



Measuring transducers for active power

Alternating current and 3-phase current

Type:

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



Application

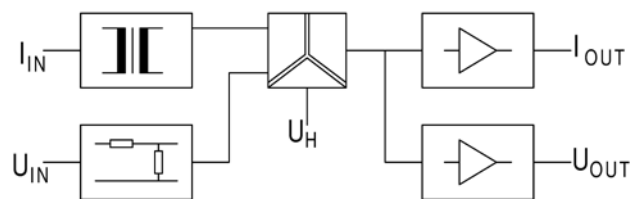
The measuring transducers Pw-MU, Pnz-MU, Pz-MU, Pd-MU and Pdr-MU are used for the transformation and isolation of the active power in alternating current or three-phase power systems into an impressed direct current and direct voltage signal.



Function

The parameters to be measured are transmitted to the analog multiplier via internal current transformers and voltage dividers. The instantaneous values of current and voltage are then multiplied and formed as the mean value of a direct voltage matching the active power in a downstream integration stage. Sinusoidal and non-sinusoidal alternating current parameters of any waveform may be measured. The galvanic isolation between input and output signals is done using optocoupler. A downstream amplifier supplies the impressed direct current and direct voltage signals. Both outputs are no-load proof and short-circuit proof. Connecting the two outputs is not permissible.

An auxiliary voltage is required for „live zero“ or rated voltage fluctuations $> \pm 20\%$.



Types and variants

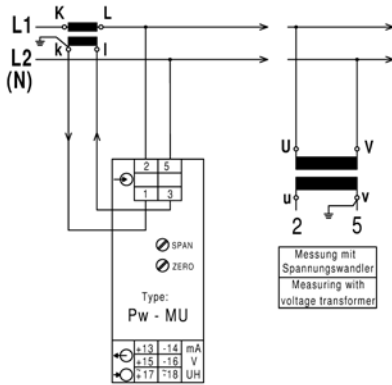
Input	50-150 % of the apparent power, 100 / 110 / 230 / 400 / 500 or 600 V 1 A or 5 A (please specify primary current!) Direct connection up to max. 10 A on request!
Output	<p>Pw-MU (alternating current system) or</p> <p>Pz-MU (4-wire 3-phase power system of same load) or</p> <p>Pnz-MU (3-wire 3-phase power system of same load): 0-20 mA and 0-10 V (without auxiliary voltage) 4-20 mA and 2-10 V (with auxiliary voltage)</p> <p>Pd-MU (3-wire 3-phase power system of any load): 0-20 mA and 0-10 V (without auxiliary voltage) 4-20 mA and 2-10 V (with auxiliary voltage)</p> <p>Pdr-MU (4-wire 3-phase power system of any load): 0-20 mA and 0-10 V (without auxiliary voltage) 4-20 mA and 2-10 V (with auxiliary voltage)</p>
Surcharges	<p>Bidirectional energy directions</p> <p>Auxiliary voltage required in case of rated voltage fluctuation $> \pm 20\%$ and voltages $> 500\text{ V}$</p> <p>230 V AC or 110 V AC</p> <p>24 V DC</p> <p>6-30 V AC + DC</p> <p>36-265 V AC + DC</p>
Frequency module	Type FM (frequency output 0-5 Hz up to 0-10 kHz) - (description page 10)
Relay module	for limit monitoring Type GWM - (description page 11)



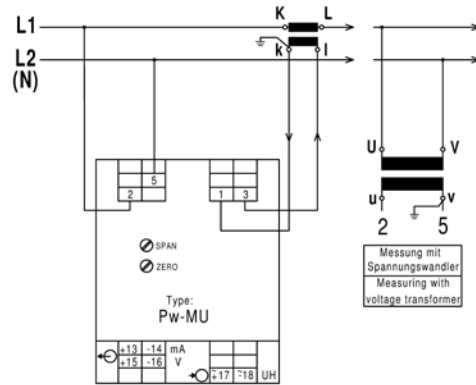
Connection

Type Pw-MU (Alternating current)

Working voltage up to 300 V (Phase to neutral L - N)

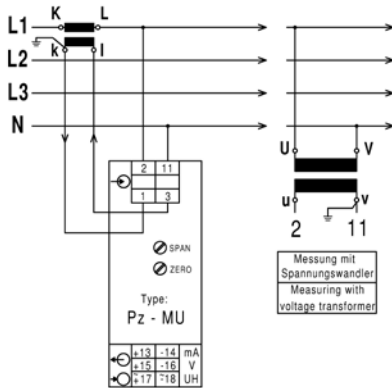


Working voltage up to 600 V (Phase to neutral L - N)

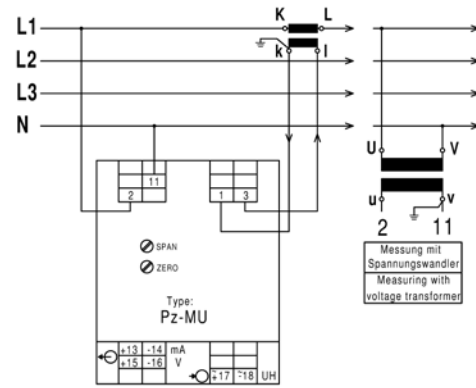


Type Pz-MU (4-wire 3-phase current same load)

Working voltage up to 300 V (Phase to neutral L - N)

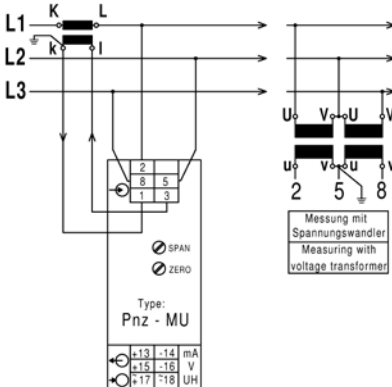


Working voltage up to 600 V (Phase to neutral L - N)

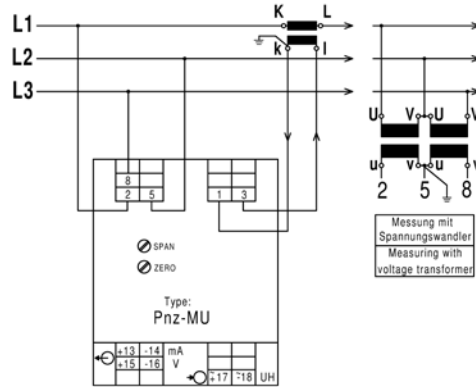


Type Pnz-MU (3-wire 3-phase current same load)

Working voltage up to 300 V (Phase to neutral L - N)

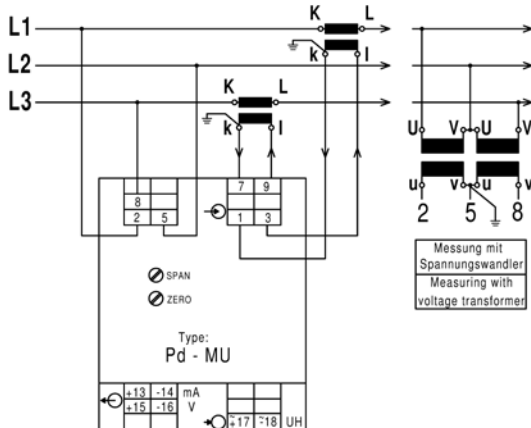


Working voltage up to 600 V (Phase to neutral L - N)

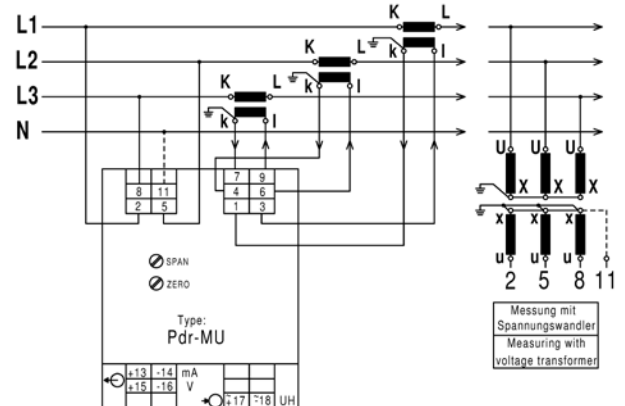


Type Pd-MU (3wire 3-phase current any load)

Working voltage up to 600 V (Phase to neutral L - N)



Type Pdr-MU (4-wire 3-phase current any load)





Technical data

Input	Input variables	active power for alternating and 3-phase current
	Rated values	50-150 % of apparent power with alternating current: $S = U \times I$ with 3-phase current: $S = U \times I \times 1,732$
	Rated voltage	100 V, 110 V, 230 V, 400 V, 500 V or 600 V $\pm 20 \%$, 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
	High surge load	current: 20-fold, 1 s voltage: 2-fold, 1 s
	Output	Output variables
Rated values		0-20 mA / 500 Ω load and 0-10 V / max. load 10 mA
Option		● „live zero“ 4-20 mA / 500 Ω load and 2-10 V max. load 10 mA (auxiliary voltage required)
Bipolar output		● e.g. - 20 - 0 - + 20 mA / 500 Ω load and - 10 - 0 - + 10 V / max. load 10 mA
Zero point rise		● e.g. 0-10-20 mA / 500 Ω load and 0-5-10 V / max. load 10 mA
Transfer behavior	Accuracy	$\pm 0,5 \%$
	Voltage influence	$< 0,1 \%$ with $\pm 10 \%$ of rated voltage
	Frequency influence	$< 0,3 \%$ with 10 Hz frequency change
	Phase angle influence	$< 0,5 \%$ for $\pm 90^\circ$
	Temperature range	-15 $^\circ\text{C}$ to <u>+20 $^\circ\text{C}$</u> to +30 $^\circ\text{C}$ to +55 $^\circ\text{C}$
	Temperature influence	$< 0,3 \%$ at 10 K
	Auxiliary voltage influence	no
	Load influence	no
	External magnetic field influence	no (400 A/m)
	Residual ripple	$< 30 \text{ mVss}$
	Response time	$< 300 \text{ ms}$
	Open circuit voltage	max. 24 V
	Current limiting	max. 2-fold in case of overload
	Test voltage	$< 500 \text{ V}$: 4 kV between input, output, auxiliary voltage $> 500 \text{ V}$: 5,2 kV between input and output 4 kV between input / output and auxiliary voltage
Auxiliary voltage (with „live zero“ or in case of rated voltage fluctuation or voltages $> 500 \text{ V}$)		230 V AC $\pm 20 \%$, 45-65 Hz, 2,5 VA
	Options	● 110 V AC $\pm 20 \%$, 45-65 Hz, 2,5 VA ● 24 V DC - 15 % to + 25 %, 2 W ● 6-30 V AC + DC, 2 VA ● 36-265 V AC + DC, 2 VA
Dimensions	$< 500 \text{ V}$: Pw-MU, Pz-MU, Pnz-MU:	Housing A, (22,5 mm wide) Page A1
	$> 500 \text{ V}$: Pw-MU, Pz-MU, Pnz-MU:	Housing B, (45 mm wide) Page A1
	Pd-MU, Pdr-MU:	Housing B, (45 mm wide) Page A1
Weight	Pw-MU, Pz-MU, Pnz-MU:	250 g
	Pd-MU:	340 g
	Pdr-MU:	370 g
Installation	Fastening	Snap-on fastening on top hat rail 35 mm acc. to DIN EN 60 715
	Electrical connection	Screw terminal max. 4 mm ²