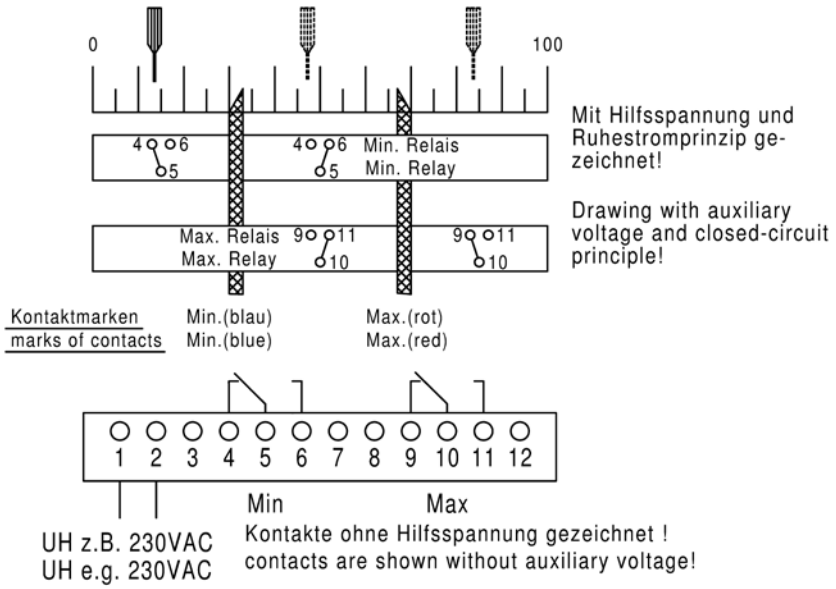
Limit controllers

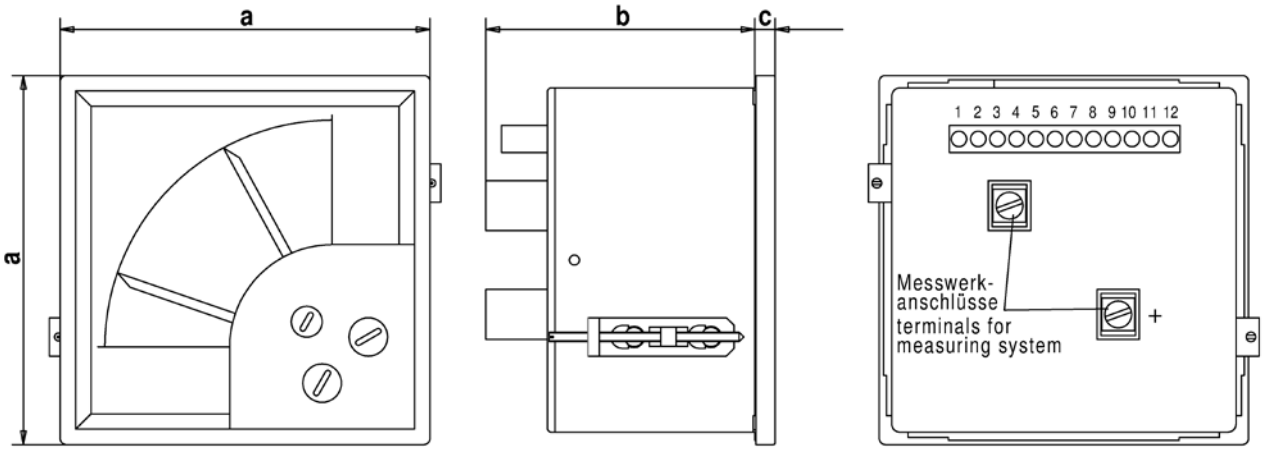
Application	Limit controllers monitor one or two limit values to be set over the entire scale range. They can be used for electrical measureable values.
Measuring system	● Moving-iron measuring system ● Moving-coil measuring system
Contact device	● Optical sampling through infrared reflected light barrier ● Nonreactive sampling ● Setting range 0-100 % (also in case of two contact marks) ● Setting of limit values at the front side
Design	For limit controllers, the same technical data and special models as for normal indicators apply. They are available in sizes 96 DIN and 144 DIN. The following variables may be measured: Direct current, direct voltage, alternating current, alternating voltage, frequency, in connection with a measuring transducer power, power factor, temperature and all other transformed non-electrical quantities. The sampling of the position of the measuring element pointer is done via a noncontact infrared reflected light barrier. A maximum of two limit values may be monitored. In case of the standard type, the relays are energized and are deenergized if the max. contact mark is exceeded or the limit value drops below the min. contact mark (closed-circuit principle). Electronics, relays and 230 V auxiliary voltage are installed; the maximum mounting depth of the device amounts to 68 mm only. The connection is made via a 12-pin terminal block for cross sections up to 4 mm². The measuring element is connected to hexagon bolts with M4 screws in case of voltmeters and ammeters up to 15 A max. 6 mm², M5 screws up to 60 A max. 16 mm² (back-of-hand-proof).
Function and connection diagram	



Technical data

	Switching accuracy	± 1 % of scale lenght, (± 0,9 mm for ..96 DIN.. or ± 1,3 mm for ..144 DIN..)
	Hysteresis	± 0,5 % of scale length, (± 0,4 mm for ..96 DIN.. or ± 0,6 mm for ..144 DIN..)
	Response delay	100 ms after limit value is exceeded
	Sampling	optical, with reflected light barrier
	Limit value adjustment	at front side via full scale range, using screwdriver
	Temperature range	-25 °C to +20 °C to +30 °C to +55 °C
	Relay contacts	1 changeover contact per limit value, max. 8 A, 250 V AC, 2000 VA
	Switching state	closed-circuit prinziple, (Relay is deengergized if limit value is exceeded)
	Auxiliary voltage	230 V AC ± 15 %, 45-65 Hz, 2 VA
	Test voltage	2,5 kV, 50 Hz, 10 s, between measuring input, housing, auxiliary voltage and relay contacts
Standards	EMC	DIN EN 61 326,
	Mechanical strength	DIN EN 61 010 part 1
	Electrical safety	DIN EN 61 010 part 1, pollution degree 2, measuring category CAT III, for working voltages up to 300 V (phase to neutral)
	Accuracy, overlaod	DIN EN 60 051
	IP code	DIN EN 60 529, housing IP 52, terminals IP 10
Special versions	Measuring range	Moving-iron measuring instruments Page 132 Moving-coil measuring instruments Page 137
	Auxiliary voltage	110 V AC ± 15 %, 45-65 Hz, 2 V 24 V AC + DC, -15 % to +25 %, 2 W, 6-30 V AC + DC, 2 VA, (EMC DIN EN 61 326 class A) 36-265 V AC + DC, 2 VA, (EMC DIN EN 61 326 class A)
	Contacts	2 max contacts or 2 min contacts
	Adjustment	using knurled knob, per contact
	Relays	Reversed switching states (open-circuit principle), per contact
	Relay contacts	2 changeover contacts (only possible for 1 contact)
	Relay delay	Fixed value between 1 and 30 s, per contact adjustable at rear side of housing 1-30 s, per contact

Dimensions



Type	Cut-out mm	a mm	b mm	c mm
WQ 96 DIN, PQ 96 DIN, PGQ 96 DIN	$92^{+0,8}$ x $92^{+0,8}$	96	70	5
WQ 144 DIN, PQ 144 DIN, PGQ 144 DIN	138^{+1} x 138^{+1}	144	70	7

Price group B