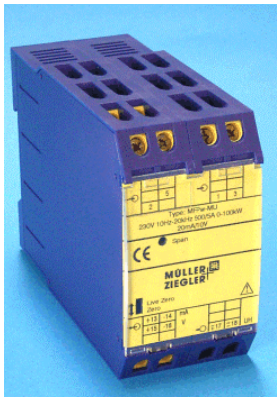


MEASURING TRANSDUCERS FOR ACTIVE POWER AT MEDIUM FREQUENCIES

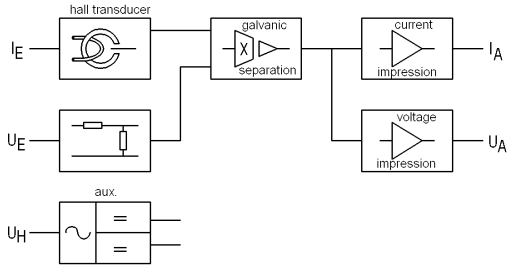
MFPw-MU, MFPz-MU, MFPnz-MU, MFPd-MU, MFPdr-MU

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 MFPw-MU, MFPnz-MU, MFPz-MU, MFPd-MU and MFPdr-MU measuring transducers are used to convert and isolate active power in the direct voltage and medium frequency range into an direct current and direct voltage injection signal. They can be used in plant with variable-speed AC drives as well as on frequency inverters, DC drives with current converters, welding systems, induction furnaces, etc.

Function The values to be measured are sent to the analogue multiplier via current converters and voltage dividers. The multiplier multiplies the instantaneous current and voltage values before they undergo mean value generation to create a direct voltage corresponding to the active power. Optocouplers are used to isolate the input signals from the output signals. The downstream amplifiers supply the direct current and direct voltage injection signals. Both outputs are idling-proof and short-circuit-proof. A connection must not be made between them. An auxiliary voltage is not required.



Technical data

Input	Input value	Active power for alternating or direct current, identical or non-identical load, energy flow in one or both directions
	Rated power	**50 – 150%** of apparent power at alternating current P_S = U x I, at direct current P_S = U x I x1.732
	Rated voltage	**0-100 V, 110 V, 230 V, 400 V, 500 V or 600 V** (690 V in earthed systems) max. 0.3 VA
	Rated current	A value of **0-2 A to 0-25 A** for direct measurement, higher current values via indirect measurement using an external current converter (Hall effect or flexible current converter)
	Rated frequency	**1000 Hz**, frequency range 10 Hz – 20 kHz/DC
	Continuous overload	Voltage 1.2x, current 2x (max. 25 A)
	Impulse overload	Voltage 2x 1 second, current 20x 1 seconds
Output	Output value	Injected direct current and injected direct voltage, with simultaneous use of both outputs the voltage output load must not exceed 1 mA.
	Double output	**0-20 mA**/0-500 Ohm load impedance and **0-10 V** max. 10mA load permissible **"live zero" 4-20mA**/0-500 Ohm load impedance and **2-10V** max. 10mA load permissible, can be selected using switch on front panel
	Options	• **Bipolar output** e.g. **–20 – 0 - +20 mA**/500 Ohm load impedance and **–10 – 0 - +10V** max. 10 mA load permissible • **Zero elevation** e.g. **0 – 10 – 20 mA**/500 Ohm load impedance and **0 – 5 – 10V** max. 10 mA load permissible • **Frequency module** one value of **0 – 5 Hz** to **0 – 10 kHz** ○ "Open collector" NPN, max. 30 V 100 mA load permissible, pulse/break 50/50% ○ Square wave signal 5 V, max. 10 mA load permissible, pulse/break 50/50%

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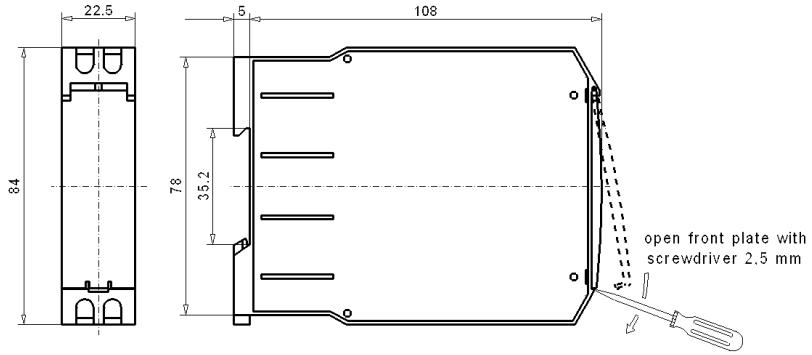
Dynamic system behaviour	Accuracy	+/- 0.5%
	Voltage influence	< 0.5% within rated voltage
	Frequency influence	< 3% in frequency range 10 Hz to 20 kHz or on DC
	Phase angle influence	< 0.5% at +/- 90° at 1000 Hz
	Temperature range	-15 to +20 to +30 to +55°C
	Temperature influence	< 0.3% at 10 K
	Influence of aux.	none
	Load effect	none
	External magnetic field influence	none (up to 400 A/m)
	Residual ripple	< 40 mV_{ss}
	Response time	< 1 s
	No-load voltage	max. 24 V
	Testing voltage	4 kW between all inputs and outputs and to aux. voltage
Adjustment	Remove the transparent cover and use a 2.5 mm screwdriver to set the limit value on the potentiometer labelled "SPAN" and to adjust the zero point on the potentiometer labelled "ZERO" (zero point elevation only).	
Regulations	EMC	DIN EN 61326
	Mechanical strength	DIN EN 61010 Part 1
	Electrical security	DIN EN 61010 Part 1 Totally insulated housing, protection class II, At working voltages up to 300 V (mains with neutral conductor) pollution degree 2, meas. category CAT III At working voltages up to 600 V (mains with neutral conductor) pollution degree 2, meas. category CAT II
	Accuracy, overload	DIN EN 60688
	Separation	DIN EN 61010 Part 1, 3.52 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		230 V AC ± 20%, 45-65 Hz, 3.5 VA
Weight	MFP..-MU	300 g
	MFPd-MU	340 g
	MFPr-MU	360 g

Dimensions



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.**

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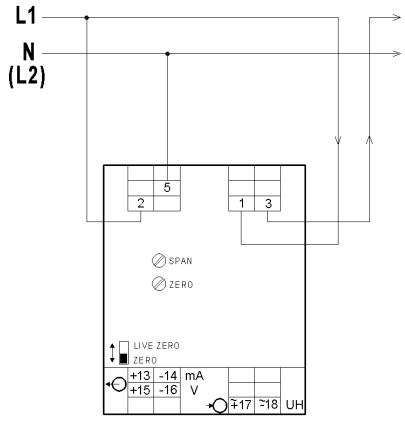
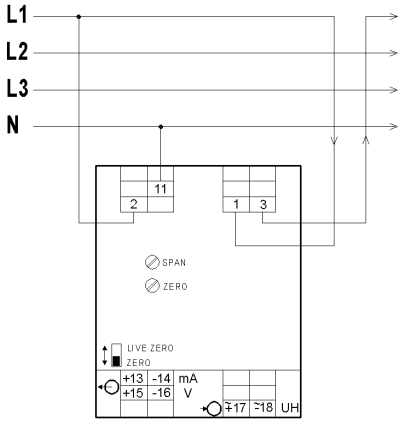
Connection

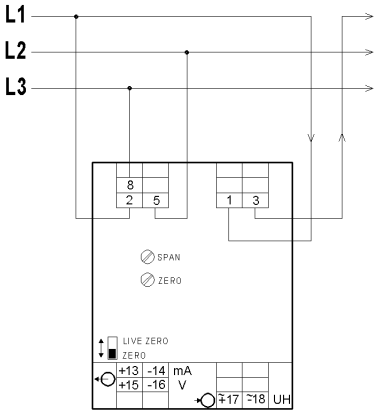
Type MFPw-MU (alternating current)



Type MFPz-MU (three-phase four wire identical load)

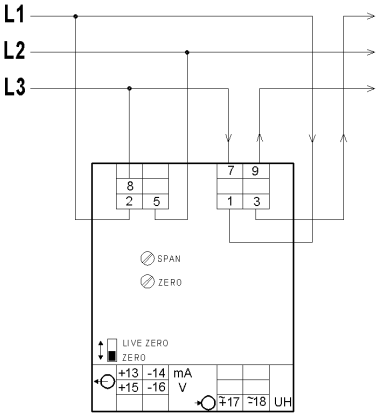


Type MFPnz-MU (three-phase three-wire identical load)

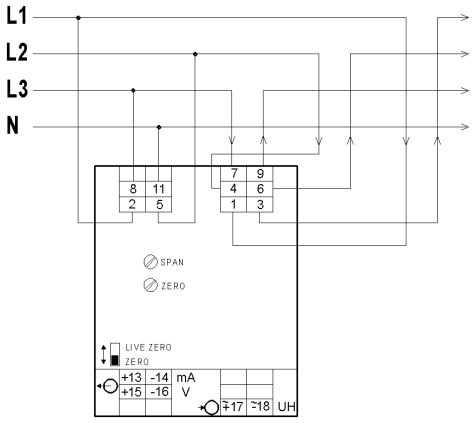


On devices with a frequency module, there are no other outputs. The frequency output is available at terminals +13 and -14.

Type MFPd-MU (three-phase three-wire identical load)



Type MFPdr-MU (three-phase four-wire non-identical load)



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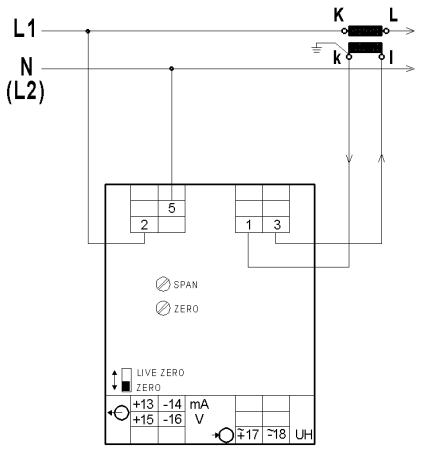
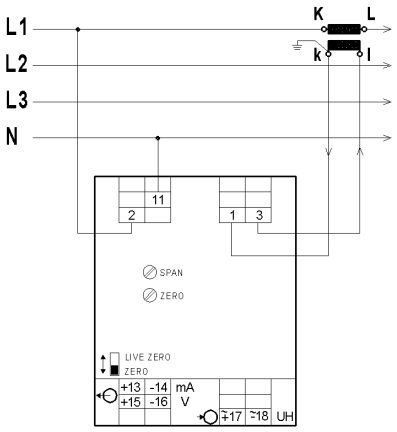
Connection with current transformer

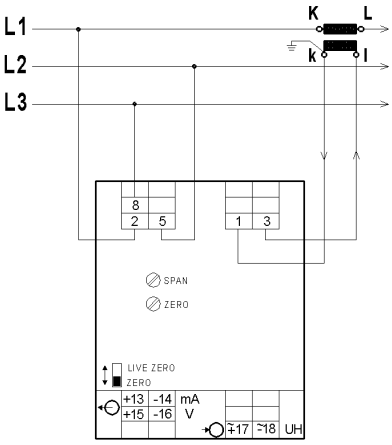
Type MFPw-MU (alternating current)



Type MFPz-MU (three-phase four wire identical load)

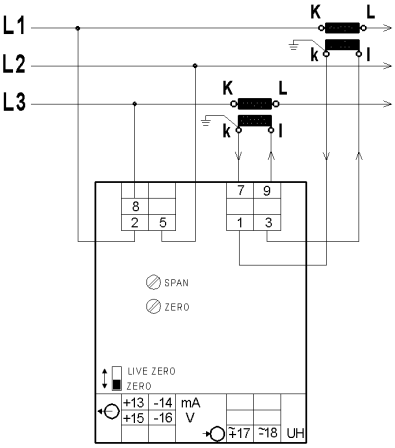


Type MFPnz-MU (three-phase three-wire identical load)

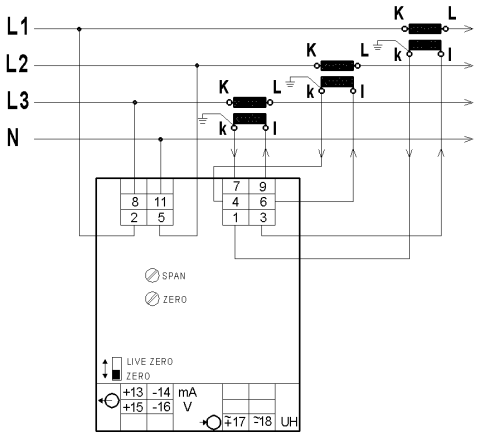


On devices with a frequency module, there are no other outputs. The frequency output is available at terminals +13 and -14.

Type MFPd-MU (three-phase three-wire identical load)



Type MFPdr-MU (three-phase four-wire non-identical load)



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