



Limit Controllers Edgewise with Moving-Coil Movement

RP 96x24
RG 96x24
RPY 96x24
RX 96x24
RP 96x48
RG 96x48
RPY 96x48
RX 96x48



Application

The limit controllers **RP/G/PY/X 96x24** and **RP/G/PY/X 96x48** having a profile dial provide continuous surveillance of Volts, Amps or temperature. If used with transducers they monitor and control frequency, Watts or Vars, power factor or any other physical variables.

Setpoint limits are scanned by electronic comparator circuits which are safe against vibration and shocks.

The controllers are available optionally with a transistor or relay output. The relay output provides either closed contacts (closed circuit principle) or open contacts (open circuit principle) having one (LOW, HIGH) resp. two (LOW/HIGH) SPDT contacts. Measuring input and outputs are electrically insulated (the transistor output only if powered by AC voltage).

Setpoint- and zero-adjustment are accessible from the front.

Functional Principle

Moving-coil movement comprising a core-type magnetic system with twin spring loaded shock absorbing jewel bearings.

An integrated electronic comparator compares the measuring input with the preselected setpoint limits and drives a transistor or relay output.

Mechanical Data

case details	edgewise case suitable to be mounted in switchboards or mosaic grid panels, stackable	
material of case	polycarbonate thermoplastics, flame retardant with UL rating of 94 V – 0	
material of window	glass ↘	
colour of bezel	black (similar to RAL 9005) ↘	
position of use	vertical ±5° ↘	
panel fixing	screw clamps	
panel thickness	1 ... 40 mm	
mounting	stackable next to each other	
terminals	connector blades 2x 2.8 mm x 0.8 mm or 1x 6.3 mm x 0.8 mm	

dimensions (in mm)	RP/G/PY/X 96x24	RP/G/PY/X 96x48
bezel	96 x 24	96 x 48
case	90.5 x 18.8	90.5 x 42.8
depth	126	126
~ with relay output	146	146
panel cutout	92 ^{+0.8} x 22.2 ^{+0.3}	92 ^{+0.8} x 45 ^{+0.6}
weight approx.	0.2 kg	0.2 kg
~ with power supply unit	–	0.5 kg

Electrical Data

measuring unit	RP DC voltage or DC current
	RG AC voltage or AC current
	RPY temperature (for thermocouples)
	RX temperature (for RTD resistance thermometer)
overload capacity	continuously 1.2 times
measurement category	CAT III
operating voltage	300 V
	600 V (measuring ranges >250 V ... ≤600 V)
pollution level	2

enclosure code IP 52 case
IP 20 terminals

Measuring Ranges

RP DC current ¹⁾ RG AC current / power consumption	DC voltage sensitivity ²⁾ RP	AC voltage power consumption RG
100 µA <0.01 VA	60 mV 1 MΩ	–
150 µA <0.01 VA	100 mV 1 MΩ	–
250 µA <0.01 VA	150 mV 1 MΩ	–
400 µA <0.01 VA	250 mV 1 MΩ	–
600 µA <0.01 VA	400 mV 1 MΩ	–
1 mA <0.01 VA	600 mV 1 MΩ	–
1.5 mA <0.01 VA	1 V 1 MΩ	–
2.5 mA <0.01 VA	1.5 V 100 kΩ	–
4 mA <0.01 VA	2.5 V 100 kΩ	–
5 mA <0.01 VA	4 V 100 kΩ	–
6 mA <0.01 VA	5 V 100 kΩ	–
10 mA <0.01 VA	6 V 100 kΩ	6 V <3.6 VA
15 mA <0.01 VA	10 V 100 kΩ	10 V <3.6 VA
20 mA ↘ <0.01 VA	15 V 100 kΩ	15 V <3.6 VA
25 mA <0.01 VA	25 V 100 kΩ	25 V <3.6 VA
40 mA <0.01 VA	40 V 100 kΩ	40 V <3.6 VA
50 mA <0.01 VA	50 V 100 kΩ	50 V <3.6 VA
60 mA <0.01 VA	60 V 2 kΩ/V	60 V <3.6 VA
100 mA <0.01 VA	100 V 2 kΩ/V	100 V <3.6 VA
150 mA <0.1 VA	150 V 2 kΩ/V	150 V <3.6 VA
250 mA <0.1 VA	250 V 2 kΩ/V	250 V <3.6 VA
400 mA <0.1 VA	400 V 2 kΩ/V	400 V <3.6 VA
600 mA <0.1 VA	500 V 2 kΩ/V	500 V <3.6 VA
1 A <0.1 VA	600 V 2 kΩ/V	600 V <3.6 VA
1.5 A <0.6 VA	↘	↘
2.5 A <0.6 VA		
4 A <0.6 VA		
6 A <0.6 VA		

¹⁾ RP voltage drop approx. 100 mV

²⁾ Sensitivity is limited to a tolerance of ±20% ↘

RP for use with external shunt

60 mV
150 mV
current consumption 6 mA ±20%

A total lead resistance of 0.050 Ω is considered in the calibration of the controller for connecting leads 1 m, 2 x 0.75 mm² ↘

RG for use on VT/CT

N/1 A, N/5 A
N/100 V, N/110 V

Please state transformer ratio when ordering.

RPY via thermocouple			RX via RTD (2- or 3-wire connection)		
measuring range	sensor	type	measuring range	sensor	
20 ... 300°C	Fe – CuNi	J	–30 ... 60°C	Pt 100	
20 ... 400°C	Fe – CuNi	J	–30 ... 150°C	Pt 100	
20 ... 600°C	Fe – CuNi	J	0 ... 60°C	Pt 100	
20 ... 600°C	NiCr – Ni	K	0 ... 100°C	Pt 100	
20 ... 900°C	NiCr – Ni	K	0 ... 120°C	Pt 100	
20 ... 1200°C	NiCr – Ni	K	0 ... 150°C	Pt 100	
20 ... 1200°C	PtRh – Pt	S	0 ... 200°C	Pt 100	
20 ... 1600°C	PtRh – Pt	S	0 ... 300°C	Pt 100	
input impedance 1 MΩ ±20%			0 ... 400°C	Pt 100	
			0 ... 500°C	Pt 100	
			0 ... 600°C	Pt 100	
			50 ... 150°C	Pt 100	
			100 ... 200°C	Pt 100	
			200 ... 400°C	Pt 100	

↘ also refer to "Options"



Limit Controllers Edgewise with Moving-Coil Movement

Scaling

pointer	bar / knife-edge pointer	
response time	1 s for full-scale deflection	
scale arrangement	horizontal (left-hand zero) ▶	
scale	linear	
characteristics		
scale division	coarse-fine	
scale length	RP/G/PY/X 96x24 65 mm	RP/G/PY/X 96x48 65 mm

Auxiliary Supply

auxiliary voltage	DC 24 V (20 ... 30 V) ▶
power consumption	≤ 4.5 W

Electrical insulation between measuring circuit, auxiliary supply circuit and output (transistor output only if powered by AC voltage ▶).

Accuracy at Reference Conditions

accuracy class 1.5 according to DIN EN 60 051 - 1

reference conditions

ambient temperature	23 °C
position of use	nominal position ± 1° ▶
input	rated measuring value
frequency	RG 50 Hz ± 2%
wave form	RG sinusoidal, distortion factor ≤ 1%
others	DIN EN 60 051

influences

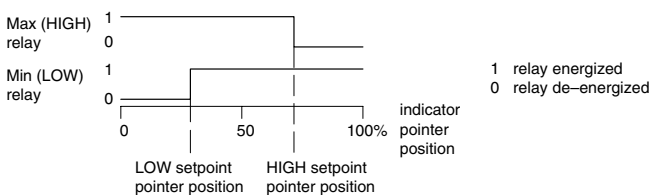
ambient temperature	23 °C ± 2K
position of use	nominal position ± 5°
frequency	RG 40 ... 50 Hz ... 10 kHz
stray magnetic field	0.5 mT

Environmental

climatic suitability	climatic class 3 according to VDE/VDI 3540
operating temperature range	-10 ... +55 °C
storage temperature range	-25 ... +65 °C
relative humidity	≤ 75% annual average, non-condensing
shock resistance	15 g, 11 ms
vibration resistance	2.5 g, 5 ... 55 Hz

Setpoints

control mode (closed circuit principle)



open circuit principle 0 and 1 reversed
 minimum span ≤ ± 1% of scale length
 differential ≤ 1% of scale length

transistor outputs

open-collector max. 24 V, 20 mA

relay outputs

1 SPDT relay on each setpoint; max. contact rating (≥ 10⁶ operations)
 contact voltage DC/AC 250 V
 contact current 6 A
 contact output 50 W / 500 VA

Options

special measuring range	deviating from standard
adjustment of internal resistance	to ± 1% at 23 °C
lead resistance	calibration to >0.05Ω
off-set zero	to special order between standard zero and centre zero
electrically suppressed relay operation	zero for measuring range 0/4 ... 20 mA open circuit principle
auxiliary voltage via ext. power supply	AC 24 V; 100/110/115 V; 220/230/240 V ± 10%, 45 ... 50 ... 65 Hz, 4 VA
	electrically insulated

case

window	non-glaring glass
colour of bezel	gray (similar to RAL 7037)
position of use	horizontal or to be specified 15 ... 165°

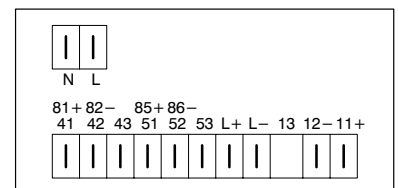
dial

scale arrangement	vertical (bottom zero)
blank dial	pencil marked initial and end values
scale division and figuring	0 ... 100%, linear, full-scale values acc. to DIN series (1 - 1.2 - 1.5 - 2 - 2.5 - 3 - 4 - 5 - 6 - 7.5 and any decimal multiple of these numbers e.g. 150 m ³ /h) or deviating from DIN series; special calibration from customer's non-linear graph or chart; scaling of voltmeters in ohms; captions optional

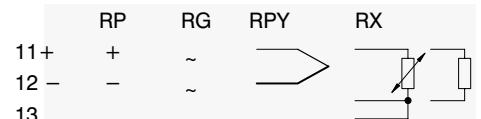
additional lettering	to be specified e.g. "generator"
additional figuring	to be specified
coloured marks	red, green or blue for important scale values
coloured sector	red, green or blue within scale division

Terminal Board

Rear Panel View



Input Signal

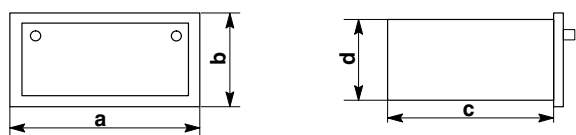


Auxiliary Supply and Setpoints

	RP/G/PY/X			
auxiliary voltage	L+	+		
DC	L-	-		
auxiliary voltage	L	L		
AC	N	N		
Minimum (LOW) relay	41		Minimum (LOW) transistor	81+
	42			82-
	43			
Maximum (HIGH) relay	51		Maximum (HIGH) transistor	85+
	52			86-
	53			

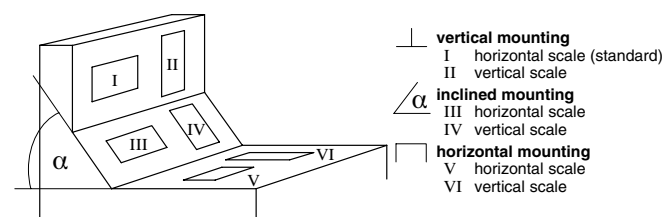
Relay positions shown refer to auxiliary voltage applied with indicator pointer not having passed above resp. below chosen setpoint limits (relays energized, closed circuit principle).

Dimensions



dimensions (in mm)	RP/G/PY/X 96x24	RP/G/PY/X 96x48
a	96	96
b	24	48
c	126	126
with relay output	146	146
d	19.5	42.5

scales and position of use



Attachment

External power supply (3 variants)

input AC 24 V; 100/110/115 V; 220/230/240 V, ±10%, 45 ... 65 Hz

output DC 24 V stabilized

Lead Adjustment Resistor 10 Ω or 20 Ω for RTD use

Test Resistor for RTD use

Ordering Information

type RP RG RPY RX	profile moving-coil controllers for DC current or voltage AC current or voltage thermocouple RTD
front dimensions 96x24 96x48	96 mm x 24 mm 96 mm x 48 mm
control function Min Max Min/Max	with Min (LOW) setpoint with Max (HIGH) setpoint with LOW & HIGH setpoint
measuring ranges	refer to preceding table
sp. measuring range	to be specified ²⁾
adjustments	internal resistance ±20% ¹⁾ internal resistance to ±1% at 23°C lead resistance >0.05 Ω
zero position	left-hand resp. bottom zero ¹⁾ off-set between standard and centre zero
outputs	relay output with 1 resp. 2 SPDT contact(s) transistor output
relay operation	closed circuit principle ¹⁾ open circuit principle
auxiliary supply	DC 24 V ¹⁾ AC 24 V AC 100/110/115 V AC 220/230/240 V
window	glass ¹⁾ non-glaring glass
colour of bezel	black (similar to RAL 9005) ¹⁾ gray (similar to RAL 7037)
position of use	vertical ¹⁾ to special order 15 ... 165° ²⁾
scale arrangement	horizontal scale, left-hand zero ¹⁾ vertical scale, bottom zero
dial	scale division and measuring range alike ¹⁾ blank dial scale division and figuring 0 ... 100% acc. to DIN series ²⁾ deviating from DIN series ²⁾ calibration fr. non-linear graph or chart ²⁾ scaling in ohms for voltmeters ²⁾ additional lettering to be specified ²⁾ additional figuring to be specified ²⁾ coloured marks red, green or blue ²⁾ coloured sector red, green or blue ²⁾

¹⁾ Standard

²⁾ Please clearly add the desired specifications.

ordering example

RP 96x24 Min(LOW)/Max(HIGH), measuring range 0 ... 60 mV, horizontal scale 0 ... 10 kA, relay output closed circuit principle, auxiliary supply AC 230 V, window non-glaring glass

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– specifications subject to change without notice; date of issue 06/11 –

