O.D. and 1/16" 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.

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: Short Bench Top or Tall Bench Top

Body Lift: None or Manual Jack

Agitator: 3300 RPM rated MagneDrive® MAG075-01 Series with 7 in-lb (0.79 N-m) static torque. 3300 RPM rated MagneDrive® MAG075-02 Series with 16 in-lb (1.8 N-m) static torque, carbon/graphite bearings or Fluoropolymer with graphite fiber.

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).

Impeller Styles: AE Dispersimax, Straight Turbine, Axial Flow-Up, or Axial Flow-Down; All 7/8 inch (22.2 mm) diameter.

Baffle: One (1) Single Blade Baffle attached to the top cover is included.

Speed Sensor: General Purpose or Intrinsically-Safe Magnetic Sensor (Barrier Required).

Heating: Furnaces: 120 VAC, Single Phase or 240 VAC, Single Phase; 1,200 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
Bottom port 3/16" (centered AE F437FB connection)

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

| Drawings | | | | Drawing Title |
|---------------------|----------|------------------|----------|--|
| 316 Stainless Steel | | Hastelloy® C-276 | | |
| 100ml | 300ml | 100ml | 300ml | |
| 40C-0525 | 40A-8545 | 40C-0439 | 40A-8684 | Bench Top Bolted Closure General Arrangement |
| | 40A-8521 | | 40A-8636 | Bolted Closure Reactor |
| 30A-9605 | 30A-9605 | 30B-0382 | 30A-0382 | MAG 075 MagneDrive® Assembly |
| 30A-9640 | 30A-9640 | 30B-0479 | 30A-0479 | 1/8" Valve Rack |

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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 web site. A good starting point is www.autoclaveengineers.com 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

Supporting Information

