

LC Systems

# Prominence-i Specifications

 **-Series Plus**



# Specifications

		Prominence-i		
Model		LC-2030 ( UV model without sample cooler )	LC-2030C ( UV model )	LC-2030C 3D ( PDA model )
P/N		228-65800-48	228-65801-48	228-65802-48
Pump	Degassing unit	Five Lines: Mobile phase 4 + Rinse solution 1 (Volume 400 μL)		
	Pumping method	Parallel-type double plunger		
	Pulsation	≤ 0.1 MPa (1.0 mL/min,10 MPa, Water)		
	Flow rate setting range	0.0001 to 10 mL/min		
	Flow rate accuracy	≤ ±1% or ≤ ±2 μL/min, below whichever is greater (0.01 to 2 mL/min, Specified condition) ≤ ±2% (2 to 5 mL/min, Specified condition)		
	Flow rate precision	< 0.06 %RSD or < 0.02 minSD, below whichever is greater		
	Configuration	Four-solvent low-pressure gradient		
	Gradient / range of set concentrations	0 to 100%, in 0.1% steps		
	Gradient / concentration accuracy	±0.5% (0.1 to 2 mL/min, 1 to 20 MPa, Specified condition)		
	Gradient / concentration precision	±0.1% (1 mL/min,10 MPa, Specified condition)		
	Maximum pressure	44 MPa (0.0001 to 5 mL/min), 22 MPa (5.0001 to 10 mL/min)		
	System Delay Volume	1100 μL (Option: 650 μL, 460 μL)		
Autosampler	Injection method	Total-volume sample injection		
	Injection volume accuracy	±1% (50 μL, N = 10)		
	Injection volume setting range	0.1 to 100 μL (Option: 0.1 to 50 μL, 1 to 500 μL, 1 to 2,000 μL)		
	Injection volume reproducibility	RSD < 0.20% (5.0–2000 μL), RSD < 0.25% (2.0–4.9 μL), RSD < 0.5% (1.0–1.9 μL), RSD < 1.0% (0.5–0.9 μL)		
	Cross-contamination	0.0025% (Caffeine, Specified condition)		
	Injection cycle time	Min. 14 sec (Specified condition)		
	Samples for processing	336 (1 mL), 216 (1.5 mL), 112 (4 mL), 4 (MTP/DWP)		
	Sample cooler	Not included	4 to 45°C (Room temperature needs to be 30°C or lower and the humidity 70% or less to go down to 4°C. Room temperature needs to be 15°C or higher to go up to 45°C.)	
	Injection linearity	> 0.9999 (1 to 100 μL, Specified condition)		
	Pretreatment function	Auto-dilution, Reagent addition, Co-injection		
Column Oven	Heating and cooling method	Forced air circulation method		
	Containable column size	6 pieces at 10 cm max., 3 pieces at 10 cm to 30 cm		
	Temperature control range	Room temperature – 12 to 90°C, Setting range 4 to 90°C		
	Temperature control precision	±0.1°C		
	Temperature stability	±0.8°C (Specified condition)		
	Flow rate switching valve	Max. 1 pc		

Prominence-i		
Model	LC-2030 (UV model without sample cooler)	
P/N	228-65800-48	
UV Detector	Wavelength range	
	190 to 700 nm	
	Spectrum slit width	
	8 nm	
	Wavelength accuracy	
	≤ ±1 nm	
	Wavelength reproducibility	
	≤ ±0.1 nm	
	Noise level	
	≤ ±2.5 × 10 <sup>-6</sup> AU, (250 nm, Specified condition)	
	Drift	
	≤ 100 × 10 <sup>-6</sup> AU/h (250 nm, Specified condition)	
PDA Detector	Simultaneous monitoring of 2 wavelengths	
	Enable (Any 2 wavelengths of 190 to 370 nm or 371 to 700 nm)	
	Linearity	
	Up to 2.5 AU (5%)	
	Sampling rate	
	Up to 100 Hz	
	Light source	
Miscellaneous	Deuterium (D2) lamp	
	Flow cell	
	12 µL (10 mm, TC), 12 MPa	
Option cell	High-Speed: 8 µL (10 mm, TC),	
	Semi-micro: 2.5 µL (5mm, TC)	

Prominence-i		
Model	LC-2030C 3D (PDA model)	
P/N	228-65802-48	
PDA Detector	Wavelength range	
	190 to 800 nm	
	Spectral resolution	
	1.4 nm (Specified condition)	
	Slit width	
	1.2 nm, 8 nm	
	Device resolution	
	0.6 nm/pixel	
	Number of photodiode array elements	
	1024	
	Wavelength accuracy	
	≤ ±1 nm	
Miscellaneous	Noise level	
	≤ ±3 × 10 <sup>-6</sup> AU (250 nm, reference: 350 nm, Specified condition)	
	Drift	
	≤ 500 × 10 <sup>-6</sup> AU/h (250 nm, reference: 350 nm, Specified condition)	
	Linearity	
	Up to 2 AU (5%)	
	Sampling rate	
Option cell	Up to 100 Hz	
	Light source	
	Deuterium (D2) lamp (Standard), tungsten (W) lamp (option)	
	Flow cell	
Option cell	10 µL (10mm, TC) 12 MPa	
	High-Speed: 8 µL (10 mm, TC),	
Option cell	Semi-micro: 2.5 µL (5 mm, TC)	

Prominence-i			
Model	LC-2030 ( UV model without sample cooler )	LC-2030C ( UV model )	LC-2030C 3D ( PDA model )
P/N	228-65800-48	228-65801-48	228-65802-48
Miscellaneous	Dimensions		
	W410×H605×D500 mm		
	Weight		63 kg
	58 kg		
	Available pH range		
Option cell	1 to 13		
	Materials for parts in contact with liquids		
	Stainless steel (SUS316L, SUS316), FEP, PEEK, PTFE, perfluoroelastomer, ruby, sapphire, Hastelloy C, GFP, ceramic, PFA, quartz, PPS		
Workstation	LabSolutions LC/GC Ver.5.71 or later, LabSolutions DB/CS Ver.6.31 or later (Incompatible with LCsolution)		

## Main Optional Accessories

### Solvent Delivery Units

Part Name	P/N	Description
FCV-11AL	228-45048-58	This is the mobile phase selection valve (3 flow lines). An FCV-11AL connection kit is required to connect to an FCV-11AL unit.
FCV-11ALS	228-45049-91	This is the mobile phase selection valve (1 flow line). An FCV-11AL connection kit is required to connect to an FCV-11AL unit.
FCV-11AL Connection Kit	228-56249-41	This kit includes connector cables and other items necessary for connecting FCV-11AL and FCV-11ALS units.
780 µL Mixer Kit	228-57313-41	This parts set includes a mixer and tubing for using TFA or other UV-absorbing substance as a mobile phase.
2 mL Mixer Kit	228-57313-42	This parts set includes a mixer and tubing for using TFA or other UV-absorbing substance as a mobile phase.
Compatible Volume System Kit	228-57796-41	This kit decreases the system volume to 650 µL.
Low Volume System Kit	228-57796-42	This kit decreases the system volume to 460 µL.

### Autosamplers

Part Name	P/N	Description
100 µL Sample Loop	228-56074-42	This sample loop is used for injecting 100 µL volumes. (Standard configuration parts of Prominence-i)
Optional 500 µL Sample Loop	228-45405-41	This increases the injection volume to 500 µL.
Optional 2 mL Sample Loop	228-45405-42	This increases the injection volume to 2 mL.
UHPLC Fitting (set of 1)	228-56867-41	Fitting for inlet to high-pressure capacity column
UHPLC Fitting (set of 10)	228-56867-43	Fitting for inlet to high-pressure capacity column
Sample Rack	228-55735-41	Additional sample rack
Plate for 1 mL Sample Vials (set of 2)	228-56197-41	Plate used to place 84 1 mL sample vials
Plate for 1.5 mL Sample Vials (set of 2)	228-50830-92	Plate used to place 54 1.5 mL sample vials
Plate for 4 mL Sample Vials (set of 2)	228-56197-42	Plate used to place 28 4 mL sample vials
Metal plate for 1.5ml Sample Vials (set of 1)	228-61515-42	Plate used to place 54 1.5 mL sample vials

### Column Ovens

Part Name	P/N	Description
Column Clamp ASSY B5	228-15617-91	This set of clamps is for adding a column with an outside diameter between 6.4 and 9.5 mm.
Column Clamp ASSY B8	228-15617-92	This set of clamps is for adding a column with an outside diameter between 9.5 and 12.7 mm.
FCV-14AH	228-45014-41	Automatic column switching valve with 6 positions and 7 ports which is usable at a pressure of 34.3 MPa max.
FCV-34AH	228-45185-41	Automatic column switching valve with 6 positions and 7 ports which is usable at a pressure of 100 MPa max.
FCV Mounting Kit	228-55765-42	This parts kit is used to secure an FCV-14AH/ 34AH unit inside the column oven.
CMD	228-37281-41	This column management device is used to record information about columns.
CMD Cable	228-39991	This cable is used to connect between the CMD and main units.

### UV Detectors

Part Name	P/N	Description
Recycle Valve	228-56808-41	This low-pressure flow-line selection valve is used to recycle mobile phase.
Flow Cell for UV Detectors	228-56167-41	This cell is compatible with conventional analysis. (Standard configuration parts of Prominence-i)
Semi-Micro Cell for UV Detectors	228-45605-46	This cell is compatible with semi-micro analysis.

### PDA Detectors

Part Name	P/N	Description
W Lamp ASSY for PDA Detectors	228-57110-41	This assembly includes a tungsten lamp and its socket used for high-sensitivity analysis in the long-wavelength region.
Flow Cell for PDA Detectors	228-42593-43	This cell is compatible with conventional analysis. (Standard configuration parts of Prominence-i)
High-Speed Cell for PDA Detectors	228-45618-54	This cell is compatible with fast analysis. (Standard configuration parts of Nexera-i)
Semi-Micro Cell for PDA Detectors	228-45605-47	This cell is compatible with semi-micro analysis.

## Other Options

Part Name	P/N	Description
Earthquake Reinforcement Kit	228-56298-41	This kit is used to reinforce how the reservoir tray is attached.
1 L Mobile Phase Bottles (set of 5)	228-38583-42	This is a set of five one-liter reservoir bottles for holding mobile phases.
Optional Detector Attachment Kit	228-56245-41	This kit contains a top plate and reservoir tray for installing an additional detector.
Optional Optical Board	228-55518-41	This board is used to install additional connectors for optical link cables. It is used to install fluorescence detector RF-20A series and other detectors.
Camera ASSY for Autosampler	228-55517-41	This camera is installed inside autosamplers. It allows you to monitor the needle action via the computer screen.
Optional AD Board	228-55519-41	This is an analog-digital converter board. It is used to input the detector signal as an analog signal, such as when a non-Shimadzu detector is connected.
Touch Panel Protecting Sheet	228-59212-41	Protecting sheet for touch panel.
Upgrade Kit UV	228-66139-43	Kit for upgrade from Prominence-i (UV model with sample cooler) to Nexera-i Plus.
Upgrade Kit PDA	228-66139-44	Kit for upgrade from Prominence-i (PDA model) to Nexera-i Plus.
Smart Automation Kit (4-mobile phase)	228-26004-44	This kit includes FCV-14AH for up to six columns switching and other parts.
Smart Automation Kit (7-mobile phase)	228-26004-43	This kit includes FCV-14AH for up to six columns switching, FCV-11AL for solvent delivery of seven mobile phases and other parts.

## Optional Detector Specifications



### RID-20A

	RID-20A (228-45104-XX)
Reflective index measurement range	1 to 1.75 RIU
Noise level	≤ 2.5 nRIU
Drift	≤ 0.1 μRIU/h
Range	A mode: 0.01 to 500 μRIU P and L modes: 1 to 5000 μRIU
Response	No filtering, 0.05 to 10 sec, 11 steps
Polarity switching	With a switch
Zero adjustment	Auto zero, auto optical zero, baseline shift functions
Maximum operating flow rate	20 mL/min (150 mL/min with an option)
Temperature control of cell unit	30 to 60°C (0.01°C steps)
Cell capacity	9 μL
Material in contact with liquid	SUS316L, quartz, PTFE, Al <sub>2</sub> O <sub>3</sub> , ETFE
Maximum operating pressure	0.4 MPa (4 kgf/cm <sup>2</sup> )
Operating temperature range	4 to 35°C
Dimensions and weight	W260 × D420 × H140 mm, 12 kg

Note: Hexafluoroisopropanol (HFIP) cannot be used as the mobile phase.



### RF-20A/RF-20Axs

	RF-20A (228-45147-XX)	RF-20Axs (228-45148-XX)
Light source	Xenon lamp	Xenon lamp, low-pressure mercury lamp (To check wavelength accuracy)
Wavelength range	0, 200 to 650 nm	0, 200 to 750 nm
Spectral bandwidth	20 nm	
Wavelength accuracy	±2 nm	
Wavelength precision	±0.2 nm	
S/N	Water Raman peak S/N 1200 min. Low background S/N > 9000	Water Raman peak S/N 2000 min. Low background S/N > 12000
Cell capacity	12 μL, 2 MPa (approx. 20 kgf/cm <sup>2</sup> ), SUS316L, PTFE (fluororesin), quartz	
Cell temperature control range	—	4 to 40°C, 1°C steps
Cell temperature setting range	—	(Room temperature – 10°C) to 40°C
Functions	Four-wavelength detection, wavelength scanning	
Safety measures	Liquid-leakage sensor	
Operating temperature range	4 to 35°C	
Dimensions and weight	W260 × D420 × H210 mm, 16 kg	W260 × D420 × H210 mm, 18 kg



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