

Sr.#	DESCRIPTION	QTY.
1	<b>PORTABLE PEN RECORDER</b> <i>or equivalent.</i> <b>Model</b> : LR4110E <b>Number of Pens</b> : 4 Pens <b>Type of Input</b> : DC Voltage (0.1 mV to 200 V) Thermocouple (TC) RTD (pt-100) <b>Input Power</b> : 90-250 V AC 50/60 Hz <b>Measurement Accuracy</b> : $\pm 0.05\%$ <b>Zero Point Adjustment</b> : Freely Adjust <b>Dimension W X H X D</b> : 438 mm x 206 mm x 323 mm <b>Chart Speed</b> : 10 mm / min to 600 mm / hr <b>Chart Type</b> : Z-FOLD 20 m <b>Recording width</b> : 250 mm	01 Nos.

**MANUFACTURER:** YOKOGAWA, JAPAN.

**TERMS & CONDITIONS**

- The material will be accepted after ON-line workshop testing.
- Technical literature of the indented item is required, if available.
- Delivery of the material shall be in proper packing to avoid any damage.
- Manufacturing date of equipment / item shall be provided, if available.

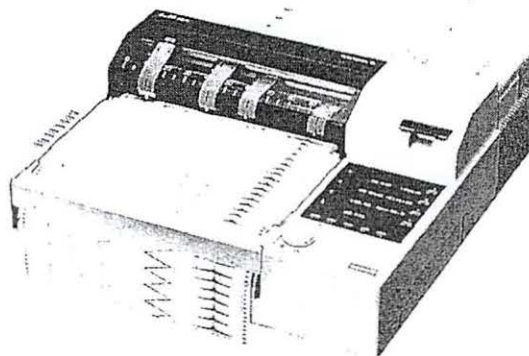
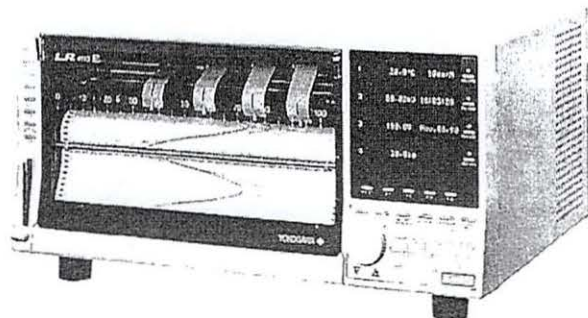
## LR SERIES RECORDERS

LR12000E/LR8100E/LR4100E/LR4200E

YOKOGAWA

NEW

NEW



**LR4100E**  
438 × 206 × 323 mm 14.5 kg (4-pen)  
(17-1/4 × 8-1/8 × 12-3/4" 32.0 lbs)

Safety Standards; EN61010-1  
EMI Standard; EN55011 Group 1 Class A  
Immunity Standard; EN50082-2 : 1995

\* The specifications for LR series recorders changes according to the type of power cord. Only the recorders having specification codes for power cords -D, -F, -G, or -J, which relate to the power cord attached, conform to EMC and safety standards; recorders with a -B specification code (with a JIS power cord attached) do not.



**LR4200E**  
448 × 185 × 445 mm 14.5 kg (4-pen)  
(17-5/8 × 7-1/4 × 17-1/2" 32.0 lbs)

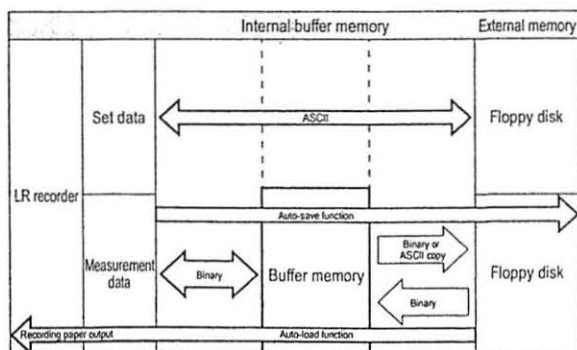
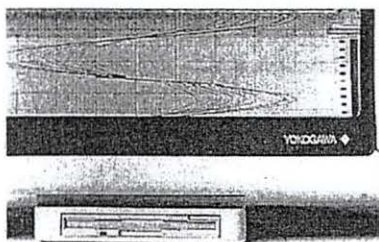
Safety Standards; EN61010-1  
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Immunity Standard; EN50082-2 : 1995

LR SERIES RECORDERS

## FUNCTIONS

## FLOPPY DISK DRIVE

Install the floppy disk drive option (FDD) and you can save the LR recorder settings to several files on a floppy disk (FD). The measurement data can also be saved to FD via the internal buffer memory provided by the FDD option. Various memory functions, including data saving, triggers, pre-triggering, auto-save/load to and from FD, and ASCII conversion all come with the FDD option.



## Auto-save

When saving measurement data, this function automatically copies the data to a FD after the data has been acquired by the internal buffer memory.

## Auto-load

When loading measurement data, this function copies the data saved on a FD to the internal buffer memory, then automatically outputs to the recording paper from the data in the internal buffer memory.

## Copying measurement data to FD

Specify either binary or ASCII format when copying data from the internal buffer memory to a FD.

## IC MEMORY CARDS

## Save settings for permanent storage (standard function)

By saving recorder settings such as range to an IC memory card, you can retrieve them later and start recording immediately—quicker than re-setting the parameters one by one. The standard 8 KB memory card can store two setting files from the LR12000E, three from the LR8100E, and five from the LR4100E or LR4200E.





## LR SERIES RECORDERS

## LR12000E/LR8100E/LR4100E/LR4200E

YOKOGAWA

## SPECIFICATIONS

Item		Model	LR12000E	LR8100E	LR4100E		LR4200E																																																											
					LR4110E	LR4120E	LR4210E	LR4220E																																																										
Measurement	Drive System	Automatic null-balancing digital servo																																																																
	Input Circuitry	Floating, guarded inputs (no guard in low-sensitivity model)																																																																
	Measuring Ranges	DC voltage (DC V): Low-sensitivity: 10 mV to 200 V F.S. Medium-sensitivity: 1 mV to 200 V F.S. High-sensitivity: 0.1 mV to 200 V F.S. Thermocouple (TC): R, S, B, K, E, J, T, N, W, L (DIN), U (DIN), KPsAu7Fe RTD: Pt100 (1 mA), JPt100 (1 mA), Pt50 (1 mA), JPt50 (1 mA), J263*B, Ni100 (1 mA)/DIN, Ni100 (1 mA)/SAMA																																																																
	Measurement Accuracy (at 23±2°C, 55±10% R.H.)	DC voltage: ±(0.05% of rdg + 0.03% of range + 1.0 μV)* Thermocouples: R, S ±(0.05% of rdg + 1°C) Below 100°C ±3.7°C 100 to 300°C: ±1.5°C B ±(0.05% of rdg + 1°C) 400 to 600°C: ±2.0°C (not guaranteed below 400°C) K, E, T, L, U ±(0.05% of rdg + 0.5°C) J ±(0.05% of rdg + 0.5°C) -200 to 100°C: ±0.7°C N ±(0.05% of rdg + 0.5°C) KPsAu7Fe ±(0.05% of rdg + 0.5°C) (not guaranteed below 4 K or above 280 K) RTD: Pt100, JPt100, Ni100 ±(0.05% of rdg + 0.2°C) Pt50, J263*B ±(0.05% of rdg + 0.3°C) <div>* In case the measurement range is 1mV, a 0.1 Hz filter must be used. For ranges more than 1 mV, no filter is necessary.</div>																																																																
	Reference Junction Compensation Accuracy	±1°C for R, S, B; ±0.5°C for other (for measured temperature of -100°C or below, add 0.5°C)																																																																
	Allowable Source Resistance	1 kΩ max. (DC voltage, thermocouple)																																																																
	Input Bias Current	4 nA																																																																
	Input Resistance	Approx. 1 MΩ (DC voltage, thermocouple)																																																																
	Filter	0.1, 1 Hz, or Off (selectable)																																																																
	Maximum Allowable Input Voltage	250 V DC + AC rms (between input terminals and case, and between input channels)																																																																
	Common Mode Rejection Ratio	150 dB (AC)																																																																
	Normal Mode Rejection Ratio	50 dB min. at 50/60Hz																																																																
	Immunity to Noise in Pulses (input/power supply terminals)	±1 kV: Pulsewise: 800 ns; Rise time: 1 ns (These data values are based on the in-house test standards.)																																																																
	Zero Point Adjustment	Freely adjustable																																																																
	Measuring Cycle	135 Hz																																																																
Pen Offset Compensation	Standard: (1) Average value recording or max./min. value recording selectable (2) Time axis resolution, 0.05 mm (3) ON/OFF switch provided (4) Auto sweepout function for pen offset data (5) Selectable pen offset compensation reference pen																																																																	
Temperature Coefficients	Zero: 0.05 μV/°C + 0.01% of range/°C; F.S.: 0.01% of range/°C																																																																	
External Input Span	Compensate for converter errors by setting the converter zero point and full-span voltages as the span left and span right values in the LR, and scale these values.																																																																	
Recording	Writing System	Disposable felt-tip pens																																																																
	Effective Recording Width	250 mm																																																																
	Pen Offset Between Channels	Approx. 3.5 mm		Approx. 4.0 mm																																																														
	Recording Accuracy	Measurement accuracy + ±0.2% of effective recording span (including linearity, dead band, error between ranges)																																																																
	Maximum Pen Speed	Approx. 1,600 mm/s																																																																
	Maximum Pen Acceleration	Approx. 78.4 m/s <sup>2</sup>																																																																
	Number of Recording Pens	10 or 12		4, 6, or 8		1, 2, 3 or 4																																																												
	Pen Colors	<table><tr><td>Pen</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>Color</td><td>Red</td><td>Green</td><td>Blue</td><td>Brown</td><td>Black</td><td>Purple</td></tr><tr><td></td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td></tr><tr><td></td><td>Orange</td><td>Violet</td><td>Teal</td><td>Yellow</td><td>Pink</td><td>White</td></tr></table>		Pen	1	2	3	4	5	6	Color	Red	Green	Blue	Brown	Black	Purple		7	8	9	10	11	12		Orange	Violet	Teal	Yellow	Pink	White	<table><tr><td>Pen</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Color</td><td>Red</td><td>Green</td><td>Blue</td><td>Brown</td></tr><tr><td></td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td></td><td>Black</td><td>Purple</td><td>Orange</td><td>Violet</td></tr></table>		Pen	1	2	3	4	Color	Red	Green	Blue	Brown		5	6	7	8		Black	Purple	Orange	Violet	<table><tr><td>Pen</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Color</td><td>Red</td><td>Green</td><td>Blue</td><td>Brown</td></tr></table>			Pen	1	2	3	4	Color	Red	Green	Blue	Brown
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Pen	1	2	3	4																																																														
Color	Red	Green	Blue	Brown																																																														
Chart	30 m Z-fold chart (DIN)		20 m Z-fold chart (DIN)		20 m Z-fold chart (DIN) 20 m roll (DIN) (Option/ROL or REROL required)																																																													
Chart Speed	10 to 600 mm/min and mm/hour		10 to 1,200 mm/min and mm/hour (1-mm steps)																																																															
Chart Speed Change	Selection between Speed 1 and Speed 2 using remote control signal (optional)																																																																	
Chart Drive	Pulse motor																																																																	
Chart Speed Accuracy	±0.1% (When running 1 m or more continuously and related to the grid of the chart paper)																																																																	
Recording ON/OFF	1 key per channel ON: Measurement + recording OFF: Measurement only (lifts pens and parks them far right)																																																																	
Pen Lift	Lifts or lowers all pens simultaneously (pens can be lifted/lowered individually with Recording ON/OFF keys)																																																																	
Partial Expansion/Compression	Both scale compression boundary values (measured values) and recording position (1% steps) can be set.																																																																	
Auto Span Shift	In auto span shift mode, span automatically shifts ±50% if input goes outside present span, and recording continues. Effective within ±10% of selected																																																																	
Printing	Printing System	Wire dot, ink ribbon (one color)																																																																
	Printing Speed	Approx. 1.5 s/line																																																																
	Printing Character Set	Alphanumeric characters (upper-case)																																																																



## LR SERIES RECORDERS

LR12000E/LR8100E/LR4100E/LR4200E

YOKOGAWA

Model		LR12000E		LR8100E		LR4100E		LR4200E		
Item						LR4110E	LR4120E	LR4210E	LR4220E	
Printing	Printout Types	TAG No. print: User-set tag can be printed in place of channel number (7 characters max.) Alarm print: Channel number, alarm type, ON/OFF time Scale print: Prints 0% and 100% scale values at same interval as for periodic print. Change of chart speed print: Prints time and post-change chart speed when chart speed changes. List print: Prints all setup information (ranges, alarms, etc.) on chart. Manual print: Prints time and measured values of all channels on one line when MANUAL PRINT key is pressed. Message print: Prints user-defined messages up to 70 characters long, with time. MESSAGE (0): Printed when MANUAL MESSAGE key is pressed. MESSAGE (1 to 4): Provided with REMOTE option; printed on reception of external contact input (4 points max.) Change of range print: Prints time and change when range changes in auto span shift mode. Pen offset compensation ON/OFF print: Prints time and pen offset compensation ON/OFF mark when pen offset compensation is turned ON or OFF. Periodic print: Prints time, chart speed, channel No. (TAG), measured data, and units at fixed intervals.								
		Chart speed and printing interval for LR8100E/4100E/4200E				Chart speed and printing interval for LR12000E				
		mm/min	mm/h	Printing interval		mm/min	mm/h	Printing interval		
		1200 to 300	—	1 minute		600 to 300	—	1 minute		
Display		299 to 30	—	10 minutes		299 to 30	—	10 minutes		
		29 to 10	1200 to 120	1 hour		29 to 10	600 to 120	1 hour		
		—	119 to 60	2 hours		—	119 to 60	2 hours		
		—	59 to 40	3 hours		—	59 to 40	3 hours		
		—	39 to 20	6 hours		—	39 to 20	6 hours		
		—	19 to 10	12 hours		—	19 to 10	12 hours		
	Display	Fluorescent display (5 × 7 dot, matrix). 20 characters per channel								
	Display Modes	(1) Digital data display: 7-digits measured value (sign, measurement data, unit, decimal point, alarm status), time, chart speed * (2) Bar graph display (2.5% resolution) * (3) Range data display (zero, span) * (4) Digital data display for all channels (LR12000E only): 7-digits measured, unit, alarm status Any of (1), (2), or (3) can be selected with the DISPLAY SELECT key. *: The LR12000E displays these items for the first six channels and the second six channels as selected.								
	Other Functions	Alarm	Number of levels: 2 levels/channel; Types: High, low, delta high, delta low. Outputs (optional): 12 internal points (LR12000E), 8 internal points (LR8100E) or 4 internal points (LR4100E/LR4200E), all with 24 V AC, 1 A contact rating							
		Computation	(1) Scaling Input voltage range: Must be within measurement range. Scaling range: -22000 to +22000 (user-set decimal point) (2) Difference computation between any two channels set to the same range code							
General Specifications	IC Memory Card	Setup data memory (standard) Memory capacity: 8 KB (with lithium battery, life approx. 5 years) *Cannot be specified with suffix code/FDD at the same time. Setting life storage capacity LR12000E: Approx. 2 files; LR8100E: Approx. 3 files; LR4100E/LR4200E: Approx. 5 files								
	System Error Alarm (FAIL)	If CPU fails, "FAIL" LED (red) lights and FAIL contact signal (optional) is output.								
	Chart End Output	When chart end is reached, "CHART" LED (red) lights, pens lift, and recorder is placed in monitor status (relay output is optional).				When chart end is reached, "CHART" LED (red) lights, pens lift, and recorder is placed in monitor status (relay output is optional); pens are not lifted in LR4120E and LR4220E.				
	Power Consumption	Max: 10 pens: 380 VA 12 pens: 450 VA  Balanced: 10 pens: 170 VA 12 pens: 190 VA	Max: 4 pens: 240 VA 6 pens: 290 VA 8 pens: 340 VA  Balanced: 4 pens: 120 VA 6 pens: 135 VA 8 pens: 150 VA	Max: 1 pen: 155 VA 2 pens: 180 VA 3 pens: 205 VA 4 pens: 230 VA  Balanced: 1 pen: 90 VA 2 pens: 100 VA 3 pens: 105 VA 4 pens: 110 VA	Max: 1 pen: 155 VA 2 pens: 180 VA 3 pens: 205 VA 4 pens: 230 VA  Balanced: 1 pen: 90 VA 2 pens: 100 VA 3 pens: 105 VA 4 pens: 110 VA					
	Dimensions (W) × (H) × (D)	Approx. 438 × 273 × 434 mm		Approx. 438 × 273 × 310 mm		Approx. 438 × 206 × 323 mm		Approx. 448 × 455 × 185 mm		
	Weight	10 pens: Approx. 19.5 kg 12 pens: Approx. 20.5 kg		4 pens: Approx. 16.5 kg 6 pens: Approx. 18 kg 8 pens: Approx. 18.5 kg		1 pen: Approx. 13 kg 2 pens: Approx. 13.5 kg 3 pens: Approx. 14 kg 4 pens: Approx. 14.5 kg		1 pen: Approx. 13 kg 2 pens: Approx. 13.5 kg 3 pens: Approx. 14 kg 4 pens: Approx. 14.5 kg		
	Clock	With calendar function								
	Position	Vertical								
	Memory Backup	Internal lithium battery for memory backup (life approx. 10 years at room temperature)								
	Operating Environment	0 to 40°C, 30 to 80% R.H. (5 to 40°C, 30 to 80% R.H. if suffix code/FDD is specified)								
Recommended Calibration Conditions	For measurement ranges less than 1 mV: 6 months For measurement ranges not less than 1 mV: 12 months (environment with proper ventilation and at 23±5°C)									
Withstanding Voltage	1,500 V AC between power supply and case for 1 minute									
Insulation Resistance	100 MΩ min. at 500 V DC between power supply and case, and between input terminals and case									
Power Supply	Allowable power supply voltage: 90 to 132 V AC/180 to 250 V AC/48 to 63 Hz. Rated power supply voltage: 100 to 120 V AC/200 to 240 V AC, 50/60 Hz (universal power supply for LR8100E, LR4100E, and LR4200E), (automatic power supply selection for LR12000E)									