

**Quattro CCC™**

**QuikPrep™**

**TOTAL PREPARATIVE SOLUTIONS™ BY SEQUENTIAL CCC-HPLC.**



“Imagine separations based on high performance liquid-liquid chromatography (HPL-LC™) using ballistic mixing and settling at approximately 100,000 times per hour!”

The Quattro CCC™ Mk 5 QuikPrep™ offers unrivaled flexibility, dependability and safety.

- 7.5 mL to 750 mL Coil Options (<1 milligram to ~20+ grams, loading capacity options)
- Easily Upgradeable to 3000mL with PrepPlus™-LabPrep™ (up to ~120+ grams, and then up to multiple ton(s) per annum)
- Custom Coil Options: 4 Coils with any of the following id's 0.5, 0.8, 1.0, 1.6, 2.0, 2.2, 3.0 or 3.7 mm) (Note: Upgrading easily to PrepPlus-LabPrep allows for id's of 3.7, 6 or 12.5 mm) (Some id's are available in either PTFE or SS; see chart of rear for specifics)
- Consistent & Optimal Sun/Planet Radii for Maximum "G" Force Differential Throughout the Entire Modular Range Up to Ton per Annum Units
- Optimal Beta Values for Maximum "G" Force Differential
- Aircraft Adhesive Potted Coils for Extended Coil Life & Dependability
- Standard Safety Features: Locking Bar on Door with Rotation Interlock, Power Outage Lockdown, Heavy Duty Hinges, Substantial Casework Thickness, & Emergency Shutoff/Key Start
- Speed Options:  
Standard (0 to 860 rpm's) or Custom (0 to 2500 rpm's)
- Simplified HPL-LC Biphasic Generic Solvent System—the result of 10 years of research
- Air-flushed Rotor Chamber
- Optional Safety Sensors: Leak, Vibration or Bench Lockdown
- Additional Options: Temperature Control & Digital Readout, Speed Control & Digital Readout, Automated Control, Feasibility Study, Installation & Technology Training
- Electronics Isolated from Liquid Chamber
- Built & Certified to CE Standards



Build your personal QuikPrep™ by selecting from the coil sizes needed and any accessories required for your applications. Note: Each unit requires either two bobbins or one bobbin and a counter balance. Each bobbin can be wound with one or two coils. You have the option of designing a coil combination in either PTFE tubing and/or Stainless Steel based on your potential pressure needs, the volume of coils needed to meet your mass requirements and one or two coils per bobbin.

## Base Unit

Part #	Description
QP-0001	QuikPrep Mk 5 – includes chassis, yoke, platter, electronics and motor

## Accessories

QP-TC-DR	Temperature Control & Digital Readout	QP-FRS	Forward-Reverse Switch
QP-DSR	Speed Control and Digital Readout	QP-VALVE	Switching Valves
QP-AUTO	Automated Control	QP-SPARES	Replacement Leads & Bearings
QP-LS	Leak Sensor	QP-INSTALL	Installation
QP-VS	Vibration Sensor	QP-TRAIN	Training
QP-BL	Bench Lockdown	QP-FEAS	Feasibility Study

NOTE: Full systems inclusive of injector, pump, CCC, detector, fraction collector & data systems available.

## Coils & Counter-balance

QP-CB	Counter-balance
QPX-Y-T*	Single Coil of PTFE Tubing and flying leads
QPX-Y-S*	Single Coil of SS Tubing and flying leads

\*NOTE: Replace the X & Y in the above Part #'s with the appropriate Coil Volume (X) & Coil id (Y) from the chart below.

QP-2-1	Option of having two coils on one bobbin
QP-4-2	Option of having four coils on two bobbins

**Coil Selection Guide:** Select the coils based on your planned R&D or production needs. Any combination of coil size may be combined including four different sizes on two bobbins. Base your sizes on a volume loading of 5 to 15% or 0.5 to 4g per 100 mL of coil capacity. 1 gram per 100mL is the most typical mass loading for a Quattro CCC.

Tubing ID (mm)	Tubing Material	Minimum Coil Volume (mL)	~Mass Injection Loading per Coil (g)	Maximum Volume (Mass) (Same Coil ID) (mL) (g)	~Flow Rates (mL/min)
0.5	SS or PTFE**	7.5	0.04 to 0.3+	30 [up to 1.2+]	0.1 to 0.4+
0.8	SS or PTFE**	19	0.09 to 0.76+	76 [up to 3+]	0.2 to 1.2+
1.0	SS or PTFE**	30	0.15 to 1.2+	120 [up to 5+]	0.5 to 1.8+
1.6	PTFE	50	0.25 to 2+	200 [up to 8+]	2 to 4+
2.0	PTFE	100	0.5 to 4+	400 [up to 16+]	3 to 8+
2.16	SS	132	0.66 to 5.3+	528 [up to 21+]	4 to 12+
3.0	PTFE	170	0.85 to 6.8+	680 [up to 27+]	8 to 16+
3.7	SS	375	1.9 to 15+	750 [up to 30+]	12 to 21+

\*\*We recommend SS in these id's. Please request assistance for choice of hybrid coil combinations with different id's. Typical applications by coil id's: 0.5 to 1mm for CCC-MS, 1.6 to 3.7mm for lab preparations & 3.7 to 12.5mm for process preparations.

HPL-LC™ from



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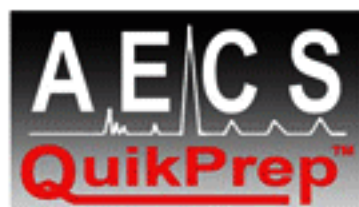
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[www.4chrom.com](http://www.4chrom.com)



**Quattro ccc™**

**LabPrep™**

## TOTAL PREPARATIVE SOLUTIONS™ BY SEQUENTIAL CCC-HPLC.



“Imagine separations based on high performance liquid-liquid chromatography (HPL-LC™) using ballistic mixing and settling at approximately 100,000 times per hour!”

The Quattro CCC™ Mk 5 LabPrep™ offers unrivaled flexibility, dependability and safety.

- 50mL to 1706mL Coil Options (<1milligram to ~20+ grams, loading capacity options)
- Easily Upgradeable to 3000mL with PrepPlus™-LabPrep (up to ~120+ grams, and then up to multiple ton(s) per annum)
- Custom Coil Options: 4 Coils with any of the following id's 1.0, 1.6, 2.0, 2.2, 3.0, 3.7 or 6.0 mm)  
(Note: Upgrading easily to PrepPlus-LabPrep allows for id's of 3.7, 6 or 12.5 mm) (Some id's are available in either PTFE or SS; see chart of rear for specifics)
- Consistent & Optimal Sun/Planet Radii for Maximum "G" Force Differential Throughout the Entire Modular Range Up to Ton per Annum Units
- Optimal Beta Values for Maximum "G" Force Differential
- Aircraft Adhesive Potted Coils for Extended Coil Life & Dependability
- Standard Safety Features: Locking Bar on Door with Rotation Interlock, Power Outage Lockdown, Heavy Duty Hinges, Substantial Casework Thickness, & Emergency Shutoff/Key Start
- Speed Options:  
Standard (0 to 860rpm's) or  
Custom (0 to 2500 rpm's)
- Simplified HPL-LC Biphasic Generic Solvent System—the result of 10 years of research
- Air-flushed Rotor Chamber
- Optional Safety Sensors: Leak, Vibration or Bench Lockdown
- Additional Options: Temperature Control & Digital Readout, Speed Control & Digital Readout, Automated Control, Feasibility Study, Installation & Technology Training
- Electronics Isolated from Liquid Chamber
- Built & Certified to CE Standards



Build your personal LabPrep™ by selecting from the coil sizes needed and any accessories required for your applications. Note: Each unit requires either two bobbins or one bobbin and a counter balance. Each bobbin can be wound with one or two coils. You have the option of designing a coil combination in either PTFE tubing and/or Stainless Steel based on your potential pressure needs, the volume of coils needed to meet your mass requirements and one or two coils per bobbin.

## Base Unit

Part #	Description
LP-0001	LabPrep Mk 5 – includes chassis, yoke, platter, electronics and motor

## Accessories

LP-TC-DR	Temperature Control & Digital Readout	LP-FRS	Forward-Reverse Switch
LP-DSR	Speed Control and Digital Readout	LP-VALVE	Switching Valves
LP-AUTO	Automated Control	LP-SPARES	Replacement Leads & Bearings
LP-LS	Leak Sensor	LP-INSTALL	Installation
LP-VS	Vibration Sensor	LP-TRAIN	Training
LP-BL	Bench Lockdown	LP-FEAS	Feasibility Study

**NOTE:** Full systems inclusive of injector, pump, CCC, detector, fraction collector & data systems available.

## Coils & Counter-balance

LP-CB	Counter-balance
LPX-Y-T*	Single Coil of PTFE Tubing and flying leads
LPX-Y-S*	Single Coil of SS Tubing and flying leads

**\*NOTE:** Replace the X & Y in the above Part #'s with the appropriate Coil Volume (X) & Coil id (Y) from the chart below.

LP-2-1	Option of having two coils on one bobbin
LP-4-2	Option of having four coils on two bobbins

**Coil Selection Guide:** Select the coils based on your planned R&D or production needs. Any combination of coil size may be combined including four different sizes on two bobbins. Base your sizes on a volume loading of 5 to 15% or 0.5 to 4g per 100mL of coil capacity. 1 gram per 100mL is the most typical mass loading for a Quattro CCC.

Tubing ID (mm)	Tubing Material	Minimum Coil Volume (mL)	~Mass Injection Loading per Coil (g)	Maximum Volume (Mass) (Same Coil ID) (mL) (g)	~Flow Rates (mL/min)
1.0	SS or PTFE**	30	0.15 to 1.2+	240 [up to 9.6+]	0.5 to 1.8+
1.6	PTFE	50	0.25 to 2+	400 [up to 16+]	2 to 4+
2.0	PTFE	100	0.5 to 4+	800 [up to 32+]	3 to 8+
2.16	SS	132	0.66 to 5.3+	1000 [up to 40+]	4 to 12+
3.0	PTFE	170	0.85 to 6.8+	1200 [up to 48+]	8 to 16+
3.7	SS	375	1.9 to 15+	1600 [up to 60+]	12 to 21+
6.0	SS	853	4.3 to 34+	1706 [up to 64+]	28 to 56+

\*\*We recommend SS in these id's. Please request assistance for choice of hybrid coil combinations with different id's. Typical applications by coil id's: 0.5 to 1mm for CCC-MS, 1.6 to 3.7mm for lab preparations & 3.7 to 12.5mm for process preparations.

HPL-LC™ from



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[www.4chrom.com](http://www.4chrom.com)



# Quattro CCC™ PrepPlus™-LabPrep™

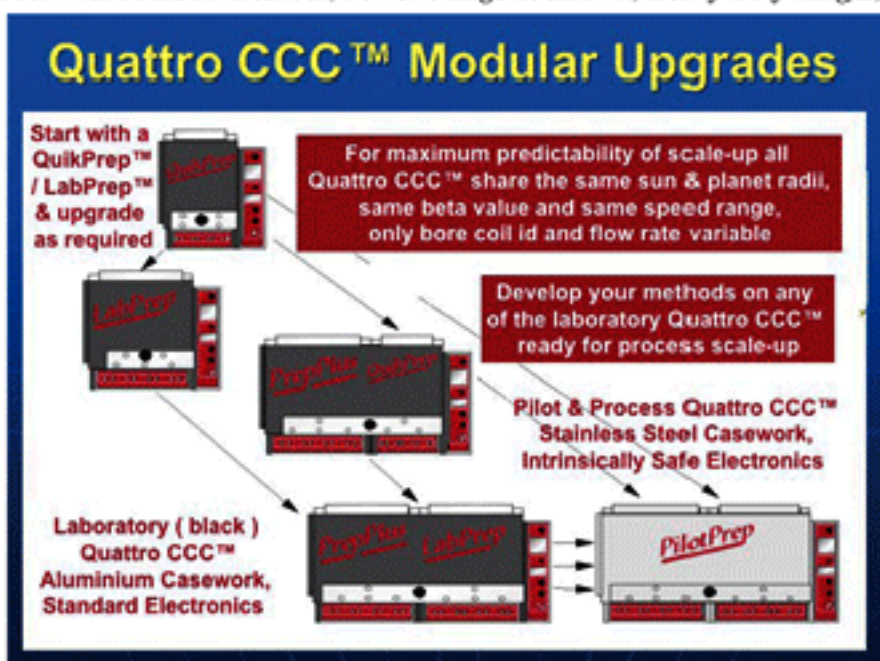
**TOTAL PREPARATIVE SOLUTIONS™ BY SEQUENTIAL CCC-HPLC.**



“Imagine separations based on high performance liquid-liquid chromatography (HPL-LC™) using ballistic mixing and settling at approximately 100,000 times per hour!”

The Quattro CCC™ Mk 5 PrepPlus-LabPrep offers unrivaled flexibility, dependability and safety.

- 2000mL to 3000mL Coil Options (90grams to ~120+ grams, loading capacity options)
- Custom Coil Options: 4 Coils with any of the following id's 2.2, 3.7, 6.0 or 12.5 mm (Some id's are available in either PTFE or SS; see chart of rear for specifics)
- Consistent & Optimal Sun/Planet Radii for Maximum "G" Force Differential Throughout the Entire Modular Range Up to Ton per Annum Units
- Optimal Beta Values for Maximum "G" Force Differential
- Aircraft Adhesive Potted Coils for Extended Coil Life & Dependability
- Standard Safety Features: Locking Bar on Door with Rotation Interlock, Power Outage Lockdown, Heavy Duty Hinges, Substantial Casework Thickness, & Emergency Shutoff/Key Start
- Speed Options: Standard (0 to 860 rpm's) or Custom (0 to 2500 rpm's)
- Simplified HPL-LC Biphasic Generic Solvent System—the result of 10 years of research
- Air-flushed Rotor Chamber
- Optional Safety Sensors: Leak, Vibration or Bench Lockdown
- Additional Options: Temperature Control & Digital Readout, Speed Control & Digital Readout, Automated Control, Feasibility Study, Installation & Technology Training
- Electronics Isolated from Liquid Chamber
- Built & Certified to CE Standards



Build your personal PrepPlus™-LabPrep™ by selecting from the coil sizes needed and any accessories required for your applications.

Note: Each unit requires either two bobbins or one bobbin and a counter balance. Each bobbin can be wound with one or two coils. You have the option of designing a coil combination in either PTFE tubing and/or Stainless Steel based on your potential pressure needs, the volume of coils needed to meet your mass requirements and one or two coils per bobbin.

## Base Unit

Part #	Description
PPLP-0001	PrepPlus-LabPrep Mk 5 – includes chassis, yoke, platter, electronics and motor

## Accessories

PPLP-TC-DR	Temperature Control & Digital Readout	PPLP-FRS	Forward-Reverse Switch
PPLP-DSR	Speed Control and Digital Readout	PPLP-VALVE	Switching Valves
PPLP-AUTO	Automated Control	PPLP-SPARES	Replacement Leads & Bearings
PPLP-LS	Leak Sensor	PPLP-INSTALL	Installation
PPLP-VS	Vibration Sensor	PPLP-TRAIN	Training
PPLP-BL	Bench Lockdown	PPLP-FEAS	Feasibility Study

NOTE: Full systems inclusive of injector, pump, CCC, detector, fraction collector & data systems available.

## Coils & Counter-balance

PPLP-CB	Counter-balance
PPLPX-Y-T*	Single Coil of PTFE Tubing and flying leads
PPLPX-Y-S*	Single Coil of SS Tubing and flying leads

\*NOTE: Replace the X & Y in the above Part #'s with the appropriate Coil Volume (X) & Coil id (Y) from the chart below.

PPLP-2-1	Option of having two coils on one bobbin
PPLP-4-2	Option of having four coils on two bobbins

**Coil Selection Guide:** Select the coils based on your planned R&D or production needs. Any combination of coil size may be combined including four different sizes on two bobbins. Base your sizes on a volume loading of 5 to 15% or 0.5 to 4g per 100 mL of coil capacity. 1 gram per 100 mL is the most typical mass loading for a Quattro CCC.

Tubing ID (mm)	Tubing Material	Minimum Coil Volume (mL)	~Mass Injection Loading per Coil (g)	Maximum Volume (Mass) (Same Coil ID) (mL) (g)	~Flow Rates (mL/min)
2.2	SS	132	0.66 to 5.3+	2000 [up to 90+]	4 to 12+
3.7	SS	375	1.9 to 15+	3000 [up to 120+]	12 to 21+
6.0	SS	853	4.3 to 34+	3000 [up to 120+]	28 to 56+
12.5	SS	3000	15 to 120+	3000 [up to 120+]	131 to 263+

\*\*We recommend SS in these id's. Please request assistance for choice of hybrid coil combinations with different id's. Typical applications by coil id's: 0.5 to 1mm for CCC-MS, 1.6 to 3.7mm for lab preparations & 3.7 to 12.5mm for process preparations.

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[www.4chrom.com](http://www.4chrom.com)



# Quattro ccc™ PilotPrep™ & ProcessPrep™

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“Imagine separations based on high performance liquid-liquid chromatography (HPL-LC™) using ballistic mixing and settling at approximately 100,000 times per hour!”

The Quattro CCC™ Mk5 PilotPrep and ProcessPrep offers unrivaled flexibility, dependability and safety.

- From 2000mL to any upper limit Coil Options (90grams to Multiple Tons per Annum, loading capacity options)
- Custom Coil Options: 4 Coils with any of the following id's 2.2, 3.7, 6.0 or 12.5 mm (Some id's are available in either PTFE or SS; see chart of rear for specifics)
- Consistent & Optimal Sun/Planet Radii for Maximum "G" Force Differential Throughout the Entire Modular Range Up to Ton per Annum Units
- Optimal Beta Values for Maximum "G" Force Differential
- Aircraft Adhesive Potted Coils for Extended Coil Life & Dependability
- Standard Safety Features: PilotPrep - Locking Bar on Door with Rotation Interlock, Power Outage Lockdown, Heavy Duty Hinges, Substantial Casework Thickness, & Emergency Shutoff/Key Start; ProcessPrep - Your Option to have Rotors Cased or Uncased for Use in Your Non-intrinsically or Intrinsically Safe Room Respectively
- Speed Options: Standard (0 to 860 rpm's) or Custom (0 to 1500 rpm's)
- Simplified HPL-LC Biphasic Generic Solvent System—the result of 10 years of research
- Air-flushed Rotor Chamber
- Optional Safety Sensors: Leak, Vibration or Bench Lockdown
- Additional Options: Temperature Control & Digital Readout, Speed Control & Digital Readout, Automated Control, Feasibility Study, Installation & Technology Training
- Electronics Isolated from Liquid Chamber
- Built & Certified to CE Standards

## Quattro CCC™ Modular Upgrades

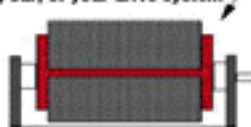
### Quattro CCC™

*"the upgradeable package, matched to your developing needs, and to your budget"*

**1. QuikPrep:**  
7.5 to 750 mL

**2. PrepPlus-LabPrep:**  
30 to 3000 mL

**3. ProcessPrep:**  
Any volume you want, cased or uncased, rotors in series or parallel, using our, or your drive system



Coils in PTFE or stainless steel

Speeds up to 2500rpm

Machines in aluminium or stainless steel

All machines can be upgraded, or downgraded, to any size you want

Machines easily customised for specific needs

**We will custom design your Quattro CCC™ for your needs**

## Quattro CCC™ Modular Upgrades

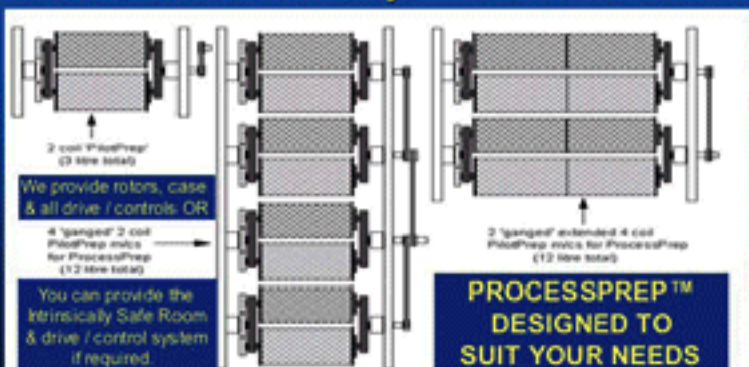


Any number of coils can be provided for parallel or series use, with the limitation of 4 to 6 per rotor, on a multi-rotor unit

Each unit requires either two bobbins or one bobbin and a counter balance. Each bobbin can be wound with one or two coils. You have the option of designing a coil combination in either PTFE tubing and/or Stainless Steel based on your potential pressure needs, the volume of coils needed to meet your mass requirements and one or two coils per bobbin.

Contact us to build your personal PilotPrep™ or ProcessPrep™ by selecting from the coil sizes needed and any accessories required for your applications.

## Quattro CCC™ Ganged Coils For ProcessPrep™ Production



No maximum volume for ProcessPrep™, modules of 3 / 6 / 12 / 24 / 48 + litres can be ganged together for parallel or series use

HPL-LC™ from



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[www.4chrom.com](http://www.4chrom.com)

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Click [www.quattroprep.com](http://www.quattroprep.com) for more information

## **Modular Cases in Stainless Steel or Aluminum**

Modular containment cases can be manufactured in stainless steel for intrinsically safe environment usage or aluminum for non-intrinsically safe environment usage and can be custom made to suit your requirements.

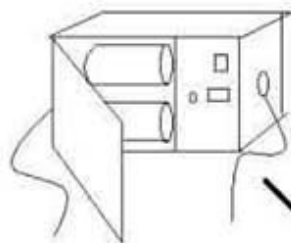


## Evolution of Quattro CCC™ products

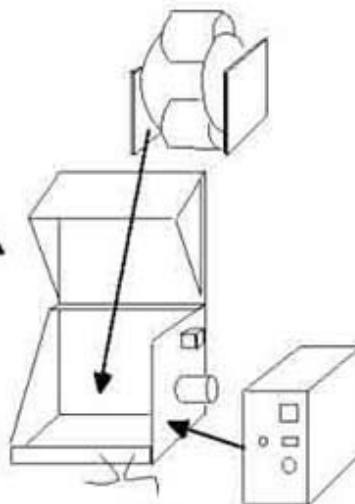
The first, second and third series of Quattro CCC™ were all unit designs. The Modular Mk 4 was designed specifically to allow linear scale up from milligram to tonne plus per annum production .....with no change in the chromatographic conditions once they had been optimized at the laboratory scale.

### Mono chassis of Quattro Mk 2 & Mk 3

If single or multiple bare rotor assembly(ies) with all metal parts in **STAINLESS STEEL** then this is a **PROCESSPREP**.



If full instrument with some aluminium in construction: - then a **LABPREP**, if all **STAINLESS STEEL** metal construction then **PILOTPREP**.



### New modular design of Quattro Mk 4

## Evolution of Quattro CCC™ products

The first Quattro CCC™ was designed in 1995 with the first model sold to Smith Kline Beecham in the UK.



## **Evolution of Quattro CCC™ products**

The onset of changing legislative requirements with the European Community caused the revision of the Mk 1 onto the Mk 2 and subsequently the Mk 3.

A full realization of the enormous implications for cost savings in process chromatography and process extraction caused the total subsequent revision of the design to Mk 4 Modular Series.

