12ml Micro-Berty

Catalytic Packless Reactor:

Volume: 12 ml
Vessel MAWP*: 5,000 psi @ 650ºF (345 bar @ 343ºC)
5,000 psi @ 1,000ºF (345 bar @ 538ºC)
Material of Construction: Hastelloy® C276 / Body, Housing, Basket

* Maximum Allowable Working Pressure

Principle of Operation:

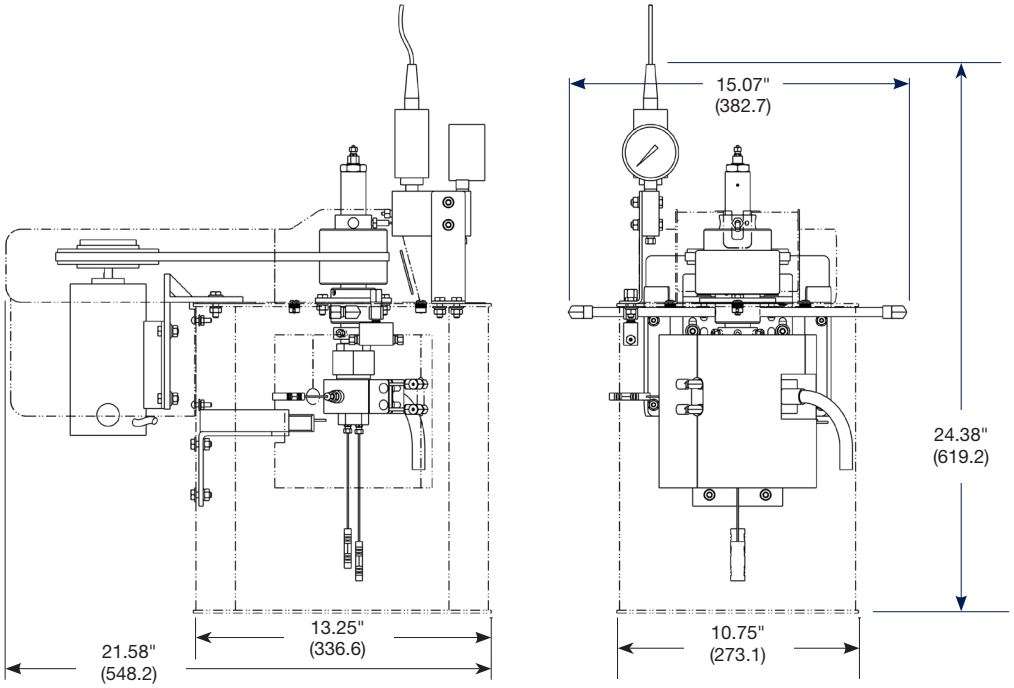
The Parker Autoclave Engineers' 12 ml Catalytic Packless Reactor with Berty internals is designed to provide all the benefits of small scale chemical research. It allows the research scientist to work with small quantities of catalyst and feedstocks which may be expensive and/or limited in availability. Reduced volumes are safer to work with and minimize waste disposal. In addition, the reduced volume of the 12 ml capacity has reduced dead volume, which minimizes side thermal reactions. The role of the catalyst thus may be more clearly tested.

The catalyst basket design lends itself to easy loading and discharge of catalyst pellets. It is patterned after the larger proven Berty basket reactor currently available in 3" and 5" capacity vessels. Facilitating tomorrows requirements in a small proven stirred reactor package for University and Research facilities the world over.

Features:

- Maximum blower speed of 5,000 rpm
- Operating pressures as high as 5,000 psi @ 1,000ºF (345 bar @ 538ºC)
- Hydrostatic test pressures: 7,000 psi @ room temperature, 8,700 psi @ room temperature (Hi-Temp Units)

Dimensions:



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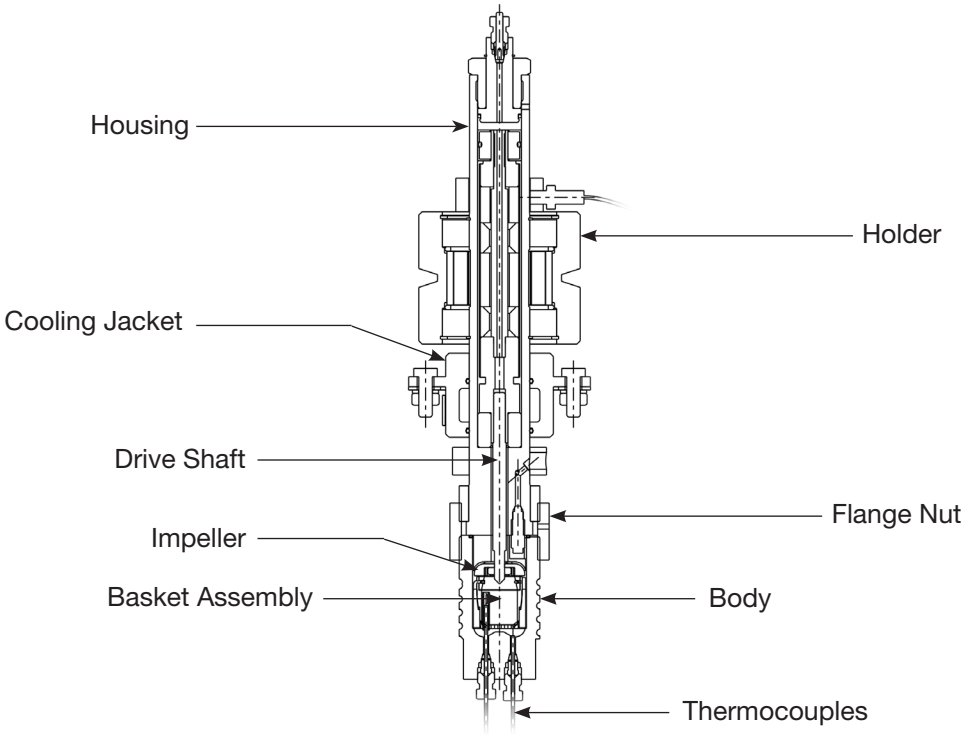
Standard Equipment:

The micro catalytic reactor internal parts are designed to be used in a standard MicroClave® assembly with minimal changes. A complete assembly is available as a standard unit or a retrofit package can be purchased to convert an existing MicroClave® into a catalytic reactor.

Micro Reactor Vessel:	Confined gasket closure employs flange nut to lock body and housing. Body, housing, and flange nut are Hastelloy C-276
Sealing Gasket:	Confined gasket of silver-plated Inconel-X is designed for temperatures to 650ºF. The high temperature unit uses a gold-plated metal seal rated at 1,000ºF
Cover:	Cover is integral with the MagneDrive housing.
Capacity:	Usable capacity with reactor internals in place is 12ml
Connection Collar Openings:	Standard openings include: • One 1/8" connection for safety head and pressure gauge • One thermowell • One sample tube • Two inlet/outlet charging connections
Body Openings:	• Two bottom connections: Thermocouples
Purge Connection:	1/8" (SW125) gas connection at top of MagneDrive allows for introduction of gas into the vessel.
Pressure Gauge:	Constant reading gauge has 2-1/2" diameter dial with Monel Bourdon tube. Dual face dial reads 0-7500 psi and 517 bar.
Safety Head Assembly:	Hastelloy-C safety head uses 3/16" flat rupture disc rated 4,781-5,000 psig @ 72ºF, with 1/8" NPT female vent connection through top of bench stand to atmosphere.
Furnace:	External band-type electric furnace. 120 or 240VAC single phase.
Cooling Coil:	External cooling coil can be used for water or air cooling. Type 304 SS coil permits rapid vessel cooling and temperature control.
MagneDrive Packless Drive System:	The AE Micro-Berty features a packless MagneDrive system. Rare earth magnetics provide high torque mixing capability. Packless magnetic-drive system eliminates leakage, contamination and packing heat generation problems of conventional mixers. It provides continuous high speed rotary agitation without the danger of leakage or the downtime to change worn packing.
Mixing System:	MagneDrive rotary impeller system. Static torque 6 in·lbs; net mixing horsepower 0.5 @ 5,000 rpm. Special impeller for maximum dispersion.
Available with electric or air motor:	Electric: Variable speed rated 1/4 HP @ 3,450 rpm. Type TENV GP with 120V or 240V. Air: HP to 0.5 @ 6,000 rpm. Required air pressure 80 psig @ 27 cfm maximum.

12ml Catalytic Packless Reactor with Micro-Berty Basket:



Technical Specifications:

This internal recycle reactor is designed with a fixed, circular, screened catalyst bed and a top mounted vane type blower. Fluid circulation is directed downward along the vessel wall and deflected upward through the catalyst bed.

Reactants: Gas/Solids. Vapor/Solids

Typical Reactions: Oxidation, hydrogenation, catalyst testing

Basket Screen: 50x50 mesh, 0.009” (0.23 mm) wire and a nominal opening size of 0.011” (0.28 mm)

Inside Diameter: 1” (25.4 mm)

Basket Volume: 0.22 $in.^3$ (3.6 cm^3)

Free Volume: 0.94 $in.^3$ (15.4 cm^3)

Maximum Allowable Working Pressure: 5,000 psig (345 bar)

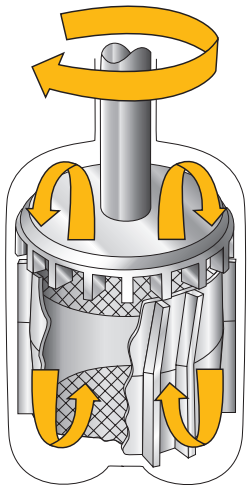
Maximum Blower Speed: 5,000 RPM

Version: **High Temperature** - 1,000°F (538°C)
Catalog Number Prefix: CRBHT

Standard Temperature - 650°F (343°C)
Catalog Number Prefix: CRB2HC

Common Customization: Special wire mesh size, special materials, specific pressure/temperature ratings. ASME code stamp (or CE mark for pressure equipment Directive)

Standard Material: Hastelloy® C-276



Ordering Guide:

The following reactor assemblies include motor, thermocouples, and electrically heated 1,400ºF (760ºC) maximum furnace (for the voltage specified in the table). Be advised, motor controls, tachometer display, furnace controls and the display for the thermocouple are purchased as separate items. The Specifications and descriptions found in the drawings referenced in the table below supercede the specification information found in this guide. Consult factory for more information.

Catalog Number	Description SS=ANSI 316 Stainless Steel HC=Hastelloy® C-276	Motor	Power Source	Temperature Rating	General Arrangement Drawing Number	Reactor Subassembly Drawing Number	Weight lbs.
CRB2HC05ZH16A	Micro Berty Reactor 12 cc HC	Air	120V	650ºF (343ºC)	40A-3174	40A-3173	47
CRB2HC05ZH16D	Micro Berty Reactor 12 cc HC	DC	120V	650ºF (343ºC)	40A-3175	40A-3173	62
CRBHT2HC05ZH16D	Micro Berty Reactor 12 cc HC	DC	120V	1000ºF (538ºC)	40A-7791	-	62
CRB2HC05ZH26A	Micro Berty Reactor 12 cc HC	Air	240V	650ºF (343ºC)	40A-3174	40A-3173	47
CRB2HC05ZH26D	Micro Berty Reactor 12 cc HC	DC	240V	650ºF (343ºC)	40A-3175	40A-3173	62
CRBHT2HC05ZH26D	Micro Berty Reactor 12 cc HC	DC	240V	1000ºF (538ºC)	40A-7791	-	62

NOTES:
The circulating pressure generated by the impellers in the “Micro Series” reactors is low.
Parker Autoclave Engineers makes no claims about the ability to scale-up or correlate “Micro Series” catalytic reactors with any other process equipment.

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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, Systems, 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.

Instrumentation Products Division
Autoclave Engineers Operation
8325 Hessinger Drive
Erie, PA 16509-4679
Tel: 814 860 5700 • Fax: 814 860 5718
www.AutoclaveEngineers.com

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