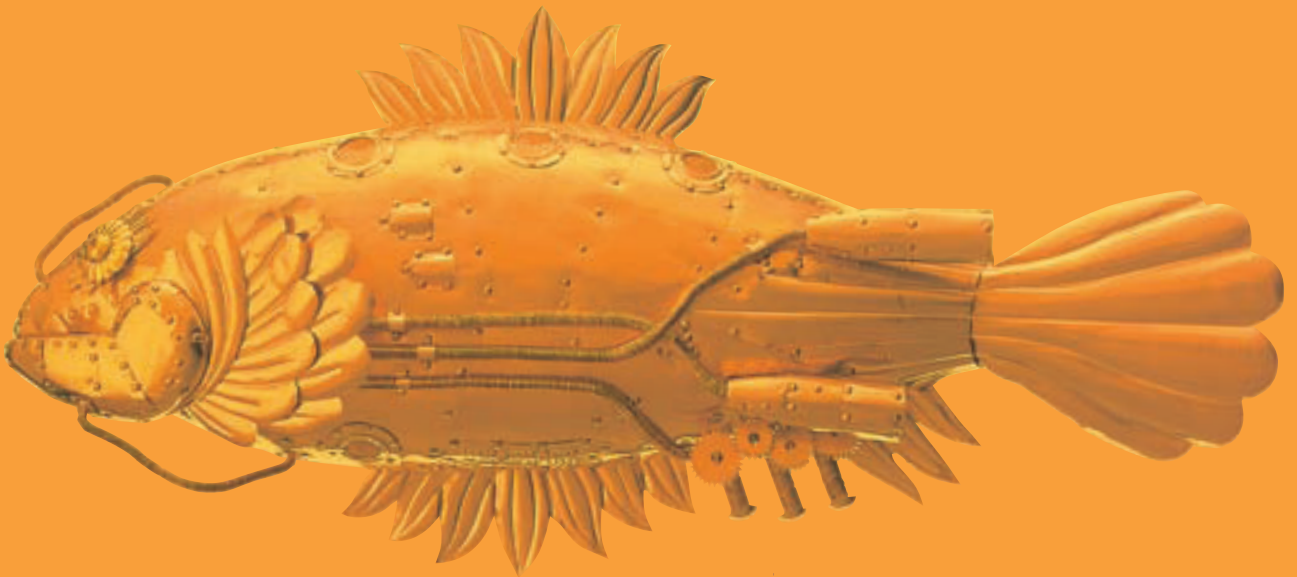


Shodex™ Detectors



Capture the Essence

Refractive Index Detector

Shodex RI-101, 102, 104

The Shodex RI-100 series is a versatile and high sensitive RI detectors that can be used with various manufactures' HPLC systems. It consists of a color-LCD, an automatic start-up function, and a validation wizard.

〈Features〉

- Equipped with a color liquid crystal display, the detector monitors analytical status in real time.
- The automatic start-up function controls the complicated operations such as blank substitution and baseline stabilization automatically.
- The validation wizard enables easy component validation.
- Improved temperature control system shortens the required warm-up time and provides stable background.
- The leak sensor automatically stops the pump in case of solvent leakage.
- External input and output terminals and RS232C communication ports can be used to connect various HPLC systems for an advanced automation.
- Usable in UHPLC systems



Product Code	F4010101	F4010104	F4010102
Model	RI-101	RI-104	RI-102
	Analysis	Semi-micro	Preparative
Flow cell type	2 chamber-type		
Measuring method	Deflection type		
Refractive Index range	1.00~1.75		
Measurement range	0.25~512 μ RIU	0.25~512 μ RIU	2.5~5120 μ RIU
Drift *	0.2 μ RIU/h	0.2 μ RIU/h	2 μ RIU/h
Linearity range	\geq 600 μ RIU	\geq 600 μ RIU	\geq 6000 μ RIU
Noise **	\leq 2.5nRIU	\leq 5nRIU	\leq 25nRIU
Response	0.1, 0.25, 0.5, 1, 1.5, 2, 3, 6sec		
Auto zero	Full auto zero		
Auto zero range	All range		
Off-set range	0~500mV (Same as integrator output)		
Off-set resolution	10mV (Same as integrator output)		
Integrator output (Sensitivity)	DC 0~1V (2mV/ μ RIU, 8mV/ μ RIU)	DC 0~1V (2mV/ μ RIU, 8mV/ μ RIU)	DC 0~1V (0.2mV/ μ RIU, 0.8mV/ μ RIU)
Cell volume	8 μ L	2.5 μ L	8 μ L
Flow rate	(Usual)	0.2~3.0mL/min	0.2~1.0mL/min
	(Max.)	10mL/min (solvent ; pure water)	1.0mL/min (solvent ; pure water)
Maximum back pressure	50kPa		
Internal volume	IN \rightarrow Cell : ca. 60 μ L Cell \rightarrow OUT : ca. 600 μ L All (Cell \rightarrow OUT) : ca. 670 μ L	IN \rightarrow Cell : ca. 10 μ L Cell \rightarrow OUT : ca. 355 μ L All (Cell \rightarrow OUT) : ca. 370 μ L	IN \rightarrow Cell : ca. 120 μ L Cell \rightarrow OUT : ca. 510 μ L All (Cell \rightarrow OUT) : ca. 640 μ L
Recorder output	0~10mV/FS		
External input	Purge On/Off, Auto Zero, Marker		
External output	① READY (Automatic start-up) ② LEAK ③ ERROR (OVER HEAT/LOW LIGHT INTENSITY/NULL GLASS HOME POSITION/LOST PARAMETERS/OPTICAL BALANCE) (Contact capacity : DC24V 0.1A max.)		
Temperature control	OFF, 30~55 $^{\circ}$ C (1 $^{\circ}$ C step), 77 $^{\circ}$ C Temp. fuse		
Communication port	RS232C		
Operational support functions	① Automatic start-up (Start Up Sequence) ② Span/Validation Guide ③ Real Time Baseline Monitor		
Wetted materials	Stainless steel 316, Teflon, Quartz glass		
Power source, Power consumption	AC100~240 \pm 10%, 50/60Hz, 150VA max		
Dimensions, Weight	W260 x D400 x H200 (mm), ca.13kg		
Accessories	Power cable, signal cable, connector tube, fuse, operation manual		

*Pure water 1mL/min, PURGE OFF

**Pure water, response : 1.5sec

Refractive Index Detector

Shodex RI-201

The RI-201 is a highly sensitive RI detector incorporating a three-chamber flow cell.

<Features>

- A novel optical system (three-chamber flow cell) provides at least twice the sensitivity of our previous detectors.
- The double temperature control method significantly reduces drift caused by room temperature fluctuations.
- The limit of detection for saccharides is approximately 2ng.



Refractive Index Detector

Shodex RI-201H

<Features>

- Uses the same optical system as that of RI-101.
- Reasonable price

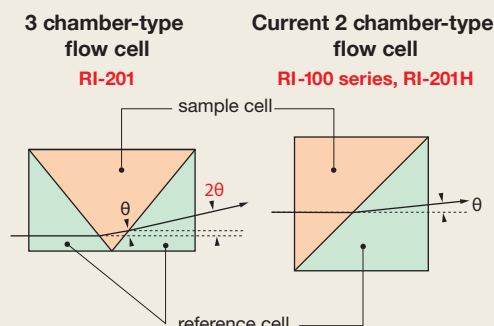
Product Code	F4010105	F4010106
Model	RI-201	RI-201H
	Analysis	
Flow cell type	3 chamber-type	2 chamber-type
Measurement method	Deflection type	
Refractive Index range	1.00~1.75	
Measurement range	0.125~256RIU	0.25~512RIU
Drift *	0.1μRIU/h	0.2μRIU/h
Linearity range	≥ 300μRIU	≥ 600μRIU
Noise **	≤ 1nRIU	≤ 2.5nRIU
Response	0.1, 0.25, 0.5, 1, 1.5, 2, 3, 6sec	
Auto zero	Full auto zero	
Auto zero range	All range	
Off-set range	5μRIU	10μRIU
Off-set resolution	25nRIU	50nRIU
Integrator output (Sensitivity)	DC 0~1V (4mV/μRIU, 16mV/μRIU)	DC 0~1V (2mV/μRIU, 8mV/μRIU)
Cell volume	8μL	
Flow rate	(Usual)	0.2~3.0mL/min
	(Max.)	10mL/min (solvent ; pure water)
Maximum back pressure	50kPa	
Internal volume	IN → Cell ; 80μL	IN → Cell ; 60μL
	Cell → OUT ; 600μL	Cell → OUT ; 600μL
	All (Cell → OUT) ; 690μL	All (Cell → OUT) ; 670μL
Recorder output	0~10mV/FS	
External input	—	
External Output	① READY (temperature control) ② LEAK ③ ERROR (ROM, RAM, PARAMETER, HOME-POSITION, OVER-HEAT, OPT.-BALANCE, INTENSITY)	
Temperature control	OFF, 30~55°C (1°C step), 77°C Temp. fuse (Double Temperature control)	
Communication port	USB	
Operator support function	None	
Wetted materials	Stainless steel 316, Teflon, Quartz Glass	
Power source, Power consumption	AC100~240V±10%, 50/60Hz, 150VA max	
Dimension, Weight	W260 x D400 x H150 (mm), ca. 12kg	
Accessories	Power cable, signal cable, connector tube, fuse, operation manual	

*Pure water 1mL/min, PURGE OFF

**Pure water, response : 1.5sec

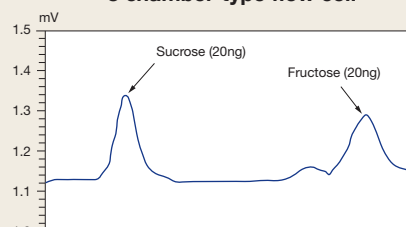
■ Principle of new optical system measurement

In our previous optical system, the measurement light passing through the flow cell was refracted only once. The new three-chamber flow cell allows the light to be refracted twice, thereby increasing sensitivity at least two-times at the same optical path length. This doubles the deflection degree and results in not only reduces the noise half, but reduces the drift caused by optical systems half.

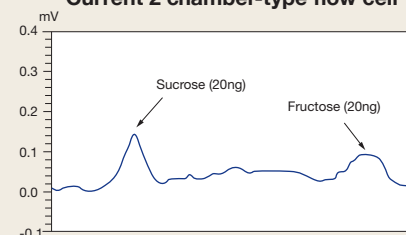


Application

3 chamber-type flow cell



Current 2 chamber-type flow cell



Electric Conductivity Detector

Shodex CD-200

The electric conductivity detector is designed for ion chromatography. It is recommended for anion or cation analysis in aqueous solution.

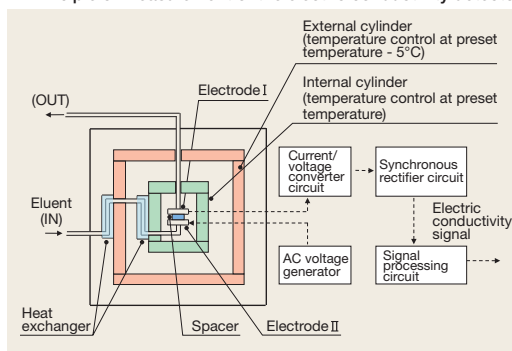
(Features)

- With use of the built-in double temperature control cell, this detector enables highly sensitive measurement.
- The detector supports a wide range of measurement and is usable for ion chromatography with or without suppressor method.

Product Code	F5515010
Model	CD-200
Measurement method	Two-electrode system
Measurement limit	0-600mS/m (0-6mS/cm)
Measurement range	0.0025-5.12mS/m, 0.025-51.2mS/m, 0.25-512mS/m
Linearity range	600mS/m
Response	0.1, 0.25, 0.5, 1.0, 1.5, 2, 3, 6sec
Auto zero limit	Same as measurement limit
Baseline shift	Range;0-2mS/m, Resolution;0.01mS/m
Integrator output	0-1V (Sensitivity:200, 20, 2mV/mS/m)
Recorder output	0-10mV/FS
External input	① ZERO IN ② MARKER IN
External Output	① READY(TEMPERATURE STABILIZED) ② LEAK ③ ERROR(ROM, RAM, PARAMETER, SENSOR, OVER HEAT, ZERO OVER) ④ MARKER OUT
Cell Temperature control	OFF, 30-50°C (1°C step), 77°C Temp. fuse
Communication port	USB
Cell volume	2.5μL
Pressure rating	1MPa
Wetted materials	Stainless steel 316, Teflon, PEEK
Dimension, Weight	W260 x D400 x H150 (mm), ca. 8kg
Power source, Power consumption	AC 100~240V±10%, 200VA max



■ Principle of measurement of the electric conductivity detector



Dissolved Gas Removal Devices

DEGASSER ERC-3215α, 3415α

The ERC-3000α series efficiently remove dissolved gases in the eluent.

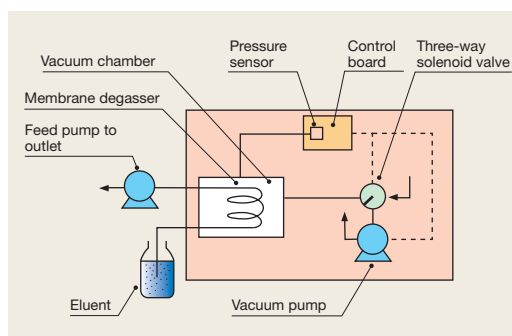
(Degassing principle)

A special synthetic resin membrane (degassing membrane) is used to selectively remove dissolved gasses; using the characteristics of the small molecular size of the dissolved gas with high mobility and affinity to the membrane.

(Features)

- Pressure sensor and leak monitor assure a high degree of safety.
- Dead volume is minimized to 7 ml/flow channel.
- Any pump can be used since differential pressure is low.
- Continuous degassing mode aids eluent preparation for high-sensitivity analysis.
- EMC and LVD compliance, with CE marking.

Product Code	Y4617000	Y4617004
Model	ERC-3215α	ERC-3415α
Solvent Channels	2 channels	4 channels
Degassing capacity	When ion-exchanged water saturated with air at 25°C is put through at a flow rate of 3 mL/min, no bubble is observed at the outlet of the apparatus. (Measured dissolved oxygen level at the outlet: 2 ppm at flow rate of 3 mL/min)	
Internal volume	7mL/Channel	
Max. Flow Rate	20mL/min for each channel (Eluent : 25°C Pure water)	
External output	An open connector signal is delivered to the external output signal terminal, when "PRES" and "LEAK" LEDs lights are on.	
Dimensions	W71 x D310 x H136 (mm)	
Power source	AC100V~AC240V, 50/60Hz	
Functions, Displays	<ul style="list-style-type: none"> • Power On/Off display : "POWER" LED lights, when the power is supplied. • Status monitoring function : "READY" LED lights, when the internal pressure in the vacuum chamber is below a predetermined limit. • Pressure monitoring function : "PRES" LED lights, when the internal pressure in the vacuum chamber does not reach a predetermined level within a predetermined time. • Leak monitor : "LEAK" LED lights, when the liquid leaks in the apparatus. • Self cleaning : The vacuum line is cleaned by air suction. • Vacuum pump operation switching function: NORM. : Controlled operation in normal run CONT. : Continuous operation in case of high degree of degassing 	
Weight	ca. 5.1kg	ca. 5.5kg



● In addition to this product, various degassers are available including the six-flow channel type and the high flow rate type. For details, please contact Shodex or our distributors near you.