VAN RENESSE supplies

PM200

Continuous-line Recorder

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**

ABOUT

The Point Master PM200 is a microcontroller-based multipoint recorder which is available in two different version.

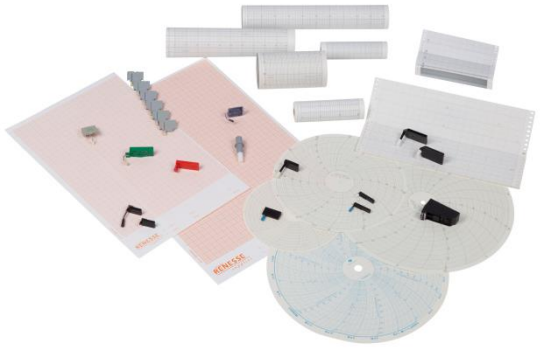
The recorder can be connected to transmitters and/or attached directly to thermocouples or resistance thermometers.

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.

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

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Specifications

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 foulded 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 / ± 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

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Specifications

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
o.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 ℃; -50…+500 ℃; -200…850 ℃
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

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

± 1 ℃ / 10 K for internal reference junction correction

Reference temperature: 25 ℃

Supply voltage
0.1 % for 24 V, -25 % … 85 V, +1- % UC
0.1 % for 95 V, -10 % …240V, +10 % UC

Parasitic voltage: o.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

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Specifications

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 ≥ 1 x 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

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Specifications

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 ≤ 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 or 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 tom off daily or 32 m van 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 / ± 0.04 mm / 5...150 Hz / 3 x 2 cycles

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Specifications

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	2 kV	≤ 1 %	3
measuring line	1 kV	≤ 1 %	3
Surge (1,2/50 µs) on 230 V mains line			
common	2 kV	≤ 1 %	3
differential	1 kV	≤ 1 %	2
24 V mains line			
common	1 kV		
differential	0.5 kV		
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 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

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Specifications

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 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

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

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Ordering information

Continuous-line Recorder

Multipoint Recorder PointMaster 200 Catalog No. V41411A- Standard colour RAL 7032 (pebble grey)	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 without time imprint; with baselines	 40920-3000505 40920-3000150
Folded chart paper with hourly time imprint for 20mm/h	40926-3000502
without time imprint; with baselines	40926-3000103