

# 50 ml MicroClave™

## Packless Reactor

**Volume:** 50 ml

**Vessel MAWP\*:** 5,000 psi @ 650°F (345 bar @ 343°C)  
5,000 psi @ 1,000°F (345 bar @ 538°C)

**Material of Construction:** Hastelloy® C276 / Body, Housing, Flange Nut

\* Maximum Allowable Working Pressure



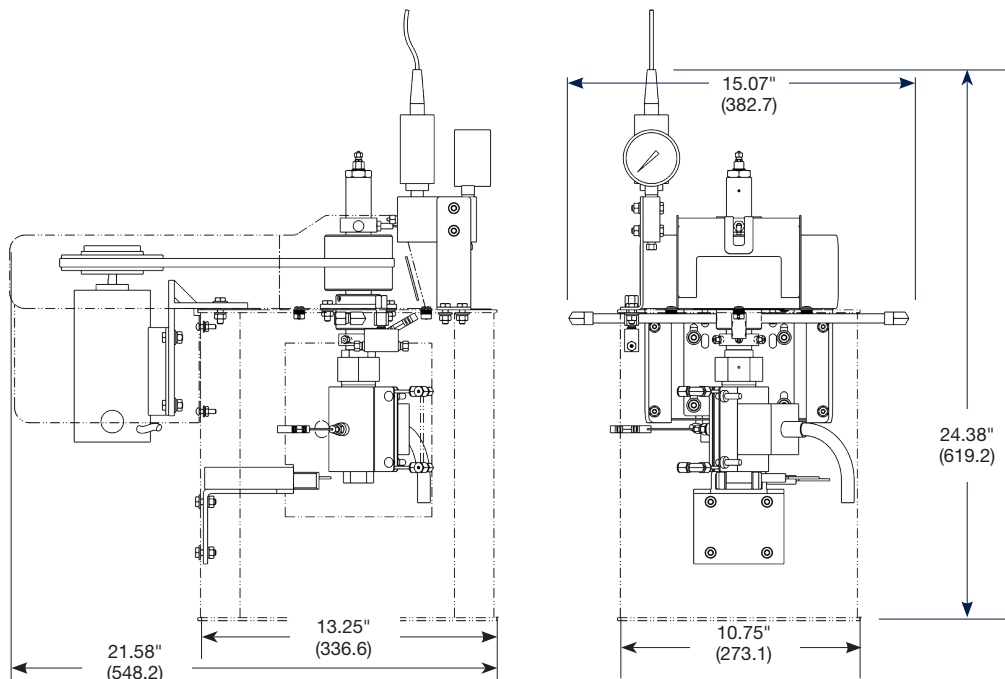
### Principle of Operation:

The Parker Autoclave Engineers' 50 ml MicroClave™ reactor is a miniature, high pressure & high temperature, laboratory batch reactor. It is used for chemical synthesis of corrosive, hazardous & very reactive chemicals as well as catalyst 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. The MicroClave™ can be used as a catalyst reactor, multi-phase reactor, and adiabatic reactor using minimal amount of material and creating a minimum in waste. Complete high-pressure chemistry in a bench-scale apparatus.

### Features:

- Maximum operating speed of 5,000 rpm
- Operating pressures as high as 5,000 psi (345 bar) and temperatures as high as 1000°F (538°C)

### Dimensions:



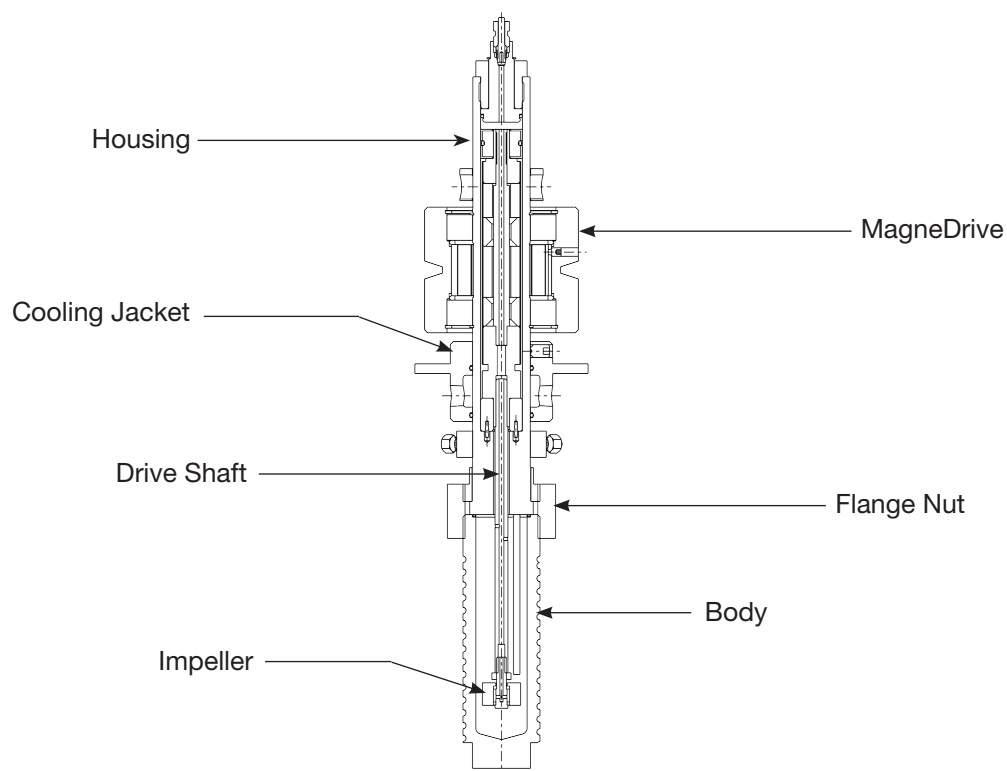
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## Standard Equipment:

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-Berty or Micro Robinson-Mahoney.

- Micro Reactor Vessel:** Confined gasket closure employs a 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 750 is designed for temperatures to 650°F. The high temperature unit uses a gold-plated metal seal rated at 1,000°F
- Cover:** Cover is integral with the MagneDrive housing.
- Capacity:** Usable capacity is 50ml
- Connection Collar Openings:** Standard openings include:
- One connection for safety head and pressure gauge
  - One thermowell entrance
  - One sample tube
  - Two inlet/outlet charging connections
- 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 (upstream) uses 3/16" flat rupture disc rated 4,750-5,000 psig @ 72°F, with 1/8" NPT female vent connection through top of bench stand to atmosphere.
- Furnace:** External electric furnace. 120 or 240VAC single phase.
- Cooling Coil:** External cooling coil can be used for water or air cooling. Stainless Steel coil permits rapid vessel cooling and temperature control.
- MagneDrive Packless Drive System:** The AE MicroClave 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 0.5 HP @ 5,000 rpm. Standard Dispersimax® impeller draws headspace gas & vapors into the liquid; other impellers are offered.
- Available with electric or air motor:** Electric: Variable speed rated 1/4 HP @ 3,450 rpm. 90 VDC or 180 VDC. Air: 1.7 HP @ 3,000 rpm. Required air pressure 100 psig @ 72 cfm maximum.

## 50ml MicroClave Packless Reactor:



### Technical Specifications:

**Reactants:** Gas/Vapors/ Liquids/Solids

**Typical Reactions:** Oxidation, hydrogenation, catalyst testing

**Inside Diameter:** 1" (25.4 mm)

**Inside Length:** 4.4" (111.8 mm)

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

**Maximum Agitator Speed:** 5,000 RPM

**Version:** High Temperature - 1,000°F (538°C)  
Catalog Number Prefix: CRHT05

Standard Temperature - 650°F (343°C)  
Catalog Number Prefix: CR0005

**Common Customization:** Special materials  
Specific pressure/temperature ratings  
ASME code stamp, (CE mark for Pressure Equipment Directive)

**Standard Material:** Hastelloy® C-276

## Ordering Guide:

The following reactor assemblies include motor, thermocouples, and electrically heated 1,400°F (760°C) 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	Drawing Number	Weight lbs.
CR0005HC05ZH16A	MicroClave 50 cc HC	Air	120V	650°F (343°C)	40A-2139	77
CR0005HC05ZH16D	MicroClave 50 cc HC	DC	120V	650°F (343°C)	40A-2140	71
CRHT05HC05ZH16D	MicroClave 50 cc HC	DC	120V	1000°F (538°C)	40A-7719	79
CR0005HC05ZH26A	MicroClave 50 cc HC	Air	240V	650°F (343°C)	40A-2139	77
CR0005HC05ZH26D	MicroClave 50 cc HC	DC	240V	650°F (343°C)	40A-2140	71
CRHT05HC05ZH26D	MicroClave 50 cc HC	DC	240V	1000°F (538°C)	40A-7719	79

### 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.

### 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!** 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.

**Bulletin CR-MICROCLAVE**

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