



aappTec

# Focus XC



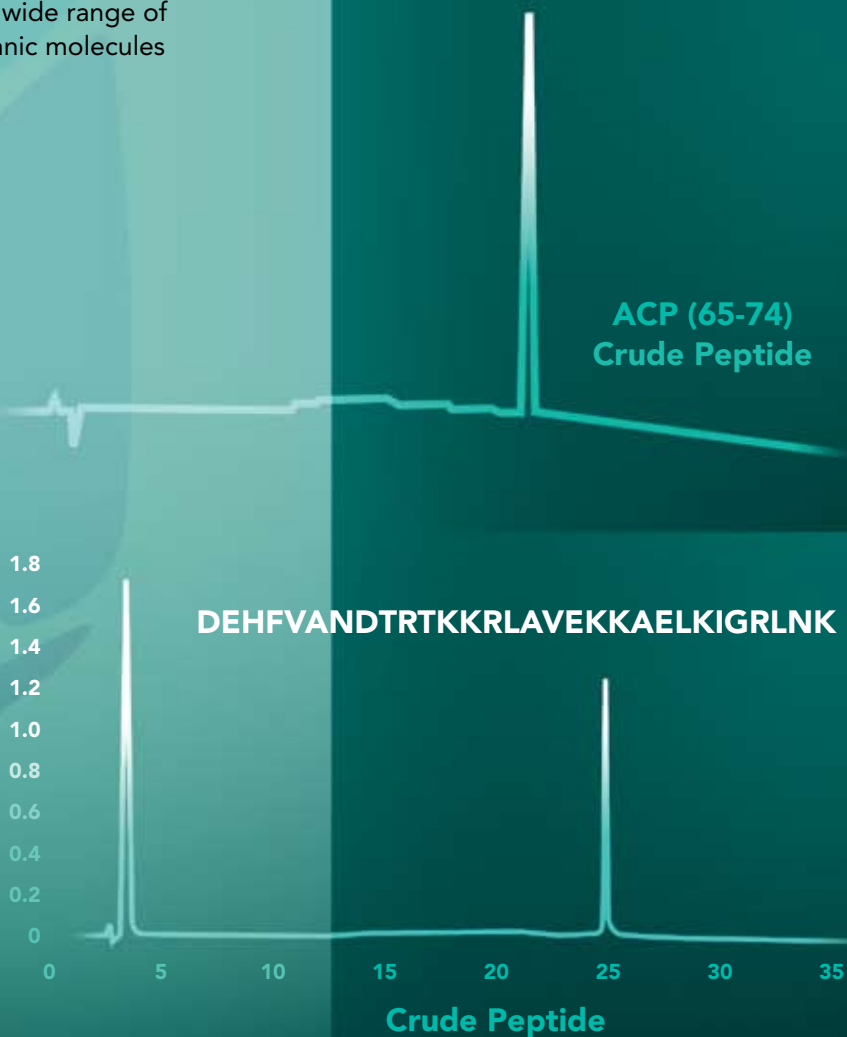
Ultimate Fully  
Automated Peptide  
Synthesizer with Sonication  
and Heating Options

## FOCUS XC – AUTOMATED PEPTIDE SYNTHESIZER

aarrtec's Focus XC is a compact, easy to use fully automated peptide synthesizer that will increase laboratory productivity. It can synthesize one, two, four or six peptides at a time for efficient high throughput synthesis. With 24 amino acid/reagent vessels, the Focus can be set up once and run all day or overnight without additional intervention. The Focus XC is compact and does not require a hood, yet it can prepare peptides in a scale range of 0.01 mM to 5.0 mM, making it a powerful peptide production tool. The Focus XC is an excellent choice for discovery research, synthetic methods and chemical process development, and research and production.

The Focus XC is easy to use with features both novice and experienced peptide chemists will appreciate. All reagent bottles, amino acid vials and reactors are visible and reagent levels can be quickly verified at a glance. The software has standard Boc and Fmoc protocols or users can develop new chemistries and customized protocols. Its simple command technology makes the Focus XC an excellent learning tool for beginners, but it still has the flexibility for a wide range of chemistry, including synthesis of peptides, organic molecules and DNA.

The Focus XC is based on the proven and reliable Endeavor 90 design, the most reliable synthesizer in the market. All liquids are transferred through stainless steel, TFE tubing or glass. The Focus XC provides documentation backup of all functions to the hard drive, with simultaneous printing capabilities. Calibration of delivery can also be confirmed to meet all regulations. The software and hardware allows for any type of chemistry, including Boc and Fmoc. In addition, the Focus XC is excellent for small scale peptide production phase I and phase II studies.



## SONICATION OPTION

Ultrasound has been shown to accelerate reactions to yield products not obtainable by purely thermal reactions.<sup>1</sup> Sonication disrupts aggregation and accelerates diffusion of reagents into the resin beads thus speeding up coupling reactions, particularly difficult couplings. aapptec offers an optional patent-pending (worldwide) sonication module for applying ultrasound to the reaction vessels.

## HEATING OPTION

Moderate heating during coupling has proven to be very beneficial in difficult couplings. Recently, conventional heating was shown to be as effective as microwaves in peptide synthesis.<sup>2</sup> The Focus XC has a heating option that allows the Reaction Vessel to be heated during reactions. Unlike microwave synthesizers that heat at each reaction, the Focus heating module applies heating only during the steps specified by the user thus eliminating unnecessary heating that can damage delicate products. Sonication with heating further accelerates peptide synthesis and produces purer crude peptides.

## VARIABLE SYNTHESIS SCALE

The Focus XC has interchangeable reactor sizes from 5 ml, 25 ml, 50 ml, 100 ml and 200 ml for synthesis scale of 0.01 mM to 5.0 mM. The reaction vessels are made of glass for ease of use, observation of the synthesis, and cost savings.

## TWO TO SIX SIMULTANEOUS SYNTHESIS

Two and up to six reactions can be conducted simultaneously using the same or completely different chemistries. For example, synthesis of a peptide via Fmoc chemistry and the Michael addition of a thiol to a polymer-bound enone can be conducted in separate reactors at the same time.

## SOLVENT/REAGENT BOTTLES

Optional configurations with up to eight bottles for solvents or stock reagent solutions are available on the Focus XC with a five bottle configuration standard.



### Transfers from AA to Single RV



### Transfers from AA to Multiple RVs



### Double Coupling from One AA



### Double Coupling to Two RVs



<sup>1</sup> Hickenboth CR, et al. *Nature*, **2007**, 446, 423-7.

<sup>2</sup> Bacsa B, Horváti K, Bősze S, Andrae F, Kappe CO J. *Org. Chem.* **2008**, 73, 7532-42.

## 24 AMINO ACID/REAGENT VIALS

The Focus XC has 24 amino acid vials with options for 36 or 48 vials. Each vial can be assigned to a single residue in the peptide sequence, which is useful when preparing large quantities of a single peptide, or the vials can be used as stock amino acid containers and accessed multiple times for multiple couplings in multiple peptides. The Focus XC software allows users to assign amino acids to the vials as needed for the synthesis. If a peptide requires a lot of one amino acid, it can be assigned more than one vial, allowing the Focus XC to complete an entire synthesis unattended without refilling.

The Focus XC can automatically on demand calculate, measure via the Measuring Vessel, and deliver to each amino acid vial the exact amount of solvent required to prepare a solution of specified concentration. The amino acid solution can either be preactivated within the amino acid vial or a portion of the stock solution can be transferred to the Measuring Vessel for preactivation. After preactivation, the solution is transferred to the Reaction Vessel for coupling to the resin. All liquids in the Focus XC are transferred under nitrogen pressure from any solvent or reagent container. This creates a completely inert atmosphere that is maintained by Nitrogen or Argon, and allows for chemistry that utilizes air or water sensitive reagents.

## MIXING

The Focus XC utilizes variable speed wrist action shaking, nitrogen bubbling or a combination of both for efficient, thorough mixing.

## EFFICIENT RESIN WASHING

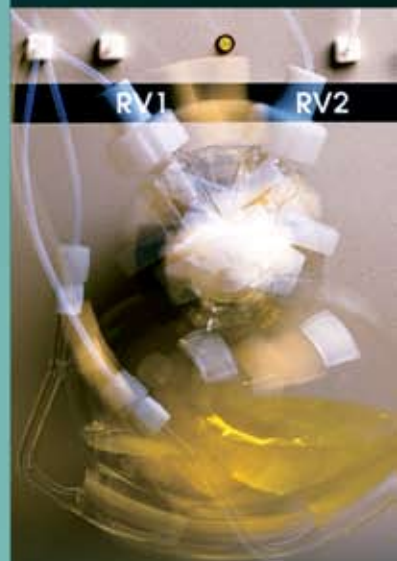
The fast wash command allows the resin to be washed from the top of the reactor through the resin to the waste. The fast wash also rinses resin from the sides of the reaction vessel and collects it on the frit. The wash command allows the user to add solvent from either the bottom or the top of the reactor for simple washing. Both wash commands provide efficient, uniform washing while keeping the resin intact at the bottom of the RV.

## RELIABILITY

The Focus XC is highly reliable, utilizing technology proven in the aapptec Endeavor 90. With simple preventive maintenance the Focus XC will provide reliable service for many years. If a valve should fail, it can easily be replaced by the user, eliminating emergency service calls or the need to return the instrument for repairs.

## SOPHISTICATED YET EASY-TO-USE SOFTWARE

The Focus XC's intuitive software and standard Boc and Fmoc protocols allow even inexperienced users to easily begin preparing high quality peptides with little training. On-screen instructions direct users through every step while point-and-click commands make operation simple. Experienced users can quickly create custom protocols including double couplings, special coupling reagents and protocols, and alternative deprotection chemistry. The software even allows users to cyclize peptides on resin, attach fluorescent labels, or modify peptides by attaching fatty acids, polyethylene glycol (PEG), or biotin labels.



## ON-INSTRUMENT CLEAVAGE

With on-instrument cleavage, the Focus XC extends the convenience, time savings and other productivity advantages of automation to the process of removing the product from the resin. The Focus XC can cleave products from resin using any of the common cleavage protocols except HF based cleavage protocols. Cleavage with TFA, TFMSA, TMSOTf or specialized cleavage reagents can be easily performed on the Focus XC without having to transfer the resin from the reaction vessel. All scavengers and additives utilized in common cleavage cocktails are compatible with the Focus XC. Just prepare the cleavage mixture and place it in one of the amino acid/reagent vials and the Focus XC can transfer it to the selected reaction vessel. The Focus XC will automatically agitate the mixture for a length of time specified by the user, then transfer the solution containing the cleaved product to another vessel.

The solution containing the cleaved product can be transferred by any one of three ways:

- It can be collected in a designated amino acid/reagent vial
- It can be transferred to another reaction vessel for further elaboration
- It can be sent to a flask or other container

Product cleavage on the Focus XC is easy and convenient and without the losses encountered in transferring product resin from a reaction vessel to a cleavage vessel. The Focus XC, with its flexibility, ease of use, multiple simultaneous synthesis capability, and convenient on-instrument cleavage, is a productivity enhancing tool suitable for any laboratory.

## TECHNICAL SUPPORT

All aapptec instruments are backed by our unparalleled expertise in solid phase, peptide and combinatorial chemistry. A qualified team of technical support and application specialists is dedicated to answering your questions related to instrument operation or specific chemistry applications.

## Three Ways to Transfer Cleavage Product Solution

### 1. Transfers from RV to AA



### 2. Transfers from RV to RV



### 3. Transfers from RV to Flask



## FEATURES

- Sophisticated capabilities at an affordable price
- Flexible enough for solid phase peptide, organic and combinatorial chemistry
- Applications in research process development and production
- Multiple simultaneous synthesis with wide variability in scale
- Intuitive software provides standard protocols plus the power to customize
- On-instrument cleavage of products
- Minimizes operating and maintenance costs
- Easy maintenance

## SPECIFICATIONS

**Width:** 27.5" (670 cm)

**Depth:** 15" (38.5cm)

**Height:** 32" (81cm) including reagent bottles

**Weight:** 85 lb (38.63 kilo)

**Fluid Transfer:** Nitrogen pressure, regulated to 10 psi (Pa 68947)

**Control:** The Focus XC is controlled by an external windows based PC. The CPU and associated hardware (mouse, keyboard, monitor, printer and standard communication including USB ports) are compatible with the control software.

- (1) HP (or comparable) Computer System with Windows® OS
- (1) LCD Monitor
- (1) Compatible printer
- Power Supply: UPS/SERVO/CVT

## STANDARD CONFIGURATION

- I – (2,4, or 6) 25ml RV
- II – (1-4) 200ml RV (5, 25, 50, 100, 200 available)
- Twenty-four 90 mL reactant vessels (Thirty-six and forty-eight optional)
- Interchangeable 105 ml and 15 ml Measuring/Calibration vessels
- Two 5L solvent/reagent bottle
- One 2L solvent/reagent bottle
- Two 1L solvent/reagent bottles
- Integrated deprotection/cleavage reagent system
- Two 20L waste containers with built-in overflow sensors
- Two caps with inserts for 20L waste containers
- Heating module (optional)
- Sonication module (optional)

## SCALE

One to six reactors: 0.01mM to 5.0 mM

## WARRANTY

One-year limited parts and labor



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