VAN RENESSE supplies

LP200

Continuous-line Recorder

ABOUT

The Line Printer LP200 is a 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	OPTIONS
95V..240V AC/DC	24 V...85 V AC/DC
Plastic door	Metal door with glass
(Top) No scale or 0 to 100	Custom demand
(Down) No scale	Custom demand
Parameter Setting	Custom demand
No limit and binary inputs	with limit and binary inputs

RECORDERS & DATA ACQUISITION

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Specifications

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 ϕ ≥ 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

RECORDERS & DATA ACQUISITION

Specifications

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

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

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

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

± 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

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Specifications

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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

▲	Green			X	X
▲	Red		X	X	X
▲	Blue	X	X	X	X
▲	Violet				X

LinePrinter LP200 Number of line channels

                                         1   2   3   4
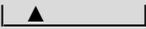
▲	Green				X
▲	Red		X	X	
▲	Blue	X	X	X	
▲	Violet	(text printout)			

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:

1. 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).

2. Printout, paper feed, date and time Initiation when
   recorder is switched on and on paper feed
   switchover.

3. Printout out time and date Initiation cyclic, at
   parameterizable intervals or event-dependent by
   external actuation.

4. Printout of current measured values. Initiation
   cyclic, at parameterizable intervals or event-
   dependent by internal/external actuation.

5. 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.

6. 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 x 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 foulded 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)

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Specifications

Interference immunity: Tested acc. to IEC 801

Type of test	Test intensity	Effect	Severity
Burst (5/50 ns) on			
mains line	2 kV	≤ 1 %	3
measuring line	1 kV	≤ 1 %	3
Surge (1,2/50 µs) on			
mains line common	2 kV	≤ 1 %	3
differential	1 kV	≤ 1 %	2
HF field			
radiated			
80 MHz...1 GHz	10 V/m	≤ 1 %	3
conducted			
0.15...80 MHz	10 V	≤ 1 %	3
1 MHz pulse on			
mains line common	2 kV	≤ 1 %	3
differential	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 inpits, control inputs and alarm value relay outputs.
   Max. wire cross-section 2 x 1 mm^2
   Screw terminals for mains connections
   Max. wire cross-section 1 x 4 mm^2
   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

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Specifications

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)
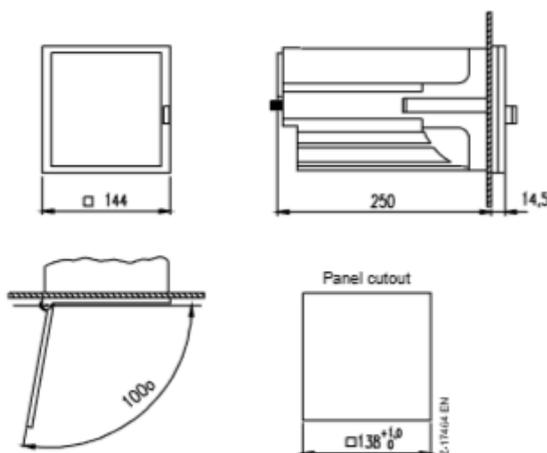
□ 144
250
14,5
1000
Panel cutout
□138 +1,0 0

RECORDERS & DATA ACQUISITION

Ordering information

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