### Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heating Rate</strong></td>
<td>2-6 °C/sec, end</td>
</tr>
<tr>
<td><strong>Temperature</strong></td>
<td>-80 to 300 °C</td>
</tr>
<tr>
<td><strong>Pressure</strong></td>
<td>0-30 bar (0-435 psi)</td>
</tr>
<tr>
<td><strong>Reflux Reaction Compliant</strong></td>
<td>Open vessel option included for reflux reactions</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>0-300 W</td>
</tr>
<tr>
<td><strong>Temperature Measurement</strong></td>
<td>Infrared for volume-independent non-invasive temperature measurement. Raman optic probe for direct feedback</td>
</tr>
<tr>
<td><strong>Operating Volume</strong></td>
<td>0.2 - 75 mL atmospheric, 0.2 - 50 mL pressurized</td>
</tr>
<tr>
<td><strong>Reaction Agitation</strong></td>
<td>Electromagnetic stirring with adjustable speeds</td>
</tr>
<tr>
<td><strong>Air Cooling</strong></td>
<td>≥25 psi (30 L/min flow) user-supplied</td>
</tr>
<tr>
<td><strong>Autoclave</strong></td>
<td>32-position (up to 12 (10 mL) vessels or 6 (35 mL) vessels) 48-position (up to 48 (10 mL) vessels or 24 (35 mL) vessels) 72-position (up to 72 (10 mL) vessels or 36 (35 mL) vessels) 96-position (up to 96 (10 mL) vessels or 48 (35 mL) vessels)</td>
</tr>
<tr>
<td><strong>Available Accessories</strong></td>
<td>Camera Camera CoolMate Sub-Ambient Microwave System Gas Addition kit Flow Cell Peptide Synthesis Module Enzymatic Digest</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>38 lbs (17.3 kg)</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>14.2&quot;W x 16.9&quot;D x 11.2&quot;H (36.1 cm x 42.9 cm x 28.4 cm)</td>
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THE BEST-SELLING MICROWAVE SYNTHESIS PLATFORM
takes another leap forward with Discover SP. This new system has all of the features for which the Discover series is known, plus an enhanced heating capability, and CEM’s new ActiVent Technology, all in one compact simple-to-operate system. As the most advanced technology designed for microwave synthesis, the Discover SP provides superior flexibility with easily interchangeable accessories that enable you to customize a system so you can do your chemistry, your way.

ENERGY EFFICIENT
Why use more power than you really need? Our patented cavity design compensates for:
- The changing chemical properties of the reaction and allows the optimum amount of microwave energy to reach the reaction to ensure safe heating
- Various working volumes, ranging from 0.2 to 75 mL, to remain optimally tuned

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CoolMate™
The CoolMate™ is the only commercially available microwave system designed to perform reactions at sub-ambient temperatures. Reactions such as lithiation, carbohydrate synthesis, and other temperature-sensitive chemistries can now benefit from the use of microwave energy. Use the power of microwave energy to accelerate reactions even at temperatures as low as -80 °C.

Gas Addition
The Gas Addition accessory is the only system specially designed for reactions with gaseous reagents. Perform hydrogenations, carbonylations, or other reactions with gaseous reagents or simply use the vessel to ensure an inert atmosphere during microwave irradiation. This system allows you to purge the reaction vessel and back-fill it with a gas. During the reaction, the gas source is completely shut off from the microwave, thereby ensuring your safety at all times.

Camera
The optional Integrated Camera allows you to see the changes occurring during your reaction. It’s the perfect tool for documentation and publication support.

ACCESSORIES
Fiber Optic Temperature Control provides the most precise temperature measurement available by directly measuring the temperature inside the reaction vessel. It can be used with 10 mL reaction vessels designed for this purpose, as well as with the 80 mL vessel. Other accessories, including the CoolMate™ and Gas Addition Kit use this type of temperature measurement.
EXPLORER SP AUTOMATION

Optimize your reactions and expand the capabilities of your laboratory without expanding your lab space. Explorer modules for the Discover SP platform provide fully automated reaction handling capabilities and are an ideal solution to support small groups of chemists as a shared resource.

**Explorer 12 Hybrid**

All of the benefits of a large format autosampler within the footprint of the world’s smallest manual reactor. This 12-position autosampler accommodates both the 10 and 35 mL vessels and is the best value of any autosampler commercially available.

**Explorer 48, 72, & 96**

CEM manufactures autosamplers to accommodate both 10 and 35 mL sealed vessels. Run either size or a combination of both easily. Intelligent rack design allows the autosampler to recognize the vessel type without user input and the integrated robotics ensure that switching between 10 mL and 35 mL reaction vessels occurs seamlessly, freeing your time for other things.

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**ActiVent™ Technology**
Control your reaction in more ways than ever before.

CEM’s patented ActiVent™ Technology is the latest advance in automated pressure control and the safest way to perform pressurized reactions. The ActiVent pressure control system was designed to work exclusively with ActiVent vessels and caps to give you greater flexibility in pressure control and optimum results.

**Vent as your reaction progresses or after it is complete**
- Perform high temperature/high pressure reactions using either parameter to safely and effectively control the reaction without venting.
- Automatically program the system to release a gaseous byproduct as it forms.
- Ultimate programmability for your reaction. Any material that is released is vented safely through exhaust tubing to a location specified by you.

**Vent more effectively during a reaction**
- Release unexpected pressure quickly and safely, allowing the reaction to proceed to completion.
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**Superior Design for Simple Operation**

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Self-Tuning Cavity

Self-Tuning Cavity takes all of the guesswork out of ensuring that your reaction is positioned correctly every time, no matter which vessel you use. As the reaction progresses, the microwave energy distribution adjusts automatically for changing chemical properties to optimally heat the reaction.

Focused Microwave Cavity

Focused Microwave Cavity is the core of the Discover System. Built around the largest single mode cavity available, the Discover System’s circular waveguide efficiently uses up to 300 W of power.

Volume Independent IR Temperature Sensor

Volume Independent IR Temperature Sensor provides the simplest means to measure the temperature in a reaction in a non-invasive manner. No need for multiple reaction vessels or large minimum volumes with the IR mounted on the bottom.

Simple Integrated Attenuator Design

Simple Integrated Attenuator Design allows full access to the Discover cavity to simplify cleaning process and provide the ultimate flexibility in vessel selection.

ActiVent™ Pressure Device

Programmable reaction venting to relieve gaseous by-products and reduce vial failures.

300-mL Cavity

Discover has the largest single-mode cavity available, providing unprecedented access and vessel flexibility. It is lined with a spill cup to protect the IR and make clean up easy.

Air Cooling for Simultaneous Heating and Reaction Quenching

Electromagnetic Stirring to ensure maximum agitation for your reaction mixture. Adjust the speed to guarantee your sample mixes each and every time.

Air Cooling for Simultaneous Heating and Reaction Quenching quickly reduces the overall reaction temperature to quench the reaction upon completion. Air cooling is also the critical component behind PowerMAX™ Technology.

PowerMAX™ Simultaneous Cooling

CEM’s patented PowerMAX technology uses compressed gas to cool the reactant mixture while simultaneously applying more energy than would normally be used. Reactions proceed much more quickly than normal and do not have time to form side products. This technology is ideal for reactions that require a substantial amount of energy, but may be temperature-sensitive.

Durable Design

An advanced membrane design and specially formulated coating protects parts from solvents and reagents.

Easiest to Clean

Discover SP is designed with a removable spill cup, as well as a drain tray for easy clean up. There’s nothing to disassemble, just clean out the cup and the tray and you’re ready to run another reaction.

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Advantages of Open Vessel:

- Use standard glassware
- Work on a larger scale
- No risk of pressure build-up
- Easy access to reaction for reagent addition or reaction sampling
- Use of overhead stirring for viscous mixtures


Perform either pressurized reactions in 10, 35, or 80 mL vials or non-pressurized reactions in standard laboratory glassware up to 125 mL round-bottom flask. Continuous flow vessels are also available.

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Open Vessel Reactions

Discover SP is the only single-mode microwave synthesis system capable of also performing open vessel reactions using standard laboratory glassware and condensers. Discover SP accepts up to a 125 mL round-bottom flask and allows reagent addition and overhead stirring, it can be used with or without a reflux condenser. Temperature can be measured using either the built-in IR sensor or the optional Fiber Optic Temperature Control.

Easiest-to-Use Vessels

You can’t get any easier than CEM’s ActiVent™ Caps.

No Tools Required

Open Vessel

Use round-bottom flasks up to 125 mL
Self-Tuning Cavity takes all of the guesswork out of ensuring that your reaction is positioned correctly every time, no matter which vessel you use. As the reaction progresses, the microwave energy distribution adjusts automatically for changing chemical properties to optimally heat the reaction.

Focused Microwave Cavity is the core of the Discover System. Built around the largest single mode cavity available, the Discover System’s circular waveguide efficiently uses up to 300 W of power.

Volume Independent IR Temperature Sensor provides the simplest means to measure the temperature in a reaction in a non-invasive manner. No need for multiple reaction vessels or large minimum volumes with the IR mounted on the bottom.

PowerMAX™ Simultaneous Cooling uses compressed gas to cool the reactant mixture while simultaneously applying more energy than would normally be used. Reactions proceed much more quickly than normal and do not have time to form side products. This technology is ideal for reactions that require a substantial amount of energy, but may be temperature-sensitive.

Durable Design An advanced membrane design and specially formulated coating protects parts from solvents and reagents. Easiest to Clean Discover SP is designed with a removable spill cup, as well as a drain tray for easy clean up. There’s nothing to disassemble, just clean out the cup and the tray and you’re ready to run another reaction.

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Electromagnetic Stirring to ensure maximum agitation for your reaction mixture. Adjust the speed to guarantee your sample mixes each and every time.

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300-mL Cavity Discover has the largest single-mode cavity available, providing unprecedented access and vessel flexibility. It is lined with a spill cup to protect the IR and make clean up easy.

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Mix and match reaction vessel sizes for the ultimate in flexible reaction setup.

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Wolff-Kishner Reduction

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SPECIFICATIONS

HEATING RATE  2-6 °C/sec end
TEMPERATURE  -80 to 300 °C
PRESSURE  0-30 bar (0-435 psi)

REFLUX REACTION COMPLIANT  Open vessel option included for reflux reactions

POWER  0-300 W

TEMPERATURE MEASUREMENT  Infrared for volume-independent non-invasive temperature measurement. Fiber optic probe for direct feedback

OPERATING VOLUME  0.2 - 75 mL atmospheric
  0.2 - 50 mL pressurized

REACTION AGITATION  Electromagnetic stirring with adjustable speeds

AIR COOLING  ≥25 psi (20 L/min flow) user-supplied

AUTOMATION  12-position [up to 12 (10 mL) vessels or 6 (35 mL) vessels ]
  48-position [up to 48 (10 mL) vessels or 24 (35 mL) vessels ]
  72-position [up to 72 (10 mL) vessels or 36 (35 mL) vessels ]
  96-position [up to 96 (10 mL) vessels or 48 (35 mL) vessels ]

AVAILABLE ACCESSORIES  Camera
  CoolMate Sub-Ambient Microwave System
  Gas Addition kit
  Flow Cell
  Peptide Synthesis Module
  Enzymatic Digest

WEIGHT  38 lbs. (17.3 kg)

DIMENSIONS  14.2”W x 16.9”D x 11.2”H
  (36.1 cm x 42.9 cm x 28.4 cm)

CEM has been an ISO-certified facility since 1994.

CEM Corporation
P.O. Box 200
Matthews, NC 28106
United States
Tel: (800) 726-3331 [USA & Canada]
Tel: (704) 821-7015
Fax: (704) 821-7894
e-mail: info@cem.com
www.cem.com

FRANCE
CEM Wave S.A.S.
Immeuble Ariane
Domaine Technologique de Saclay
4, rue René Razel
91892 ORSAY Cedex
Tel: 33 (01) 69 35 57 80
Fax: 33 (01) 60 19 64 91
e-mail: info.fr@cem.com
www.cemfrance.fr

GERMANY
CEM GmbH
Carl-Friedrich-Gauss -Str. 9
47475 Kamp-Lintfort
Tel: (49) 2842-9644-0
Fax: (49) 2842-9644-11
e-mail: info@cem.de
www.cem.de

IRELAND
CEM Technology (Ireland) Ltd
Sky Business Centre
9a Plato Business Park
Damastown
Dublin 15
Tel +353 (0)1 885 1752
Fax +353 (0)1 885 1601
Email: info.ireland@cem.com
www.cemmicrowave.co.uk

ITALY
CEM S.R.L.
Via Dell’Artigliano, 6/8
24693 Cologne al Serio (Bg)
Tel: (39) 35-896224
Fax: (39) 35-891661
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www.cemmicroonde.it

JAPAN
CEM Japan K.K.
2-18-10 Takana wa
Minato-ku, Tokyo
108-0074
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www.cemjapan.co.jp

UNITED KINGDOM
CEM Microwave Technology Ltd.
2 Middle Slade
Buckingham Industrial Estate
Buckingham MK18 1NA
Tel: (44) 1280-822873
Fax: (44) 1280-822342
e-mail: info.uk@cem.com
www.cemmicrowave.co.uk