

LP200

Continuous-line Recorder



ABOUT

The Line Printer 200 continuous-line recorder with four line channels or three line channels and one printer channel is equipped for trend recording. The line channels are of Class 0.5 and the printer channel is of Class 1.

The printer system in the recorder registers measured values and prints out alphanumeric texts. The measured values are registered at equidistant point intervals.

FEATURES

- 1 to 4 measuring channels
- Format 144 mm x 144 mm; installed depth 250 mm
- Combined chart unit; roll or folded
- Write width: 100mm
- Channels galvanically separated and ungrounded
- Universal input: DC, T/C, PT100
- Printer Channel (option)
- RS-485 interface
- Paper feed till 1200mm/h

7 DIFFERENT MODELS

LP201 – One channel

LP202 – Two channels

LP203 – Three channels

LP204 – Four channels

LP202P – 2 channels incl. 1 printer channel

LP203P – 3 channels incl. 1 printer channel

LP204P – 4 channels incl. 1 printer channel



STANDARD

95V..240V AC/DC

Plastic door

(Top) No scale or 0 to 100

(Down) No scale

Parameter Setting

No limit and binary inputs

OPTIONS

24 V...85 V AC/DC

Metal door with glass

Custom demand

Custom demand

Custom demand

with limit and binary inputs

Specifications

Continuous-line Recorder

Power supply

95 V, -10 % ... 240 V, +10 % UC
24 V, -25% ... 85 V, +10 % UC
Frequency range: 47.5...63 Hz
max. complement approx. 20 W / 25 VA

RS 485 interface

- a) for parameter-setting
- b) link to higher-order systems for bidirectional data transmission.

The data protocol is based on the PROFIBUS standard

Options

Alarm value monitoring

- 2 alarm values per channel for absolute value monitoring
- 4 internal relays can be freely assigned to the alarm values

Output

Floating contact (the contacts are interconnected)

Contact load

30 VA/100 mA; $\cos \phi \geq 0.5$ (only permissible for connection of functional extra-low voltage circuits)

Event marking (only version with printer channel)

- 2 markers possible
- Recording at approx. 2 % and 5 % recording width
- Control voltage 24 V DC/6 mA external
- External speed changeover
- Control voltage: 24 V DC/6 mA external
- Standby function
- Control voltages: 24 V DC/6 mA external

General and safety data

Environmental capabilities

Climatic category 3K3 acc. to
DIN IEC 721-3-3

Ambient temperature
0...25...50 °C

Transport and storage temperature
-40...+70 °C

Relative humidity
<75 % annual average, max. 85 %
Avoid condensation. Pay attention to
air humidity on recording paper acc.
to DIN 16 234

Mechanical capabilities

Tested acc. to DIN IEC 68-2-27 and
DIN IEC 68-2-6 during transportation

Shock 30 g/18 ms
Vibrations 2 g/5...150 Hz

In operation
Vibrations 0.5 g / ± 0.04 mm / 5...150 Hz / 3
x 2 cycles

Specifications

Continuous-line Recorder

Measure component

Error limit acc. to IEC 484, referred to the nominal range.

LS200	Class 0.5
LS200P	Class 0.5 for measuring channel blue, red and green class 1 for violet measuring channel

Where lower-range value and/or upper-range value shifted, additionally

$$\pm (0.1\% \times \frac{\text{nominal range}}{\text{scale span}} - 0.1)$$

Dead zone: 0.25 % of scale span

Response time: 2 seconds

Measured value damping

with 1st-order low-pass; time constant 0...60 s per measuring channel, parameterizable

Measurement variable / nominal ranges

Standard version

Direct current

0...20 mA; R, approx. 50 Ω
4...20 mA; R, approx. 50 Ω
± 20 mA; Ri approx. 50 Ω

Direct voltage

± 10 V, Ri = 1 MΩ

Universal version

Direct current

0...20 mA; Ri approx. 50 Ω
4...20 mA; Ri approx. 50 Ω
± 20 mA; Ri approx. 50 Ω

Direct voltage

± 75 mV, Ri ≥ 2 MΩ

± 20 V, Ri > 200 kΩ

Thermocouples, Ri ≥ 2 MΩ

Type B	100...+1820 °C
Type E	0...+1000 °C
Type J	0...+1200 °C
Type K	0...+1372 °C
Type L	0...+ 900 °C
Type N	0...+1300 °C
Type R	0...+1769 °C
Type S	0...+1769 °C
Type T	0...+ 400 °C
Type U	0...+ 600 °C

Reference junction internally or externally parameterizable
sensor monitoring parameterizable

Resistance thermometers

Pt 100 in 2- or 3-wire circuits
-50...+500 °C, -50...150 °C
Line resistance max. in 2-wire circuit: 10 Ω
Line resistance max. in 3-wire circuit: 40 Ω

Measuring ranges

Lower-range value of 0...80 % of respective nominal range parameterizable

Span of 20...100 % of respective nominal range parameterizable

Root-extraction function in direct current and direct voltage nominal ranges parameterizable

Effects

Temperature

$$[\pm 0.2 + (0.05 \times \frac{\text{nominal range}}{\text{scale span}} - 0.05)] \% / 10 \text{ K}$$

± 1 °C / 10 K for internal reference junction correction

Reference temperature 25 °C

Supply voltage

0.1 % for 24 V, -25 % ... 85 V, +10 % UC
0.1 % for 95 V, -10 % ...240 V, +10 % UC

Parasitic voltage

0.5 % of measuring span

External magnetic field 1 mT

0.5 % of measuring span

Mechanical capability

during and after effect ± 0.5 % of measuring span

Specifications

Continuous-line Recorder

Recording

Scale

one graduation depending on measuring system
Scale plate width: 5 mm
Character size: 2 mm

Operating and display panel (only for parameter-setting)

Display
5-digit 7-segment display
Character size 4 x 7 mm
Operation with 3 keys

Recording

Arrangement of measuring elements and colour assignment:

Without printer channel

LinePrinter LS200	Number of line channels			
	1	2	3	4
			X	X
		X	X	X
	X	X	X	X
				X

LinePrinter LP200 Number of line channels

	1	2	3	4
			X	
		X	X	
	X	X	X	
				(text printout)

with printer channel, violet will be used for text printout

Recording

Fibre-tip pen with reservoir,
distance between tips of fibre-tip recording pens 2mm
capacity approx. 1,4ml, trace length approx. 1300m

Printing

In addition to trend recording, the violet measuring channel can be used to printout texts.
Trace spacing between the green, red and blue channels: 2 mm
Trace spacing between the blue and violet channels: 6mm
The measured value of the violet channel is recorded in the form of a multipoint line with equidistant spacing.
Ink reserve of the print head is 1.5×10^6 dots approx.

Text printing for:

- Eight text lines with 16 characters each.
A time printout is appended to each text line. Initiation, cyclic, at parameterizable intervals or event-dependent by way of internal alarm values or external actuation (binary inputs).
- Printout, paper feed, date and time Initiation when recorder is switched on and on paper feed switchover.
- Printout out time and date Initiation cyclic, at parameterizable intervals or event-dependent by external actuation.
- Printout of current measured values. Initiation cyclic, at parameterizable intervals or event-dependent by internal/external actuation.
- Printout of double lines allocated to measuring points. First line: Scaling line with channel identification and printout of unit. Second line: Measuring point-specific text with max. 32 characters.
- Listing of all active parameters. Initiation manual in parameter-setting mode.

Text printing

Only possible at paper feeds ≤ 240 mm/h

Font size

Approx. 1.5×2 mm

Chart speed

0/2.5/5/10/20/30/60/120/240/300/600/1200 mm/h
external changeover for optional speed

Charts 32 m roll chart or 16 m fouled chart

Visible chart length 60 mm

Recording width 100 mm

(chart width 120 mm, DIN 16 230)

Chart feed-in (with continuous rollpaper)

via automatic take-up reel (daily chart tear-off or take-up of 32 m possible)

Specifications

Continuous-line Recorder

Interference immunity: Tested acc. to IEC 801

Type of test	Test intensity	Effect	Severity
Burst (5/50 ns) on mains line measuring line	2 kV	≤ 1 %	3
	1 kV	≤ 1 %	3
Surge (1,2/50 μs) on mains line common differential	2 kV	≤ 1 %	3
	1 kV	≤ 1 %	2
HF field radiated 80 MHz...1 GHz conducted 0.15...80 MHz	10 V/m	≤ 1 %	3
	10 V	≤ 1 %	3
1 MHz pulse on mains line common differential	2 kV	≤ 1 %	3
	1 kV	≤ 1 %	3
ESD (1/30 ns)	6 kV	≤ 1 %	3

The NAMUR industrial standard RMC are met.
(Interface lines shielded)

Permissible parasitic voltages

	Standard version	Universal version
Serial parasitic voltage Peak to peak	< 0.3 x span max. 3 V	≤ 3 x span max. 3 V
Normal mode rejection	35 dB	35 dB
Common mode parasitic voltage	60 V DC 250 V AC	60 V DC 250 V AC
Common mode suppression	83 dB for DC 96 dB for AC	83 dB for DC 96 dB for AC

Electrical safety

Tested acc. to DIN EN 61 010-1 (Classification VDE 0411) or IEC 1010-1

Class of protection: I

Overvoltage category

III at mains input

II at inputs and outputs

Degree of pollution: 2 within the device and at the terminals

Test voltage

3.75 kV measuring channels against power supply

2.20 kV earthing conductor against power supply

Functional extra-low voltage (PELV)

between mains input – measuring channels, control lines, interface lines

to VDE 0100 part 410 and VDE 0106 part 101

Connection, housing and mounting

Electrical connections

Degree of protection IP 20

Threaded-head terminals for measuring inputs, control inputs and alarm value relay outputs.

Max. wire cross-section 2 x 1 mm²

Screw terminals for mains connections

Max. wire cross-section 1 x 4 mm²

RS 485 interface via 9-pin SUB-D connector

Housing

Moulded plastic for panel

Degree of case protection acc. to IEC 529

Front IP 54; Rear IP 20

Case colour

Pebble grey to RAL 7032

or grey-white to RAL 9002

Case door

Moulding material

option: metal frame door with glass

Mounting orientation

lateral (-30°...0...+30°), inclination towards the back 20°, towards the front 20°

Mounting distance

horizontal or vertical 0 mm, case door must open at 100°

Weight: approx. 3.5 kg

Specifications

Continuous-line Recorder

International standards

IEC 484	DIN 43 782	Compensation recorders
IEC 1010-1	DIN EN 61 010-1	Electrical Safety (Test voltages)
IEC 664	VDE 0110	Insulation class
IEC 68-2-6	DIN IEC 68-2-6	Mechanical capabilities (Vibrations)
IEC 68-2-27	DIN IEC 68-2-27	Mechanical capabilities (Shock)
IEC 529	DIN 40 050	Degree of protection
IEC 801	DIN VDE 0843	Immunity of electromagnetic
EN 60 801		magnetic interference against electromagnetic influences
IEC 721-3-3	DIN IEC 721-3-3	Environmental capabilities
IEC 742	DIN EN 60 742	VDE 0551 classification Safety transformer

German standards

DIN 16 234	Recording chart paper
DIN 43 802	Scales
DIN 43 831	Cases

Setting basic parameters

If no individual parameter-setting is requested when a recorder is ordered, the Line 200 is supplied with the following parameter setting:

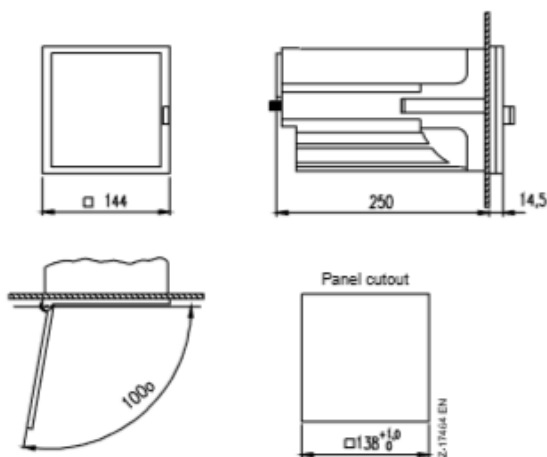
- All measuring channels with measuring range 0...20 mA
- Speed 1: 20 mm/h
- Speed 2: 120 mm/h
- Speed 3: off
- Alarm values are set at end positions (0 and 20 mA)
- Measured value damping, zoom, printer and alarm value functions are deactivated
- No password assigned
- These parameter settings can be initialized at any time with the recorder in service mode

Basic supply

(part of delivery scope)

- 1 Operating Manual
- 2 Fastening elements
- 1 Roll chart or folded package
- 1 Fibre-tip recording pen per channel (inside unit)
- 1 Ink head (for recorder version with printer channel)

Dimensional diagram (dimensions in mm)



Van Renesse Supplies B.V. reserve the right to alter specifications of the equipment described in this documentation without prior notice

Ordering information

Continuous-line Recorder

Items - No.	80063 -								
LinePrinter LS200									
Version									
1 measuring channel	M1								
2 measuring channels	M2								
3 measuring channels	M3								
4 measuring channels	M4								
1 measuring channel + text print	M5								
2 measuring channels + text print	M6								
3 measuring channels + text print	M7								
measuring range									
0..20 mA, 4..20 mA, 0..10 V DC	A1								
Universal: 1 measuring channel	A2								
2 measuring channels	A3								
3 measuring channels	A4								
4 measuring channels	A5								
Power supply									
95 V..240 V AC/DC				E5					
24 V..85 V AC/DC				E6					
Recording									
Rollenpapier (32 m lang)				R1					
Faltpapier (16 m lang)				R2					
Case									
RAL 7032 with moulded door						T1			
RAL 9002 with metal frame door						T3			
parameter definition									
Standard						P1			
as specified						P2			
Alarm monitoring and binary inputs									
without								G0	
with								G1	
Create the required Code No. for each channel									
Scale: (without ruler) numeral height 2 mm; scale height 5 mm									
1 measuring channel						S3			
2 measuring channels						S4			
3 measuring channels						S5			
4 measuring channels						S6			
without							4	0	
0..100							4	1	
as specified (clear text)							4	2	
Measuring point label									
without						V5	0	0	
with label (height 3 mm, max. 31 character/channel) (clear text)						V5	7	7	

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