



MEASURING TRANSDUCERS FOR ACTIVE POWER

Types Pw-MU, Pnz-MU, Pz-MU, Pd-MU, Pdr-MU

General information	This operating manual is included with the equipment as standard. It contains the information required for correct usage. It is aimed at trained personnel and specialist staff who are familiar with the assembly, installation and commissioning of the product described here. If additional information is required, further details can be requested by the address given below.
Conformity	This equipment conforms to the requirements of the Directive from the Council of the European Community on the harmonisation of the member states regarding electromagnetic compatibility, EMC Directive 2004/108/EC, as well as Low Voltage Directive 2006/95/EC.
Application	The measuring transducers Pw-MU, Pnz-MU, Pz-MU, Pd-MU and Pdr-MU serve to convert and isolate the active power of alternating current and three-phase current into a load-independent direct-current and direct-voltage signal.
Function	The quantities to be measured will get via current transformer and voltage divider to the analog multiplier where the instantaneous values of current and voltage will be multiplied and in a subsequent integrating step be formed as mean value of a direct voltage which corresponds to the active power. Sinusoidal and non sinusoidal quantities of any curvature could be measured. The galvanic separation between input and output signals is effected by means of an optocoupler. The secondary amplifiers will supply the load-independent direct current and direct-voltage signals. Both outputs are no-load resistant and short-circuit proof. Any connection between both outputs will be unacceptable. In case of "live zero", fluctuating rated voltage > +/- 20 % or rated voltage >500 V an auxiliary voltage will be required.

Technical data

Input	Input quantity	Active power of alternating current or three-phase current
	Rated values	50-150 % of apparent power AC: $P_s = U \times I$ three-phase current: $P_s = U \times I \times 1,732$
	Rated voltage	100 V, 110 V, 230 V, 400 V, 500 V or 600 V (690 V in grounded installations) +/- 20 %, max. 3,5 VA
	Rated current	1 A or 5 A, 0,3 VA
	Rated frequency	50 Hz, 60 Hz or 400 Hz
	Overload, permanent	Current: 2-fold, voltage 1,2-fold
	Surge overload	Current 20-fold 1 sec., voltage 2-fold 1 sec.
Output	Output quantities	Double output
	Rated values	0-20mA /0-500 Ohm of load and 0-10V max. load 10 mA
	Option	"live zero" 4-20mA /0-500 Ohm of load and 2-10V max. load 10 mA (with aux.) <ul style="list-style-type: none"> • bipolar output (e.g.. -20 mA – 0 – +20mA and -10 V – 0 – +10V) • Zero point rise (e.g.. 0 – 10 mA – 20 mA and 0 – 5 V – 10 V) • Frequency module - a value of 0 – 5 Hz up to 0 – 10 kHz <ul style="list-style-type: none"> ○ „Open-collector“ NPN, max. 30V 100 mA loadable, impulse/break 50/50 % ○ Square wave signal 5V, max. 10 mA loadable, impulse/break 50/50 %
Dynamic system behaviour	Accuracy	+/- 0,5 %
	Voltage influence	< 0,1 % with +/- 10 % of rated voltage
	Frequency influence	< 0,3 % with difference frequency 10 Hz
	Phase angle influence	< 0,5 % with +/- 90°
	Temperature range	-15°C up to <u>+20°C</u> up to <u>+30°C</u> up to +55 °C
	Temperature influence	< 0,3 % at 10 K
	Influence of aux.	none
	Load influence	none
	External magnetic field influence	none (up to 400 A/m)
	Residual ripple	< 30 mV _{ss}
	Response time	< 300 ms (with frequency module < 400 ms)
	No-load voltage	max. 24 V
	Current limitation	max. 2-fold in case of saturation
	Testing voltage (working voltage up to 300V)	4 kV between input and output, input and aux., output and aux.
	Testing voltage (working voltage up to 600V)	4 kV between output and aux., 5,2 kV between input and output aux. 230 VAC and 110 VAC: 4 kV between input and aux. aux. 24 VDC, 6-30 V AC/DC and 36-265 V AC/DC: 5,2 kV between aux. and input



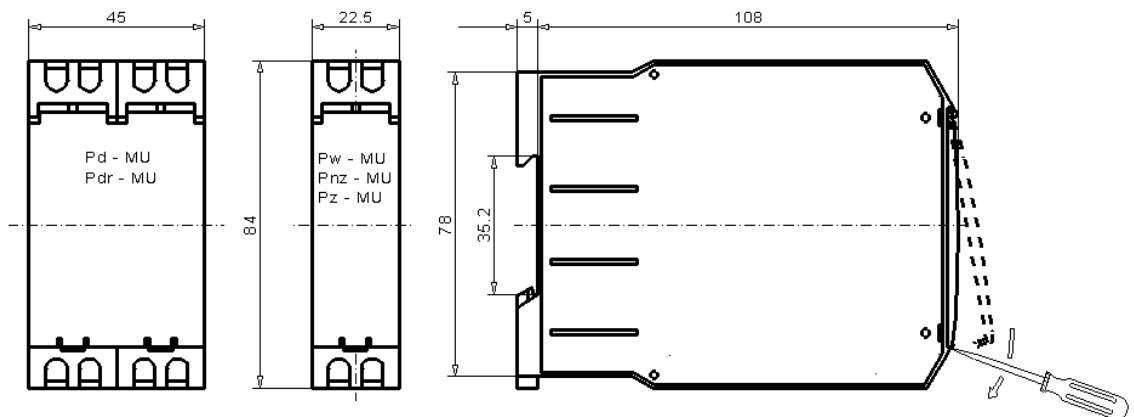
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Adjustment	After taking off the plexiglass cover it is possible to adjust with the potentiometer which is named "SPAN" the final value and with the potentiometer which is named "ZERO" the zero-point (zero point elevation only).	
Regulations	EMC	DIN EN 61326
	Mechanical strength	DIN EN 61010 part 1
	Electrical security	DIN EN 61010 part 1
		Housing all insulated, protection class II, at a working voltage up to 300V (network to neutral conductor) degree of pollution 2, overvoltage category CAT III at a working voltage up to 600V (network to neutral conductor) degree of pollution 2, overvoltage category CAT III
	Accuracy, overload	DIN EN 60688
	Separation	DIN EN 61010 part 1, 3,52 kV 50 Hz 10 sec. and 5,2 kV 50 Hz 10 sec.
	Air gaps and creep distances	DIN EN 61010 part 1
	System of protection	DIN EN 60529 housing IP30, terminals IP20
	Connection	DIN 43807
Auxiliary voltage (only in case of "live zero", fluctuating voltage or rated voltage > 500 V)	Option	230 V AC \pm 20 %, 45-65 Hz, 2,5 VA <ul style="list-style-type: none"> • 110 V AC \pm 20 %, 45-65 Hz, 2,5 VA • 24 V DC, -15 % bis +25 %, 2 W, (EMC DIN EN 61326 class A) • 6-30 V AC + DC or 36-265 V AC + DC, 2 VA, (EMC DIN EN 61326 class A)
Types	Pw-MU	Alternating current
	Pnz-MU	Three-wire three-phase current of same load
	Pz-MU	Four-wire three-phase current of same load
	Pd-MU	Three-wire three-phase current of any load
	Pdr-MU	Four-wire three-phase current of any load
Weight		Pw-MU, Pz-MU, Pnz-MU: 200 g Pd-MU: 340 g Pdr-MU: 370 g

Dimensions



Installation	Attachement	snap-on mounting according to DIN EN 50 022
	Electrical connection	threaded terminal end 4 mm ² max.

Warning! Before starting any work on or in a device, it must be disconnected from the mains or switched to a voltage-free state.

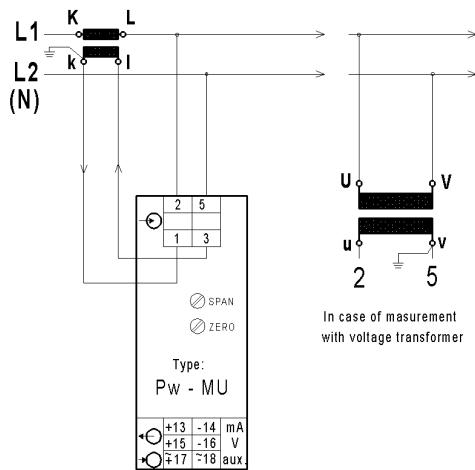
Maintenance The device is maintenance-free when used correctly.

Caution! Servicing or maintenance work must only be carried out by trained specialist personnel.

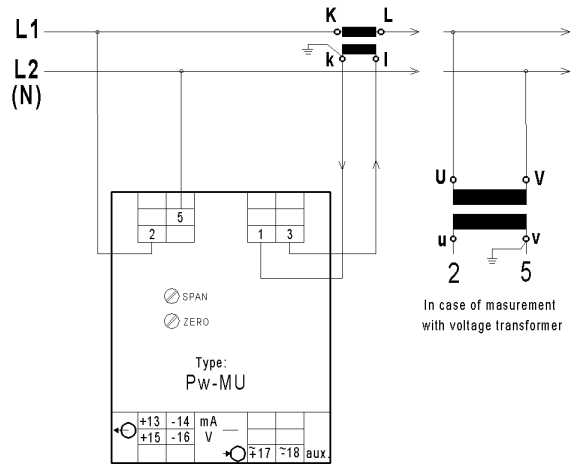


Connection

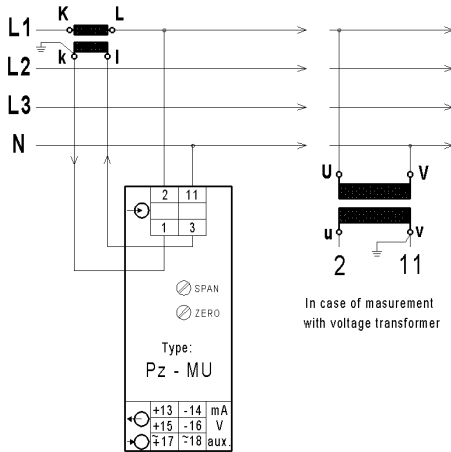
Type Pw-MU (alternating current)
working voltage up to 300V (phase to neutral L - N)



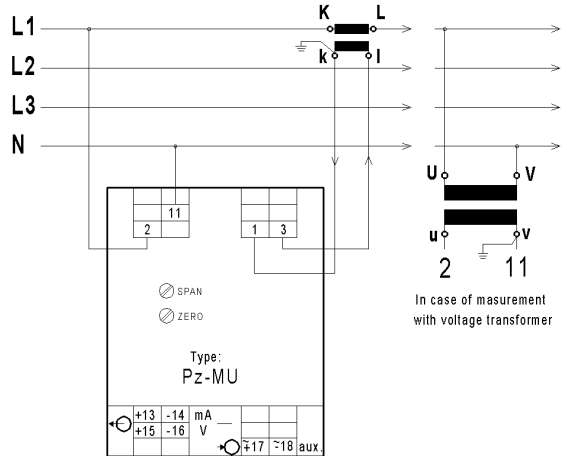
working voltage up to 600V (phase to neutral L - N)



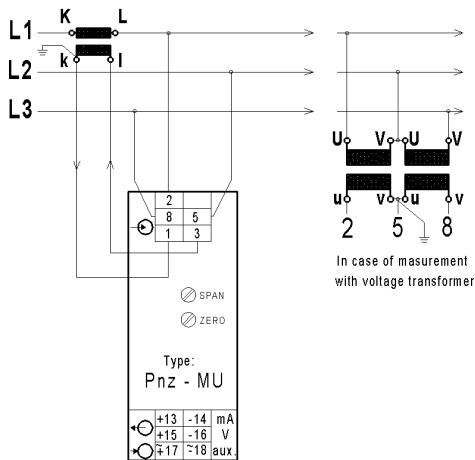
Type Pz-MU (Four-wire three-phase current of same load)
working voltage up to 300V (phase to neutral L - N)



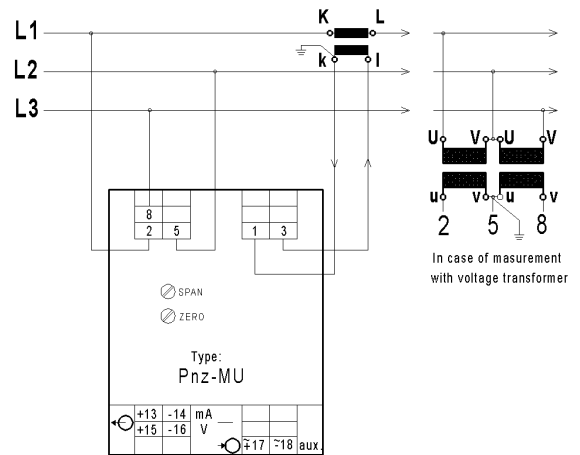
working voltage up to 600V (phase to neutral L - N)



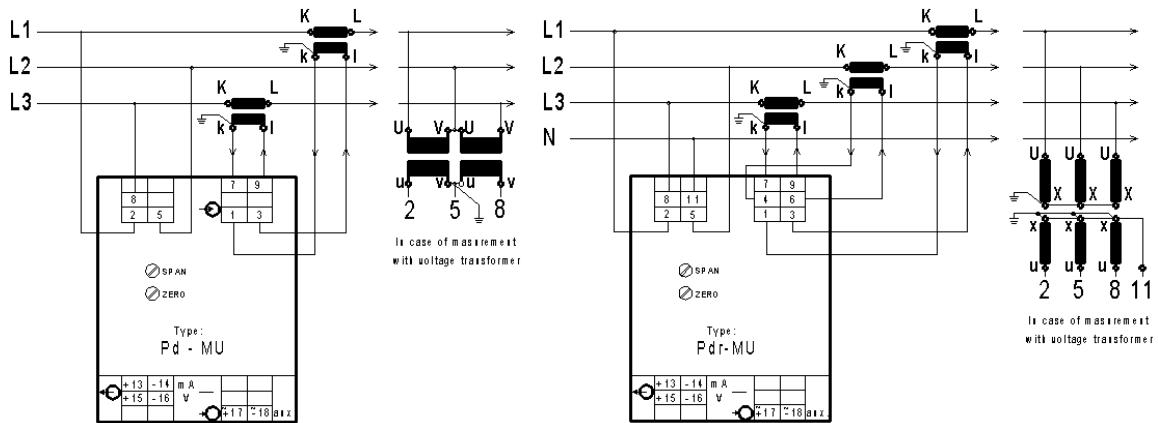
Type Pnz-MU (Three-wire three-phase current of same load)
working voltage up to 300V (phase to neutral L - N)



working voltage up to 600V (phase to neutral L - N)



Type Pdr-MU (Four-wire three-phase current of any load)



Transducers with frequency module have no further outputs.
 At the clamps +13 and -14 the frequency output is available.