

## PM200

### Continuous-line Recorder



#### ABOUT

The Point Master 200 is a microcontroller-based multipoint recorder which is available in two different version.

The recorder can be connected to transmitters and/or attached directly to thermocouples or resistance thermometers.

Additional functions such as the text printout, the balance sheet and the use of event markings enhance the information value of the logged process variables. Alarm signaling and remote control features contribute to make the PM200 a highly versatile instrument. The standby function supports triggered recording.

#### FEATURES

- 6 measuring channels
- Optional LED Display
- Format 144 mm x 144 mm; installed depth 250 mm
- With text printout
- 2 alarm values per measuring channel
- Report function
- 4 event markers
- Connection of process signals, thermocouples and resistance thermometers
- Channels are electrically isolated and ungrounded

#### 2 DIFFERENT MODELS

PM201 – LED display

PM202 – Scale display



#### STANDARD

95 V...240 V AC/DC  
Parameter definition  
Plastic door  
No limit and binary inputs  
Scale 0...100

#### OPTIONS

24V ... 85 V AC/DC  
Custom demand  
Metal door with glass  
with limit and binary inputs  
Custom demand

## Specifications

## Continuous-line Recorder

### Chart speed

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: 100mm (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)

### Power supply

95 V, -10 % ... 240 V, +10 % UC

24 V, -25% ... 85 V, +10 % UC

Frequency range: 47.5...63 Hz

Power consumption: approx. 20 W / 25 VA

### International standards

IEC 848	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 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

### 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 682-27 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 /  $\pm$  0.04 mm / 5...150 Hz / 3  
x 2 cycles

### 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

## Specifications

## Continuous-line Recorder

### Measuring section

#### Deviation

Class 0.5 acc. to IEC 484, referred to nominal range  
Additionally, if location of start and/or end of measurement changes:

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

#### Dead zone

0.25 % of scale span

#### Response time

1 s

#### Print cycle time for all channels

3...360 s, variable

#### Measuring value damping

using first-order-low-pass filter; time constant 0...60s per measuring channel, can be parameterized

### Measured variable / nominal ranges

#### Direct current

0...20 mA, 4...20 mA; R, approx. 50 Ω

± 2,5 mA; R, = 50 Ω

± 5 mA; R, = 50 Ω

± 20 mA; R, = 50 Ω

#### Direct voltage

0... 25 mV; ± 25 mV, R, ≥ 2 MΩ

0...100mV; ± 100mV, R, ≥ 2 MΩ

0...500mV; ± 500mV, R, ≥ 2 MΩ

0...2,5 V; ± 2,5 V, R, ≥ 200 kΩ

0...5 V; ± 5 V, R, ≥ 200 kΩ

± 10 V, R, ≥ 200 kΩ

± 20 V, R, ≥ 200 kΩ

#### Thermocouples, R, ≥ 2 MΩ

Type B, E, J, K, L, N, R, S, T, U

The nominal measuring range corresponds to the definition ranges of the selected types.

Reference junction parameters can be entered internally or externally.

Sensor break monitoring can be activated.

#### Resistance thermometer

Pt 100 in 2- or 3-wire circuit

-50...+150 °C; -50...+500 °C; -200...850 °C

Max. line resistance of

2-wire circuit: 40 Ω

3-wire circuit: 80 Ω

### Measuring ranges

#### Start of measuring range

can be parameterized over 0...80 % of the given nominal range

#### End of measuring range

can be parameterized over 20...100 % of the given nominal range

#### Square-root function

can be parameterized for direct current and direct voltage nominal ranges

#### User linearization

can be parameterized for direct current and direct voltage nominal ranges

### 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, +1- % UC

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

Parasitic voltage: 0.5 % of measuring span

#### External magnetic field 0.5 mT

0.5 % of measuring span

#### With shock and vibration

± 0.5 % of measuring span during and after the effect

## Specifications

## Continuous-line Recorder

### Recording section / measured value display

#### Scale design

##### Scale

1 to 6 graduations

Character size for specific number of graduations:

Graduations	1	2	3	4	5	6
Character size (mm)	4	4	4	2	2	2

##### Channels display

by vertical row of LEDs on left hand side of scale

##### Scale/channel assignment

by vertical row of LEDs on right-hand side of scale

##### Operator and display panel

(behind the chart unit)

##### Display (for entering parameters only)

5-digit, 7-segment display

Numeral size 4 x 7 mm

##### Operation

with a function key on the rear of the scale plate  
and 3 keys behind the chart unit

### Display versions

The displays are used in the operation mode to display tag number (single-digit), measured value (5-digit), dimensional unit (7-digit), alarm status.

Parameters and parameter values are displayed in the parameter definition mode.

##### LC display (illuminated)

16-digit; character size 3.1 x 5.5 mm

##### Operation

with one function key on the display and 3 keys  
behind the chart unit

##### LED display

16-digit; character size 3 x 5 mm

##### Operation

with 6 keys on the display

### Recording

#### Colours

violet, red, black, green, blue, brown

Colour sequence acc. to DIN 43 838

Channel 1 violet

Channel 2 red

Channel 3 black

Channel 4 green

Channel 5 blue

Channel 6 brown

alternatively, can be freely assigned to  
channels

Last dot visible from the front

Ink supply  $\geq 1 \times 10^6$  dots per colour

### Recording trends

The measured values are recorded as a dotted line  
with equidistant dot spacing

#### Operating modes

##### Cyclical mode – process all channels

##### Recording

all channels are updated during the cycle time

##### Measured value display

Either one measuring channel continuously or  
channel stepping from cycle to cycle

### External control

##### Recording

The channels selected externally by DI1...DI6  
are recorded, start of recording can be delayed  
by 0...60 s

##### Measured value display

Channel stepping from cycle to cycle  
Option "Alarm monitoring and binary inputs"  
required

##### Cyclical mode – external signaling

##### Recording and measured value display

The displayed channel is updated during the cycle  
time. DO1...DO6 signals that the measuring  
channel  
has been through-connected.  
Option "Alarm monitoring and binary inputs"  
required

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

## Specifications

## Continuous-line Recorder

### Recording trends

#### Event recorder for 10 events

##### Recording

The start, duration and end of event are recorded as an open square

##### Display (in the case of display version)

Last event displayed as clear text message

I/O converter required

##### Cycle time

Can be varied between 3...360 s

### Text output

Only possible with chart speeds  $\leq 240$  mm/h

##### Character size

approx. 1.5 x 2 mm

##### Scope of text output

1. Ten lines of text, each containing either
  - max. 32 characters
  - max. 30 characters and time
  - max. 24 characters and time / date
 Triggered at preset cyclic intervals or in response to events by internal (alarm values) / external initiation (binary inputs)
2. Printout of chart speed, date and time
  - Triggered when recorder is switched on and when chart speed is changed
3. Printout of current measured values
  - Triggered at preset cyclic intervals or in response to events by internal / external initiation
4. Printout of triple lines assigned to measuring points
  - Line 1: scale line with channel designation and printout of measuring unit
  - Line 2: text specific to measuring points, max. 54 characters
  - Line 3: alarm pointers
5. Printout of balance sheet table comprising:
  - Message line
  - Start and end times of balance sheet interval
  - Min./max. values during the balance sheet interval
  - Average and cumulative values over balance sheet interval
  - Triggering: cyclical and external
6. Lists of all active parameters
  - Triggered manually in parameter mode

### Chart speed

Various speeds can be defined

0/2.5/5/10/20/30/40/60/120/240/300/600/1200 mm/h

Optional: external speed switching and shutdown

Option "Alarm monitoring and binary inputs/outputs required

##### Chart paper

32 m chart roll or 16 m folded

##### Visible chart length

60 mm

##### Recording width

100 mm (chart width 120 mm, DIN 16 230)

##### Chart feed-in (roll paper)

The start of the paper engages automatically in the take-up reel

(charts torn off daily or 32 m can be wound up)

### Power supply

#### Power supply unit

95 V, -10 % ... 240V, +10 % UC

24 V, -25 % ... 85V, +10 % UC

Frequency range: 47.5...63 Hz

Power consumption: approx. 20 W / 25 VA fully equipped

### RS 485 interface

a) for parameter-setting

b) link to higher-order systems

### Mechanical features

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 /  $\pm 0.04$  mm /

5...150 Hz / 3 x 2 cycles



## Specifications

## Continuous-line Recorder

### RS 485 interface

#### "Alarm monitoring and binary input" options

External chart speed switching

Control voltage: 24 V DC / 6 mA external

Alarm monitoring

2 alarm values per channel for absolute value monitoring

6 internal relays can be freely assigned to alarm values

Output: normally open contact

(The roots of the contacts are interconnected)

Contact loading: 30 V / 100 mA

14 additional relays available via external I/O converter

Event marking

4 markings are possible

Recording at approx. 2 %, 5 %, 95 % and 98 %  
recording width

Control voltage: 24 V DC / 6 mA external

10 event markings

can be used (without measured value recording)  
via external I/O converter

Balance sheet function

The balance sheet function can be selected for each  
measuring channel. External control of the balance sheet  
interval is via a selectable binary input.

Control voltage: 24 V DC / 6 mA external

### Electromagnetic compatibility

The protection objectives of EMC guideline 89/336/EWG  
as regards radio interference suppression acc. to  
EN 55 011 and immunity to interference acc. to  
EN 50 082-2 are met.

Radio interference suppression acc. to EN 55 011

Threshold class B

German Post Office Degree 243/92

Immunity to interference

Test acc. to IEC 801 / EN 60 801

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 230 V mains line common differential 24 V mains line common differential	2 kV	≤ 1 %	3
	1 kV	≤ 1 %	2
	1 kV		
	0.5 kV		
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 is met.  
(Interface lines shielded)

### Permissible parasitic voltages

	Permissible parasitic voltage
Serial parasitic voltage Peak to peak	< 0.3 x measuring span max. 3 V
Normal mode rejection	75 dB
Common mode parasitic voltage	60 V DC / 250 V AC
Common mode suppression	83 dB for DC 96 dB for AC

## Specifications

### 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 mm<sup>2</sup>
- Screw terminals for mains connections
- Max. wire cross-section 1 x 4 mm<sup>2</sup>
- RS 485 interface via 9-pin SUB-D connector

#### Housing

- Moulded plastic for panel and mosaic panel field mounting (dimensions see dimensional drawing)

#### 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

## Continuous-line Recorder

### Default settings

#### Scale with one graduation 0...100

- will be supplied automatically if no scale graduation is specified when ordering the recorder

#### Basic parameters

- If no particular definition is given when ordering the recorder, the PS200 will be 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
- Alarm values are set to end positions (0 and 20 mA)
- Measured value damping and zoom, printer and alarm functions are off
- No password defined
- These parameter defaults can be initialized at any time when the recorder is in service mode

### 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

### Ordering information

### Continuous-line Recorder

Multipoint Recorder PointMaster 200 Standard colour RAL 7032 (pebble grey)		Catalog No. V41411A-		Code		YOUR CHOICE
Version						
PointMaster 200 S scale version			1			
Pointmaster 200 D2 with LED display			3			
Measuring range						
Universal version for: process signals, thermocouples, resistance thermometers			9			
Power supply						
95 V...240 V AC/DC			5			
24 V...85 V AC/DC			6			
Recording						
on rolled chart paper (32 m)			1			
on folded chart paper (16 m)			2			
Case						
RAL 7032 with moulded door, H&B design			1			
RAL 7032 with metal frame door (glass window), H&B design			3			
Parameter definition						
Standard			1			
as specified			2			
Alarm monitoring and binary inputs						
without			0			
with			1			
Create the required Code No. for each channel						
Scale						
Character height for 1 and 2 graduations: 5mm						
Character height for 3, 4, 5 and 6 graduations: 2mm						
1st graduation (above)			3	1		
2nd graduation			3	2		
3rd graduation			3	3		
4th graduation			3	4		
5th graduation			3	5		
6th graduation (below)			3	6		
without					0	
0...100					1	
as specified					3	
Additional						
Labelling of the tag name plate						
Character height 3mm (max. 31 characters per tag)						
Channel 1			5	7	2	
Channel 2			5	7	5	
Channel 3			5	7	8	
Channel 4			5	8	1	
Channel 5			5	8	4	
Channel 6			5	8	7	
Operating Manual						
German			Z	2	D	
English			Z	2	E	
French			Z	2	F	
Certificates						
Constructor's test certificate M acc. to DON 5535-18-4.2.2 and inspection certificate B acc. to EN 10204-3.1B			6	9	9	
Consumables		Catalog No.				
Print head		41481-0319659				
Roll chart paper						
with hourly time imprint for 20mm/h		40920-3000505				
without time imprint; with baselines		40920-3000150				
Folded chart paper						
with hourly time imprint for 20mm/h		40926-3000502				
without time imprint; with baselines		40926-3000103				