# **Measuring Transducers**



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NT-G.1

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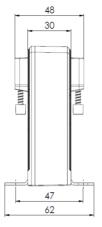
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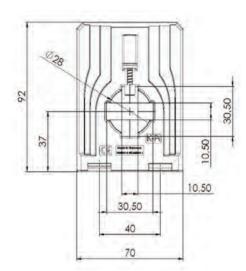
### **CCT 31.3 RMS** (Compensation current transformer, MBS All current sensors) Current transformers for the measurement of direct and alternating currents

- For measuring of non-sinusoidal and distorted networks
- As a measuring transducer for the direct input wiring of SPS input cards



Transformer height: 92 mm Transformer depth: 48 mm





Additiona	l accessories:
Snap-on mo	unting to clip onto
35 mm DIN ra	ail (Artno. 53011)

Dimensions:	Applicable technical standards:	Electric connections:
Bus bar: 30x10 mm	DIN EN 50178, 1997	U <sub>H</sub> + 0 (Ground) I <sub>A</sub>
Round conductor: 28 mm	DIN EN 61010-1, 2002	Spring clamp terminal
Transformer width: 70 mm	VDE 0160	Connection cross sections: 0.082.5 mm <sup>2</sup>

Technical data:	
Measuring range:	0300 A DC / 0300 A I <sub>RMS</sub> AC, depends on varieties! (Nominal current ranges adjusted to standard values according to IEC)
Frequency range:	DC, or AC 20 Hz 6 kHz, Peak value factor ≤ 4
Current output:	420 mA DC, RMS measurement
Max. burden resistance at current output:	$R_B \le 500 \ \Omega \ (U_H = 24 \ V \ DC)$
Current limit under overload:	< 25 mA
Accuracy:	± 1,0 %
Max. operating voltage U <sub>m</sub> :	0,72 kV, U <sub>eff</sub>
Isolation test voltage:	6,4 kV, U <sub>eff</sub> , 50 Hz, 5 sec., primary conductor against measuring output / housing
Auxiliary voltage:	24 V ± 15 % DC, < 70 mA, external protection via microfuse 250 mA / 250 V, fast!
Step response time (90 % $I_{PN}$ , di/dt = 100 A / $\mu$ s):	≤ 200 ms (typ. 150 ms)
Signal rise speed di/dt:	< 100 A / µs
Isolation class	E
Protection class	IP 20
Operating altitude	≤ 2000 m (DIN EN 61010-1)
Max. temperature of the primary conductor:	100° C
Operating temperature:	-25° C < T <sub>U</sub> < +60° C, 095% rH, without condensation
Storage temperature:	-40° C < T <sub>L</sub> < +90° C

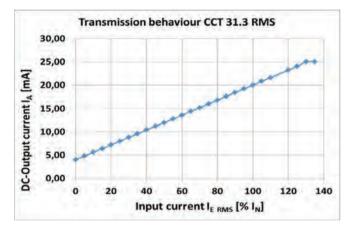
### Functions of the CCT 31.3 RMS:

- Electricity is conducted over the magnetic field and is captured by the measuring core. The current induced in the measuring core is proportional to the magnetic flow and is captured by a semi-conductor element. An integrated electronic control unit converts the semi-control signal into a true effective value of the measuring size in proportion to the DC output current signal. The true effective value is calculated by the delta-sigma-method.
- A contactless inductive captured parameter creates a galvanically separated output signal.
- Electrical contact with the secondary circuit of the current transformer is achieved by means of a 4-pole spring-clamp. This clamp is suitable for connection to a flexible conductor up to 2.5 mm<sup>2</sup>.
- A DC auxiliary voltage of 24 V is required to supply the electronic controls. The auxiliary voltage input must be secured by a HRC fuse size of 250 mA / 250 V/F.

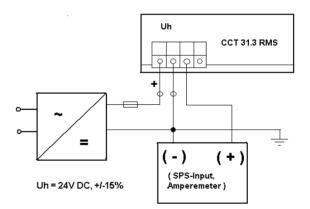
### Advantages and benefits of the CCT 31.3 RMS:

- Measuring of direct current as well as alternating current with only one current transformer is possible.
- Exact calculation of the true effective value of any temporal process of the current which is to be measured.
- Large working frequency range from 0 Hz (DC) or 20 Hz...6 kHz (AC).
- High electric protection of the galvanically isolated capture of the measured variable.
- Low power-consumption (≤ 2.5 VA)
- Easy and safety electrical connection by means of spring clamp terminal.
- Direct mounting onto the bus bar by means of integrated fixing screws which are part of the unit.
- Mounting onto 35 mm DIN-rail by means of optional supply of snap-on mounting.
- High climatic and mechanical durability, PU-resin hardened enclosures of all electrical components.

### Transfer ratio of the CCT 31.3 RMS:



Wiring Diagram of the CCT 31.3 RMS:



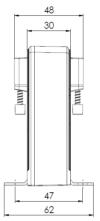
### **Order list:**

Туре	Primary current I <sub>RMS</sub> [A]	Artno.	Current output
	50	1103-10001	
	100	1103-10003	
	150	1103-10005	420 mA DC
CCT 31.3 RMS	200	1103-10006	
	250	1103-10007	
	300	1103-10008	

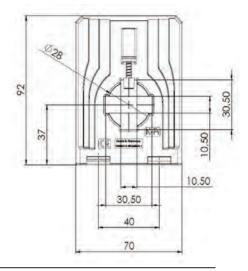
### **CCT 31.3 I** (Compensation current transformer, MBS All current sensors) Current transformers for the measurement of direct and alternating currents

- For network analysis, monitoring,
- and measuring of non-sinusoidal and distorted networks





Additional accessories: Snap-on mounting to clip onto 35 mm DIN rail (Art.-no. 53011)



### Dimensions:

Bus bar: 30x10 mm Round conductor: 28 mm Transformer width: 70 mm Transformer height: 92 mm Transformer depth: 48 mm

### Applicable technical standards: DIN EN 50178, 1997 DIN EN 61010-1, 2002 VDE 0160

### Electric connections:

U<sub>H</sub> + 0 (Ground) I<sub>A</sub> Spring clamp terminal Connection cross sections: 0.08...2.5 mm<sup>2</sup>

#### **Technical data:** 0...300 A DC / AC Ieff, depends on varieties! Measuring range: (Nominal current ranges adjusted to standard values according to IEC) Frequency range: 0...100 kHz, any signal curves Current output at AC-input signal: AC: 0...20 mA I<sub>eff</sub>, (± 28.2843 mA I<sub>Peak</sub>) DC: 0...± 20 mA Current output at DC-input signal: $R_B \leq 200 \ \Omega \ (U_H = 24 \ V \ DC)$ Max. burden resistance at current output: Current limit under overload: < 25 mA Accuracy: ± 0,5 % Max. operating voltage U<sub>m</sub>: 0,72 kV, U<sub>eff</sub> 6,4 kV, Ueff, 50 Hz, 5 sec., primary conductor against Isolation test voltage: measuring output / housing ± 12 V DC, ± 15% < 70 mA, external protection via Auxiliary voltage: microfuse 100 mA / 250 V, fast! Energia response time (90 % $I_{PN}$ , di/dt = 100 A / $\mu$ s): ≤ 1 µs (typ. 150 ns) Signal rise velocity di/dt: < 100 A / µs Isolation class Е Protection class IP 20 ≤ 2000 m (DIN EN 61010-1) Operating altitude Max. temperature of the primary conductor: 100° C -25° C < $T_U$ < +60° C, 0...95% rH, without condensation Operating temperature: Storage temperature: $-40^{\circ} \text{ C} < \text{T}_{\text{L}} < +90^{\circ} \text{ C}$

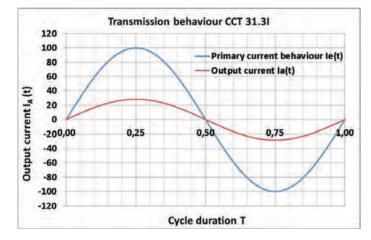
### Functions of the CCT 31.3 I:

- Electricity is conducted over the magnetic field and is captured by the measuring core. The current induced in the measuring core is proportional to the primary current and is captured by a semi-conductor element. An integrated electronic control unit converts the semi-control signal into an output current signal, which is directly proportional to the temporal course of the measured primary value.
- A contactless inductive captured parameter creates a galvanically separated output signal.
- Electrical contact with the secondary circuit of the current transformer is achieved by means of a 4-polespring-clamp. This clamp is suitable for connection to a flexible conductor up to 2.5 mm<sup>2</sup>.
- A DC auxiliary voltage of ± 12 V is required to supply the electronic controls. The auxiliary voltage input
  must be secured by a HRC fuse size of 100 mA / 250 V microfuse.

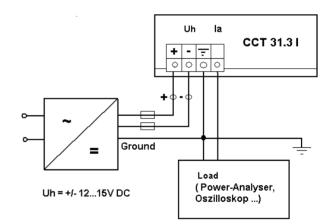
### Advantages and benefits of the CCT 31.3 I:

- Measuring of direct current as well as alternating current with only one current transformer is possible.
- Large working frequency range from 0 Hz (DC)...100 kHz (AC).
- High electric protection of the galvanically isolated capture of the measured variable.
- Low power-consumption (≤ 2.5 VA)
- Easy and safety electrical connection by means of spring clamp terminal.
- Direct mounting onto the bus bar by means of integrated fixing screws which are part of the unit.
- Mounting onto 35 mm DIN-rail by means of optional supply of snap-on mounting.
- High climatic and mechanical durability, PU-resin hardened enclosures of all electrical components.

### Transfer ratio of the CCT 31.3 I:



### Wiring Diagram of the CCT 31.3 I:



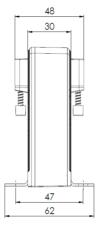
### Order list:

Туре	Primary current [A] DC / AC (I <sub>eff</sub> )	Artno.	Current output
	50	1101-10001	
CCT 31.3 I	100	1101-10003	
	150	1101-10005	DC: 0± 20mA
	200	1101-10006	AC: 020 mA I <sub>eff</sub>
	250	1101-10007	AC. 020 IIIA I <sub>eff</sub>
	300	1101-10008	

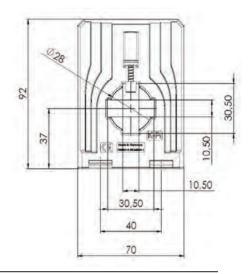
### CCT 31.3 U (Compensation current transformer, MBS All current sensors) Current transformers for the measurement of direct and alternating currents

- For network analysis, monitoring,
- and measuring of non-sinusoidal and distorted networks





Additional accessories: Snap-on mounting to clip onto 35 mm DIN rail (Art.-no. 53011)



### **Dimensions:**

Bus bar: 30x10 mm Round conductor: 28 mm Transformer width: 70 mm Transformer height: 92 mm Transformer depth: 48 mm

Applicable technical standards: DIN EN 50178, 1997 DIN EN 61010-1, 2002 **VDE 0160** 

### **Electric connections:** U<sub>H</sub> + 0 (Ground) $I_{\mathsf{A}}$

Spring clamp terminal Connection cross sections: 0.08...2.5 mm<sup>2</sup>

### **Technical data:**

	0300 A DC / AC I <sub>eff</sub> , depends on varieties!
Measuring range:	(Nominal current ranges adjusted to standard values
	according to IEC)
Frequency range:	0100 kHz, any signal curves
Voltage output, AC Input:	2,5 ± 1 V, U <sub>eff</sub> , AC; 2,5 ± 1,414 V (Peak-Peak)
Voltage output, DC Input:	2.5 ± 1 V, DC
Min. burden resistance at current output:	R <sub>B</sub> ≥ 100 kΩ
Current limit under overload:	< 5 V
Accuracy:	± 0,5 %
Max. operating voltage U <sub>m</sub> :	0,72 kV, U <sub>eff</sub>
Isolation test voltage:	6,4 kV, U <sub>eff</sub> , 50 Hz, 5 sec., primary conductor against
isolation test voltage.	measuring output / housing
Auxiliary voltage:	± 12 V DC, ± 15% < 70 mA, external protection via
Auxiliary voltage.	microfuse 100 mA / 250 V, fast!
Energia response time (90 % I <sub>PN</sub> , di/dt = 100 A / µs):	≤ 1 μs (typ. 150 ns)
Signal rise velocity di/dt:	< 100 A / µs
Isolation class	E
Protection class	IP 20
Operating altitude	≤ 2000 m (DIN EN 61010-1)
Max. temperature of the primary conductor:	100° C
Operating temperature:	-25° C < T <sub>U</sub> < +60° C, 095% rH, without condensation
Storage temperature:	-40° C < T <sub>L</sub> < +90° C

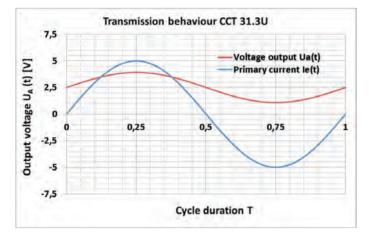
### Functions of the CCT 31.3 U:

- Electricity is conducted over the magnetic field and is captured by the measuring core. The current induced in the measuring core is proportional to the primary current and is captured by a semi-conductor element. An integrated electronic control unit converts the semi-control signal into an output voltage signal, which is directly proportional to the temporal course of the measured primary value.
- A contactless inductive captured parameter creates a galvanically separated output signal.
- Electrical contact with the secondary circuit of the current transformer is achieved by means of a 4-polespring-clamp. This clamp is suitable for connection to a flexible conductor up to 2.5 mm<sup>2</sup>.
- A DC auxiliary voltage of ± 12 V is required to supply the electronic controls. The auxiliary voltage input must be secured by a HRC fuse size of 100 mA / 250 V microfuse.

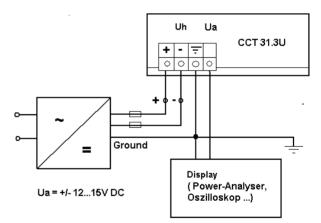
### Advantages and benefits of the CCT 31.3 U:

- Measuring of direct current as well as alternating current with only one current transformer is possible.
- Large working frequency range from 0 Hz (DC)...100 kHz (AC).
- High electric protection of the galvanically isolated capture of the measured variable.
- Low power-consumption (≤ 2.5 VA)
- Easy and safety electrical connection by means of spring clamp terminal.
- Direct mounting onto the bus bar by means of integrated fixing screws which are part of the unit.
- Mounting onto 35 mm DIN-rail by means of optional supply of snap-on mounting.
- High climatic and mechanical durability, PU-resin hardened enclosures of all electrical components.

### Transfer ratio of the CCT 31.3 U:



Wiring Diagram of the CCT 31.3 U:

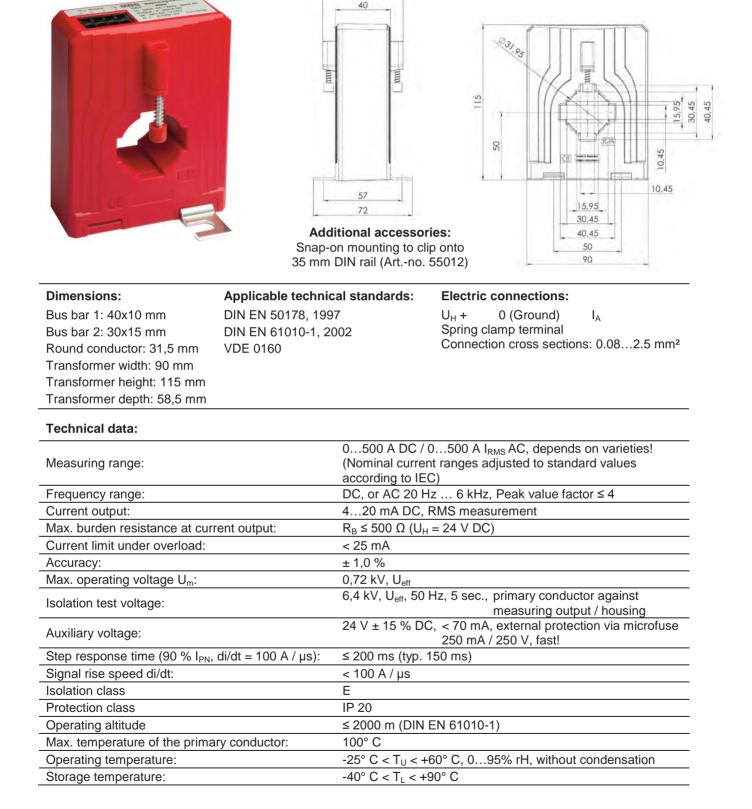


### Order list:

Туре	Primary current I <sub>eff</sub> [A] DC / AC (I <sub>eff</sub> )	Artno.	Voltage output
	50	1102-10001	
	100	1102-10003	DC: 2.5 ± 1V
CCT 21 2 11	150	1102-10005	
CCT 31.3 U	200	1102-10006	AC: 2,5 ± 1,414 V
	250	1102-10007	(Peak-Peak)
	300	1102-10008	

### **CCT 41.4 RMS** (Compensation current transformer, MBS All current sensors) Current transformers for the measurement of direct and alternating currents

- For measuring of non-sinusoidal and distorted networks
- As a measuring transducer for the direct input wiring of SPS input cards



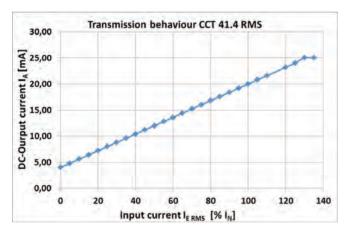
### Functions of the CCT 41.4 RMS:

- Electricity is conducted over the magnetic field and is captured by the measuring core. The current induced in the measuring core is proportional to the magnetic flow and is captured by a semi-conductor element. An integrated electronic control unit converts the semi-control signal into a true effective value of the measuring size in proportion to the DC output current signal. The true effective value is calculated by the delta-sigma-method.
- A contactless inductive captured parameter creates a galvanically separated output signal.
- Electrical contact with the secondary circuit of the current transformer is achieved by means of a 4-pole spring-clamp. This clamp is suitable for connection to a flexible conductor up to 2.5 mm<sup>2</sup>.
- A DC auxiliary voltage of 24 V is required to supply the electronic controls. The auxiliary voltage input must be secured by a HRC fuse size of 250 mA / 250 V/F.

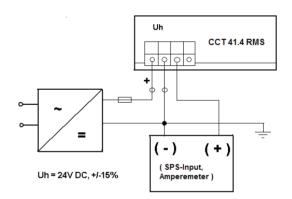
### Advantages and benefits of the CCT 41.4 RMS:

- Measuring of direct current as well as alternating current with only one current transformer is possible.
- Exact calculation of the true effective value of any temporal process of the current which is to be measured.
- Large working frequency range from 0 Hz (DC) or 20 Hz...6 kHz (AC).
- High electric protection of the galvanically isolated capture of the measured variable.
- Low power-consumption ( $\leq 2.5$  VA)
- Easy and safety electrical connection by means of spring clamp terminal.
- Direct mounting onto the bus bar by means of integrated fixing screws which are part of the unit.
- Mounting onto 35 mm DIN-rail by means of optional supply of snap-on mounting.
- High climatic and mechanical durability, PU-resin hardened enclosures of all electrical components.

### Transfer ratio of the CCT 41.4 RMS:



### Wiring Diagram of the CCT 41.4 RMS:

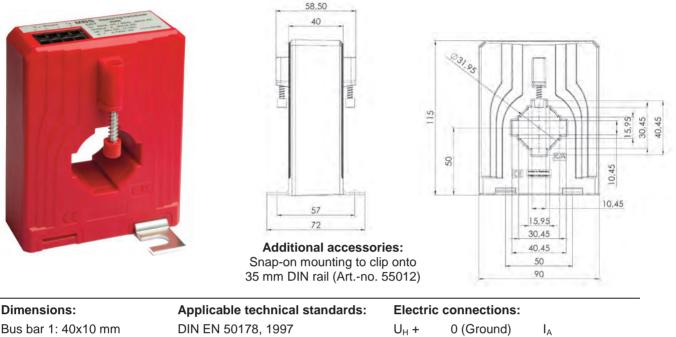


### Order list:

Туре	Primary current I <sub>RMS</sub> [A]	Artno.	Current output
	150	1203-10005	
	200	1203-10006	
	250	1203-10007	420 mA DC
CCT 41.4 RMS	300	1203-10008	420 IIIA DC
	400	1203-10009	
	500	1203-10010	

### **CCT 41.4 I** (Compensation current transformer, MBS All current sensors) Current transformers for the measurement of direct and alternating currents

- For network analysis, monitoring,
- and measuring of non-sinusoidal and distorted networks



Bus bar 1: 40x10 mm Bus bar 2: 30x15 mm Round conductor: 31.5 mm Transformer width: 90 mm Transformer height: 115 mm Transformer depth: 58,5 mm DIN EN 61010-1, 2002 VDE 0160

Spring clamp terminal Connection cross sections: 0.08...2.5 mm<sup>2</sup>

#### **Technical data:** 0...500 A DC / AC I<sub>eff</sub>, depends on varieties! (Nominal current Measuring range: ranges adjusted to standard values according to IEC) Frequency range: 0...100 kHz, any signal curves Current output at AC-input signal: AC: 0...20 mA I<sub>eff</sub>, (± 28.2843 mA I<sub>Peak</sub>) Current output at DC-input signal: DC: 0...± 20 mA Max. burden resistance at current output: $R_{B} \le 200 \ \Omega \ (U_{H} = 24 \ V \ DC)$ Current limit under overload: < 25 mA ± 0,5 % Accuracy: Max. operating voltage U<sub>m</sub>: 0,72 kV, U<sub>eff</sub> 6,4 kV, Ueff, 50 Hz, 5 sec., primary conductor against Isolation test voltage: measuring output / housing ± 12 V DC, ± 15% < 70 mA, external protection via Auxiliary voltage: microfuse 100 mA / 250 V, fast! Energia response time (90 % $I_{PN}$ , di/dt = 100 A / $\mu$ s): ≤ 1 µs (typ. 150 ns) Signal rise velocity di/dt: < 100 A / µs Isolation class Е Protection class IP 20 ≤ 2000 m (DIN EN 61010-1) Operating altitude Max. temperature of the primary conductor: 100° C -25° C $\overline{< T_U < +60^\circ C}$ , 0...95% rH, without condensation Operating temperature: Storage temperature: -40° C < T<sub>L</sub> < +90° C

### Functions of the CCT 41.4 I:

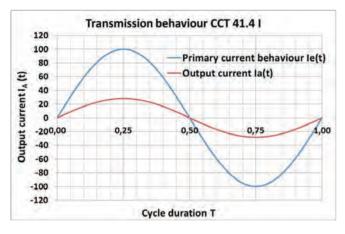
- Electricity is conducted over the magnetic field and is captured by the measuring core. The current induced in the measuring core is proportional to the primary current and is captured by a semi-conductor element. An integrated electronic control unit converts the semi-control signal into an output current signal, which is directly proportional to the temporal course of the measured primary value.
- A contactless inductive captured parameter creates a galvanically separated output signal.
- Electrical contact with the secondary circuit of the current transformer is achieved by means of a 4-polespring-clamp. This clamp is suitable for connection to a flexible conductor up to 2.5 mm<sup>2</sup>.
- A DC auxiliary voltage of ± 12 V is required to supply the electronic controls. The auxiliary voltage input must be secured by a HRC fuse size of 100 mA / 250 V microfuse.

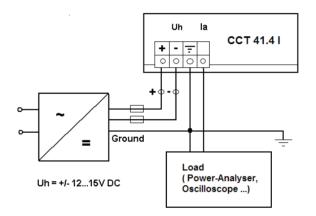
### Advantages and benefits of the CCT 41.4 I:

- Measuring of direct current as well as alternating current with only one current transformer is possible.
- Large working frequency range from 0 Hz (DC)...100 kHz (AC).
- High electric protection of the galvanically isolated capture of the measured variable.
- Low power-consumption ( $\leq 2.5$  VA)
- Easy and safety electrical connection by means of spring clamp terminal.
- Direct mounting onto the bus bar by means of integrated fixing screws which are part of the unit.
- Mounting onto 35 mm DIN-rail by means of optional supply of snap-on mounting.
- High climatic and mechanical durability, PU-resin hardened enclosures of all electrical components.

### Transfer ratio of the CCT 41.4 I:

### Wiring Diagram of the CCT 41.4 I:



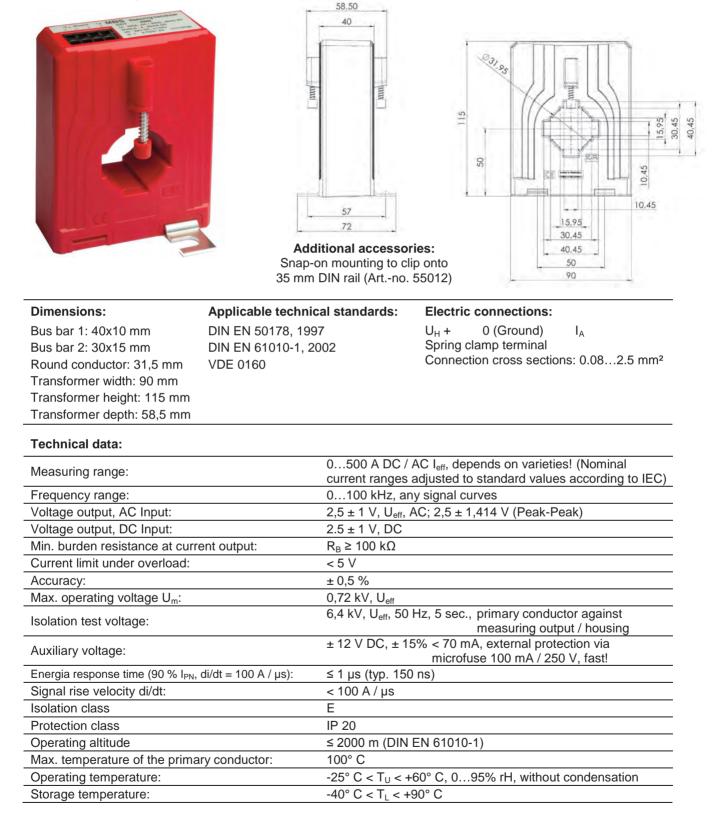


### **Order list:**

Туре	Primary current [A] DC / AC (I <sub>eff</sub> )	Artno.	Current output
	150	1201-10005	
	200	1201-10006	DC: 0± 20mA
CCT 41.4 I	250	1201-10007	DC. 0± 2011A
	300	1201-10008	AC: 0…20 mA I <sub>eff</sub>
	400	1201-10009	
	500	1201-10010	

### **CCT 41.4 U** (Compensation current transformer, MBS All current sensors) Current transformers for the measurement of direct and alternating currents

- For network analysis, monitoring,
- and measuring of non-sinusoidal and distorted networks



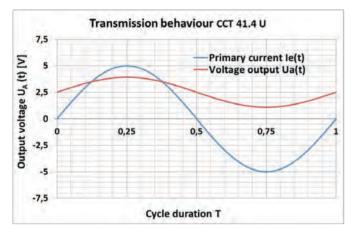
### Functions of the CCT 41.4 U:

- Electricity is conducted over the magnetic field and is captured by the measuring core. The current induced in the measuring core is proportional to the primary current and is captured by a semi-conductor element. An integrated electronic control unit converts the semi-control signal into an output voltage signal, which is directly proportional to the temporal course of the measured primary value.
- A contactless inductive captured parameter creates a galvanically separated output signal.
- Electrical contact with the secondary circuit of the current transformer is achieved by means of a 4-polespring-clamp. This clamp is suitable for connection to a flexible conductor up to 2.5 mm<sup>2</sup>.
- A DC auxiliary voltage of ± 12 V is required to supply the electronic controls. The auxiliary voltage input must be secured by a HRC fuse size of 100 mA / 250 V microfuse.

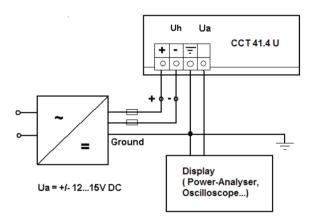
### Advantages and benefits of the CCT 41.4 U:

- Measuring of direct current as well as alternating current with only one current transformer is possible.
- Large working frequency range from 0 Hz (DC)...100 kHz (AC).
- High electric protection of the galvanically isolated capture of the measured variable.
- Low power-consumption ( $\leq 2.5$  VA)
- Easy and safety electrical connection by means of spring clamp terminal.
- Direct mounting onto the bus bar by means of integrated fixing screws which are part of the unit.
- Mounting onto 35 mm DIN-rail by means of optional supply of snap-on mounting.
- High climatic and mechanical durability, PU-resin hardened enclosures of all electrical components.

### Transfer ratio of the CCT 41.4 U:



### Wiring Diagram of the CCT 41.4 U:



### Order list:

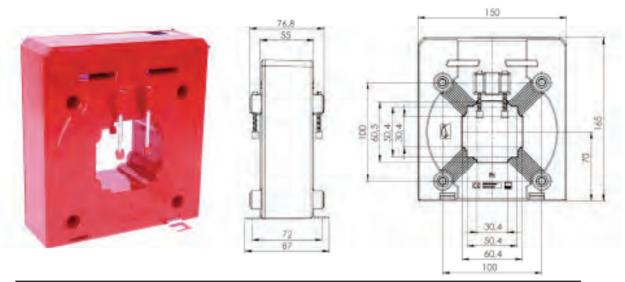
Туре	Primary current I <sub>eff</sub> [A] DC / AC (I <sub>eff</sub> )	Artno.	Voltage output
	150	1202-10005	
CCT 41.4 U	200	1202-10006	DC: 2.5 ± 1V
	250	1202-10007	
	300	1202-10008	AC: 2,5 ± 1,414 V
	400	1202-10009	(Peak-Peak)
	500	1202-10010	

### CCT 63.6 I (Compensation current transformer, MBS universal current sensor)

Current transformer for measuring both direct and alternating currents

- For use in network analysis, monitoring

- and for current measurement of non-sinusoidal and distorted networks



Dimense iores:	Applied factorical effectively:	
Ral 1: 62:30 mm	DIN EN 50178, 1998-04	Up + Up - D (Graund) In
Rail 2: 50x50 mm	DIN EN 61326-1, 2013-07	Plug-in learning
Round conductors: 50 mm	EC 61000-344	Connection cross-sections: 0.2 1.5 mm <sup>2</sup> Shipping length: 10mm
Wikith: 165 mm	DIN EN 61010-1	seitidadi saidar trava
Height 150 mm	<b>_</b>	
Tolai depit: 77 mm		
Technical dain:		
Neasuring range:	01,500 A I	
		t sanges adjusted to standard values according to IEC)
Frequency range:	DC or 16.7 h	Hz 💶 100 kHz, greater than 400 Hz only small signal -
Current culput with AC lopul signal:	AC: D 300	
Current culput with CIC input signal	DC: 0 ± 3	OOTLA
Mar. Inad resistance at current output:		g - 24 V DC)
Culput signal limitation in case of overla	aat «25 mA	
Accuracy:	±0.5%	
Nac. operating voltage U <sub>n</sub> :	0.72 IV, U <sub>N</sub>	
inautation fest voltage:		50 Hz, 12 sec., primary conductor against measuring output / housing
Auditary voltage:	± 24 V DC, ±	± 10%, edenai Ase projection via
		one 300 mA line-whe five each
Step response time (90 % km, dikit – 10	DA/μs): ×1μs	
Signal size rate dikit	> 100 A / jas	
inaulation mailerial class:	E	
Projection class:	IP 20	
Permitted additude for operation:	= 2000 m (D	IN EN 61010-1)
Nax. Semperature of the primary consta		
Working lemperature range:		< +60 °C, 0 95% rel. humidily, no condensation!
Storage temperature range:	-50°C «TL«	

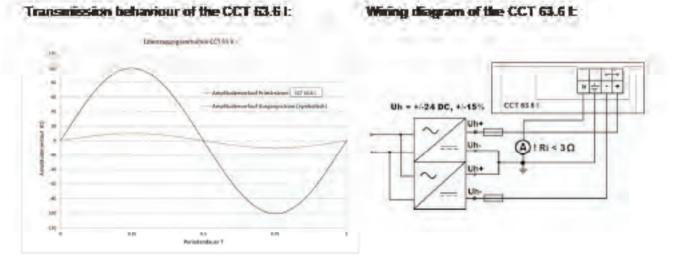
\* The measurement output must not be operated open!

### Functions of the CCT 63.6 I:

- The magnetic field surrounding a current-carrying conductor is detected by a measuring core surrounding the conductor. The magnetic flux induced in the measuring core, which is directly proportional to the current strength in the primary conductor, is detected by means of a semiconductor component. An electronic control unit integrated in the unit converts the signal supplied by the semiconductor into an output current signal directly proportional to the time curve of the measured variable.
- The inductive, contactless acquisition of the measured variable provides an electrically isolated output signal.
- The electrical contact of the secondary circuit of the current transformer is made via an 8-pole plug-in terminal. This terminal is suitable for connecting flexible stranded wires up to 1.5 mm<sup>2</sup>.
- A bipolar DC auxiliary power supply of ± 24 V DC is required to supply the control electronics. The auxiliary voltage inputs must be protected by a 300 mA / 250 V / F line-wire fuse.

### Advantages and benefits of the CCT 63.6 E

- Measurement of both direct and alternating currents is possible with only one bansformer.
- Wide working irrequency range from 0 Hz (DC) to 100 kHz (AC).
- High electrical safety due to galvanically isolated acquisition of the measured variable.
- Low power consumption (\$ 2.5 VA)
- Simple and safe electrical wiring using proven plug-in terminal technology.
- Direct mounting on busbars by means of fixing screeps integrated in the unit.
- High climatic and mechanical resistance due to PU encapsulation of all electrical components.



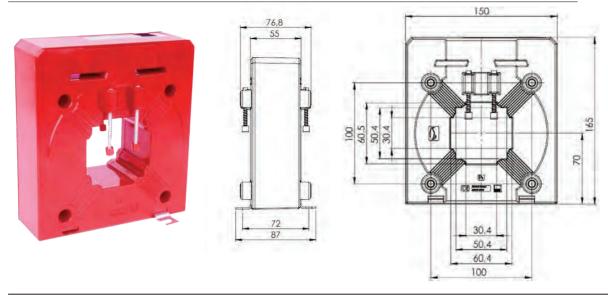
#### Ordering table

Туре	Primary current [A] DC / AC (lef)	Article number	Output signal
CCT 83.6 I	2000	1301-10008	DC: 0 ± 300mA AC: 0 300 mA ler

CCT 63.6 RMS (Compensation current transformer, MBS universal current sensor)

Current transformer for measuring both direct and alternating currents - For current measurement of non-sinusoidal and distorted (constant)networks

- As current transducer for direct input wiring of PLC input cards



Dimensions:	Applied techni	ical standards:	Electrical connections:
Rail 1: 60x30 mm	DIN EN 50178,	1998-04	Uн + Uн - 0 (Ground) IA
Rail 2: 50x50 mm	IEC 61000-3/4		Plug-in terminal
Round conductors: 50 mm Width: 165 mm Height: 150 mm Total depth: 77 mm	DIN EN 61010- DIN EN 61326-	,	Connection cross-sections: 0.2 1.5 mm <sup>2</sup> Stripping length: 10mm
Technical data:			
Measuring range:			0 1,500 A IRMS AC, depending on variant! Jes adjusted to standard values according to IEC)
Frequency range:			$6 \text{ kHz}, \text{ crest factor } \leq 4$
Power output:			rue effective value measurement
Max. load resistance at current output		R <sub>B</sub> ≤ 500 Ω (U <sub>H</sub> =	± 24 V DC)
Output signal limitation in case of over	load:	< 30 mA	
Accuracy:		± 1.0%	
Max. operating voltage Um:		0.72 kV, U <sub>eff</sub>	
Insulation test voltage:		6.4 kV, U <sub>eff</sub> , 50 Hz	z, 12 sec., primary conductor against measuring output / housing
Auxiliary voltage:		± 24 V DC, ± 10%	6, external fuse protection via one 300 mA fine-wire fuse each
Step response time (90 % IPN, di/dt = 1	00 A / µs):	≤ 200 ms	
Signal slew rate di/dt:		> 100 A / µs	
Insulation material class:		E	
Protection class:		IP 20	
Permitted altitude for operation:		≤ 2000 m (DIN EI	N 61010-1)
Max. temperature of the primary condu	uctor:	100 °C	
Working temperature range:		-25 °C < T∪ < +60	°C, 0 95% rel. humidity, no condensation!
Storage temperature range:		-50 °C < T∟< +90	

### Functions of the CCT 63.6 RMS:

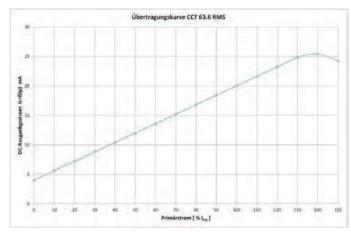
- The magnetic field surrounding a current-carrying conductor is detected by a measuring core surrounding the conductor. The magnetic flux induced in the measuring core, which is directly proportional to the current strength in the primary conductor, is detected by means of a semiconductor component. An electronic control unit integrated in the unit converts the signal supplied by the semiconductor into a DC output current signal proportional to the true effective value of the measured variable. The true effective values are calculating using the delta-sigma method.
- The inductive, contactless acquisition of the measured variable provides an electrically isolated output signal.
- The electrical contact of the secondary circuit of the current transformer is made via an 8-pole plug-in terminal. This terminal is suitable for connecting flexible stranded wires up to 1.5 mm<sup>2</sup>.
- A bipolar DC auxiliary power supply of ± 24 V DC is required to supply the control electronics. The auxiliary voltage inputs must be protected by a 300 mA / 250 V / F fine-wire fuse.

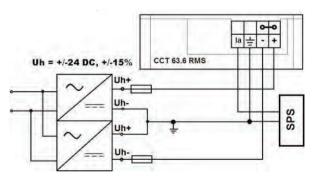
### Advantages and benefits of the CCT 63.6 RMS:

- Measurement of both direct and alternating currents is possible with only one transformer.
- Accurate calculation of the true effective values of almost any time curve of the current to be measured.
- Wide working frequency range from 0 Hz (DC) to 20 Hz ... 6 kHz (AC).
- High electrical safety due to galvanically isolated acquisition of the measured variable.
- Low power consumption (≤ 2.5 VA)
- Simple and safe electrical wiring using proven plug-in terminal technology.
- Direct mounting on busbars by means of fixing screws integrated in the unit.
- High climatic and mechanical resistance due to PU encapsulation of all electrical components.

### Transmission behaviour of the CCT 63.6 RMS:

Wiring diagram of the CCT 63.6 RMS:





### **Ordering table**

Туре	Primary current IRMS [A]	Article number	Output signal
CCT 63.6 RMS	2000	1303-10006	4 20 mA DC



### **SWMU 31.5**

Measuring transducer for alternating current

### with or without auxiliary power supply with integrated current transformer housing unit for 35 mm DIN rail

### Features/benefits

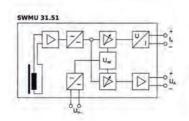
- measuring input: Sinus-shaped AC current (1 A ... 750 A),
- arithmetical mean value measurement, effective value calibrated
- measuring output: Unipolar output signal
- measuring principle: Rectifier process
- with integrated current transformer
- minimal wiring

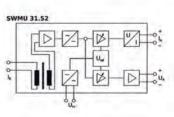
### Application

Measuring transducers for the transformation of sinus-shaped AC current. For an output signal a load-independent DC current / and an imprinted DC voltage signal is available, which stands proportionally to the measurement value of the input volume.

These signals can be used for display, recording, monitoring and/or control function. The measuring transducer fulfills the requirements and regulations with regard to the electromagnetic compatibility (EMV) and security (IEC 1010 and EN 61010).

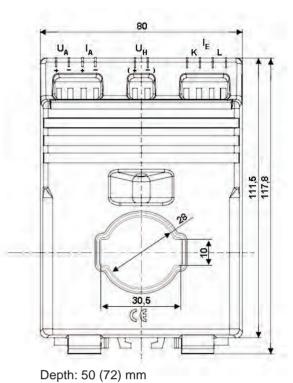
	Tochnical data SW	MU 31.51/52 SWMU 32	51/52
measuring input	Technical data SW	auxiliary power	.51/52
nominal frequency	f <sub>N</sub> 50/60 Hz	AC power supply	230 V ± 10% (50…60 Hz)
rated input current I <sub>N</sub>		DC	24 V ± 15%
SWMU 31.52	110 A	power input	≤ 1.5 W (2.5 VA)
SWMU 31.51	15750 A	accuracy	
consumption	≤ 1 VA (2.5 VA with-	reference value	output end value
·	out auxiliary voltage)	accuracy class	class 0.5
overload capacity	1.5 · I <sub>N</sub> , constant	warming-up time	≤ 5 min.
	8 · I <sub>N</sub> , 40 sec.	protection	
measuring output		electrocution	IP 40, housing
load-independent DC current	020 mA or	protection	(test wire, EN 60529)
	420 mA*		IP 20, connection terminals
max. burden resistance	≤ 500 Ω		(test digit, EN 60529)
max. burden voltage	≤ 15V	contamination class	2
current limit		test voltages	4 kV, active circuits against housing
under overload	≤ 34 mA	(DIN 57411)	4 kV, auxiliary voltage against
imprinted DC voltage	010 V or		measuring output (230 V AC-version)
	210 V*		500 V, auxiliary voltage against
burden resistance	≥ 10 kΩ		measuring output (24 V DC-version)
max. burden voltage			
under overload	≤ 18 V	*Live-Zero only with a	uxiliary power
voltage limit	≤ 18 V		
residual ripple			
of the output current	≤ 1% p.p.		
response time	≤ 500 ms	Please note: Mountin	g base for direct fitting without use of
operating temperature range	-5° C ≤ δ ≤ +40° C	35mm DIN rail include	ed in the deliveries





r					
_	Primary			ng output	
Туре	current	020mA	420mA	020mA	420mA
SWMU	[A]	and	and	and	and
	[7]	010V	010V	210V	210V
	1	31-1006	31-2006	31-3006	31-4006
31.52	5	31-1007	31-2007	31-3007	31-4007
	10	31-1008	31-2008	31-3008	31-4008
	15	31-1009	31-2009	31-3009	31-4009
	20	31-1010	31-2010	31-3010	31-4010
	25	31-1011	31-2011	31-3011	31-4011
	30	31-1012	31-2012	31-3012	31-4012
	40	31-1013	31-2013	31-3013	31-4013
	50	31-1014	31-2014	31-3014	31-4014
	60	31-1015	31-2015	31-3015	31-4015
	75	31-1016	31-2016	31-3016	31-4016
31.51	100	31-1017	31-2017	31-3017	31-4017
	150	31-1018	31-2018	31-3018	31-4018
	200	31-1019	31-2019	31-3019	31-4019
	250	31-1020	31-2020	31-3020	31-4020
	300	31-1021	31-2021	31-3021	31-4021
	400	31-1022	31-2022	31-3022	31-4022
	500	31-1023	31-2023	31-3023	31-4023
	600	31-1024	31-2024	31-3024	31-4024
	750	31-1025	31-2025	31-3025	31-4025

### 1. Auxiliary power supply 230 V AC



measuring frequency 50/60 Hz weight: 350 g

2. Auxiliary	power	supply	24	V DC	

	Measuring output				
	Primary				
Туре	current	020mA	420mA	020mA	420mA
SWMU	[A]	and	and	and	and
	[~]	010V	010V	210V	210V
	1	31-5006	31-6006	31-7006	31-8006
31.52	5	31-5007	31-6007	31-7007	31-8007
	10	31-5008	31-6008	31-7008	31-8008
	15	31-5009	31-6009	31-7009	31-8009
	20	31-5010	31-6010	31-7010	31-8010
	25	31-5011	31-6011	31-7011	31-8011
	30	31-5012	31-6012	31-7012	31-8012
	40	31-5013	31-6013	31-7013	31-8013
	50	31-5014	31-6014	31-7014	31-8014
	60	31-5015	31-6015	31-7015	31-8015
	75	31-5016	31-6016	31-7016	31-8016
31.51	100	31-5017	31-6017	31-7017	31-8017
	150	31-5018	31-6018	31-7018	31-8018
	200	31-5019	31-6019	31-7019	31-8019
	250	31-5020	31-6020	31-7020	31-8020
	300	31-5021	31-6021	31-7021	31-8021
	400	31-5022	31-6022	31-7022	31-8022
	500	31-5023	31-6023	31-7023	31-8023
	600	31-5024	31-6024	31-7024	31-8024
	750	31-5025	31-6025	31-7025	31-8025

measuring frequency 50/60 Hz weight: 250 g

### 3. Without power supply

Type SWMU	Primary current [ A ]	Measuring output 020mA and 010V
	1	31-9006
32.52	5	31-9007
	10	31-9008
	40	31-9013
	50	31-9014
	60	31-9015
	75	31-9016
	100	31-9017
	150	31-9018
32.51	200	31-9019
	250	31-9020
	300	31-9021
	400	31-9022
	500	31-9023
	600	31-9024
	750	31-9025

power requirements  $P_E \ge 2,5 \text{ VA }!$ measuring frequency 50/60 Hz weight 600g operating range 15 ... 120 % I<sub>N</sub>



### **SWMU 41.5**

Measuring transducer for alternating current

### with or without auxiliary power supply with integrated current transformer housing unit for 35 mm DIN rail

### Features/benefits

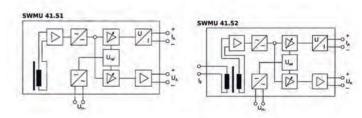
- measuring input: Sinus-shaped AC current (1 A ... 800 A),
- arithmetical mean value measurement, effective value calibrated
- measuring output: Unipolar output signal
- measuring principle: Rectifier process
- with integrated current transformer
- minimal wiring

### Application

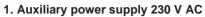
Measuring transducers for the transformation of sinus-shaped AC current. For an output signal a load-independent DC current / and an imprinted DC voltage signal is available, which stands proportionally to the measurement value of the input volume.

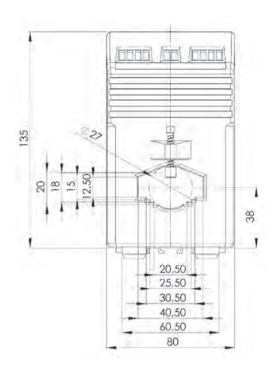
These signals can be used for display, recording, monitoring and/or control function. The measuring transducer fulfills the requirements and regulations with regard to the electromagnetic compatibility (EMV) and security (IEC 1010 and EN 61010).

	Technical data SW	MU 41.51/52 SWMU 42.	.51/52
measuring input		auxiliary power	
nominal frequency	f <sub>N</sub> 50/60 Hz	AC power supply	230 V ± 10% (5060 Hz)
rated input current $I_N$		DC	24 V ± 15%
SWMU 41.52	110 A	power input	≤ 1.5 W (2.5 VA)
SWMU 41.51	15800 A	accuracy	
consumption	≤ 1 VA (2.5 VA with-	reference value	output end value
	out auxiliary voltage)	accuracy class	class 0.5
overload capacity	1.5 · I <sub>N</sub> , constant	warming-up time	≤ 5 min.
	8 · I <sub>N</sub> , 40 sec.	protection	
measuring output		electrocution	IP 40, housing
load-independent DC current	020 mA or	protection	(test wire, EN 60529)
	420 mA*		IP 20, connection terminals
max. burden resistance	≤ 500 Ω		(test digit, EN 60529)
max. burden voltage	≤ 15V	contamination class	2
current limit		test voltages	4 kV, active circuits against housing
under overload	≤ 34 mA	(DIN 57411)	4 kV, auxiliary voltage against
imprinted DC voltage	010 V or		measuring output (230 V AC-version)
	210 V*		500 V, auxiliary voltage against
burden resistance	≥ 10 kΩ		measuring output (24 V DC-version)
max. burden voltage			
under overload	≤ 18 V	*Live-Zero only with a	uxiliary power
voltage limit	≤ 18 V		
residual ripple			
of the output current	≤ 1% p.p.		
response time	≤ 500 ms	Please note: Mounting	g base for direct fitting without use of
operating temperature range	-5° C ≤ δ ≤ +40° C	35mm DIN rail include	ed in the deliveries



	Primary			ng output	
Туре	current	020mA	420mA	020mA	420mA
SWMU	[A]	and	and	and	and
	[~]	010V	010V	210V	210V
	1	61006	62006	63006	64006
41.52	5	61007	62007	63007	64007
	10	61008	62008	63008	64008
	15	61009	62009	63009	64009
	20	61010	62010	63010	64010
	25	61011	62011	63011	64011
	30	61012	62012	63012	64012
	40	61013	62013	63013	64013
	50	61014	62014	63014	64014
	60	61015	62015	63015	64015
	75	61016	62016	63016	64016
41.51	100	61017	62017	63017	64017
41.51	150	61018	62018	63018	64018
	200	61019	62019	63019	64019
	250	61020	62020	63020	64020
	300	61021	62021	63021	64021
	400	61022	62022	63022	64022
	500	61023	62023	63023	64023
	600	61024	62024	63024	64024
	750	61025	62025	63025	64025
	800	61026	62026	63026	64026





measuring frequency 50/60 Hz weight: 350 g

Depth: 50 (72) mm

### 2. Auxiliary power supply 24 V DC

	, y ponor e	Manager			
	Primary		Measurir	ng output	
Туре	current	020mA	420mA	020mA	420mA
SWMU	[A]	and	and	and	and
	[4]	010V	010V	210V	210V
	1	65006	66006	67006	68006
41.52	5	65007	66007	67007	68007
	10	65008	66008	67008	68008
	15	65009	66009	67009	68009
	20	65010	66010	67010	68010
	25	65011	66011	67011	68011
	30	65012	66012	67012	68012
	40	65013	66013	67013	68013
	50	65014	66014	67014	68014
	60	65015	66015	67015	68015
	75	65016	66016	67016	68016
41.51	100	65017	66017	67017	68017
41.31	150	65018	66018	67018	68018
	200	65019	66019	67019	68019
	250	65020	66020	67020	68020
	300	65021	66021	67021	68021
	400	65022	66022	67022	68022
	500	65023	66023	67023	68023
	600	65024	66024	67024	68024
	750	65025	66025	67025	68025
	800	65026	66026	67026	68026

measuring frequency 50/60 Hz weight: 250 g

### 3. Without auxiliary power supply

Turno	Primary	Measuring output
Type SWMU	current [ A ]	0…20mA and
		010V
	1	69006
42.52	5	69007
	10	69008
	40	69013
	50	69014
	60	69015
	75	69016
	100	69017
	150	69018
42.51	200	69019
42.01	250	69020
	300	69021
	400	69022
	500	69023
	600	69024
	750	69025
	800	69026

power requirements  $P_E \ge 2,5$  VA! measuring frequency 50/60 Hz weight: 600g operating range 15 ... 120 % I<sub>N</sub>



### NMC

Measuring transducer for AC currents

### Clip-on measuring transducer for MBS current transformers in modular construction. Versions with (NMC 2/3/4) or without auxiliary voltage supply (NMC 0).

### Features/benefits

- Measuring input: Sinus-shaped AC current (1 A or 5 A),
  - arithmetical mean value measurement, effective value calibrated
- Measuring output: Unipolar output signal
- Measuring principle: Rectifier process
- Direct notching with MBS current transformers through contact studs
- Economic wiring

### Application

Measuring transducers for the transformation of sinus-shaped AC current. For an output signal a load-independent DC current and in imprinted DC voltage signal is available, which stands proportionally to the measurement value of the input volume.

These signals can be used for display, recording, monitoring and or control function. Simultaneously, the secondary current of the current transformer can be utilized to operate conventional needle instruments.

The measuring transducer fulfills the requirements and regulations with regard to the electromagnetic compatibility (EMC) and security (IEC 1010 and EN 61010). This measuring transducer has been designed, produced and tested in accordance with ISO 9001.

	T	echnical data		
Measuring input		Accuracy		
Nominal frequency f <sub>N</sub>	50/60 Hz	Reference value	Output end value	
Rated input current I <sub>N</sub>	1 A or 5 A	Accuracy class	0.5 %	
Power input from measuring circuit	≤ 1 VA (2.5 VA w/o auxiliary voltage	Accuracy range	1 … 120 % I <sub>N</sub> (NMC 2/3/4) 15 … 120 % I <sub>N</sub> (NMC 0)	
Overload capacity	1.2 · I <sub>N</sub> , constant	Warming-up time	≤ 5 min.	
	8 · I <sub>N</sub> , 40 sec.	Auxiliary power		
Measuring output		AC power supply	230 V ± 10% (5060 Hz) or	
Load-independent DC current	0 (4) 20 mA		110 V ± 10% (5060 Hz)	
max. burden resistance	≤ 500 Ω	DC	24 V ± 15%	
max. burden voltage	≤ 15V	Power input	≤ 1.5 W (2.5 VA)	
Current limit under	≤ 34 mA	Protection		
overload		Electrocution	IP 40, housing	
Residual ripple of the	≤ 1 % p.p.	protection	(test wire, EN 60529)	
output current			IP 20, Connection terminals	
Imprinted C voltage	0 (2) 10 V		(Test digit, EN 60529)	
min. burden resistance	≥ 10 kΩ	Contamination class	2	
max. burden voltage	≤ 18 V	Test voltages	4 kV, active circuits against housing	
under overload		(DIN 57411)	4 kV, auxiliary voltage against	
Response time	< 500 ms		measuring output (230 V AC-version)	
			500 V, auxiliary voltage against	
			measuring output (24 V DC-version)	

NMC measuring transducer for sinus-shaped alternating currents, for clip-on onto MBS current transformer (rectifier-mean value measurement)

Auxiliary power supply 24 V DC, galvanically separated

Туре	Ме	asuring outp	outs	Primary	Suitable for	
NMC (2)	020 mA and 010 V	420 mA and 010 V	420 mA and 210 V	current [A]	CTs in the product range	
211	39212	39232	39252	1	А	
212	39213	39233	39253	1	В	
213	39214	39234	39254	1	С	
214	39215	39235	39255	1	D	
221	39012	39032	39052	5	A	
222	39013	39033	39053	5	В	
223	39014	39034	39054	5	C	
224	39015	39035	39055	5	D	

Nominal frequency 50/60 Hz; Weight: 80 g; Operating range 0 ... 120 %  $I_{\rm N}$ 

### Auxiliary power supply 230 V AC, galvanically separated

-										
Turno	Ме	asuring outp	Primary	Suitable for						
Type NMC (3)	020 mA and 010 V	420 mA and 010 V	420 mA and 210 V	current [A]	CTs in the product range					
311	36212	36232	36252	1	А					
312	36213	36233	36253	1	В					
313	36214	36234	36254	1	С					
314	36215	36235	36255	1	D					
321	36041	36032	36052	5	A					
322	36042	36033	36053	5	В					
323	36043	36034	36054	5	С					
324	36044	36035	36055	5	D					
Nominal	frequency 50	V60 Hz· Woia	ht: 80 a. Oper	opner paine	0 120 % 1.					

Nominal frequency 50/60 Hz; Weight: 80 g; Operating range 0  $\ldots$  120 %  $I_{N}$ 

### Auxiliary power supply 110 V AC, galvanically separated

Turno	Me	asuring outp	outs	Primary	Suitable for
Type NMC (4)	020 mA and	420 mA and	420 mA and	current [A]	CTs in the product
	010 V	010 V	210 V		range
411	76212	76232	76252	1	A
412	76213	76233	76253	1	В
413	76214	76234	76254	1	С
414	76215	76235	76255	1	D
421	76012	76032	76052	5	A
422	76013	76033	76053	5	В
423	76014	76034	76054	5	С
424	76015	76035	76055	5	D
Nominal	froquoney 50	V60 Hz. Woia	ht: 80 a. Opou	oting rango	0 120 % 1

Nominal frequency 50/60 Hz; Weight: 80 g; Operating range 0  $\dots$  120 %  $I_N$ 

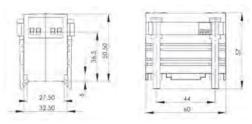
#### Without auxiliary power supply, power requirement ≥ 2.5 VA

Type NMC (0)	Measuring outputs 020 mA and 010 V	Primary current [A]	Suitable for CTs in the product range	
011	37212	1	A	
012	37213	1	В	
013	37214	1	С	
014	37215	1	D	
021	37012	5	A	
022	37013	5	В	
023	37014	5	С	
024	37015	5	D	

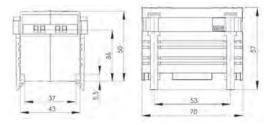
Nominal frequency 50/60 Hz; Weight: 80 g; Operating range 15...120 % IN

### Drawings

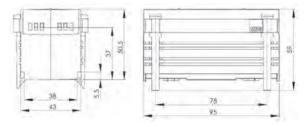
### Construction type "A"



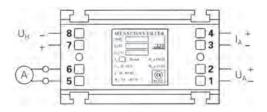
### Construction type "B" / "C"



### Construction type "D"

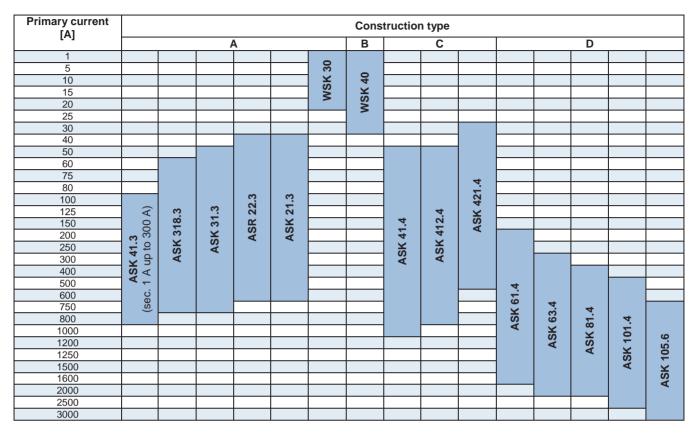






**Comment:** The dimensions of the measuring transducer are relevant only for the adaption to the existing current transformer construction types. All units consist of the same electronic modules.

### **NMC** selection chart



### NMC-AD

Adaptor for current transformers of any make to clip onto 35 mm DIN rail

#### Features/benefits

- Accomodation of any make of current transformers in connection with transducers of type NMC
- Direct mounting of measuring transducer, in visual devision

Artno.	Application with NMC artno.
to the measuri	ng point, onto a standard 35 mm DIN rail

Artno.	Application with NMC artno.	
36011	39xx2; 36xx1/2; 37xx2; 76xx2	

### Short circuit adaptor NMC-KSx





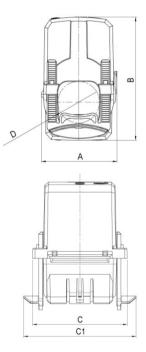
Connection	Description
6, 7	Incoming terminals 5 A or 1 A (sourced from current transformer)

### Application

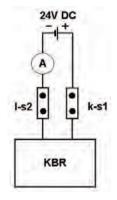
Adaptors of type NMC-KSx are clipped onto current transformers. When the secondary circuit of a current transformer is not being energized the adaptors prevent idling of the transformer, and thus the occurrence of high neutral voltages in the nominal current of the current transformer.

Turne	Art				Appli	cable w	ith MB	S currei	nt transf	ormer t	ypes				Draw-
Type NMC-KSx		WSK	WSK	ASR	ASK	ASK	ASK	ASK	ASK	ASK	ASK	ASK	ASK	ASK	_
NIVIC-NSX	no.	30	40	22.3	21.3	31.3	41.3	41.4	421.4	61.4	63.4	81.4	101.4	105.6	ing
0	39090	•		•	•	•	•								Α
1	39091		•												B/C
2	39092							•	•						B/C
3	39093									•	•	•	•	•	D





#### Wiring diagram of the KBR 32 + 44 With DC output current 4...20 mA



### Split-core current transformer, type KBR

With voltage output 0...333 mV or with DC current output 4...20 mA DC

### Features / benefits

- Perfect for subsequent assembly into already existing installations
- Due to the "click"-system even a one-hand mounting is possible
   Deliverable as a current sensor (0...333 mV) or measuring
- transducer (4...20 mA DC) or with AC secondary current 5 A / 1 A. - Auxiliary power supply via output circuit (<u>2-wire connection</u>)
- Three different construction types

### Available measuring ranges

KBR 18 (Inner diameter: 18.5 mm):

- Primary current: 50 250 A
- Voltage output: 0...333 mV
- Accuracy class 1
- KBR 32 (Inner diameter: 32.5 mm):
  - Primary current: 100 600 A
- Current or voltage output: 4...20 mA DC or 0...333 mV
- Accuracy class 1

KBR 44 (Inner diameter: 44 mm):

- Primary current: 250 1000 A
- Current or voltage output: 4...20 mA DC or 0...333 mV

4...20 mA:

- Accuracy class 1

### General technical specifications

- Length of connection cable: 0...3
  - 0...333 mV: 2.5 m, cross section 2x0.75 mm<sup>2</sup>
    - 2.5 m, cross section 2x0.75 mm<sup>2</sup>
    - (Other lengths are possible on request)
- Operating temperature: -5°C < T < +50°C
- Storage temperature: -25°C < T < +70°C
- Therm. nominal continuous rated current  $I_{cth}$ : 1.2 x  $I_N$
- Therm. nominal short-time current Ith: 60 x IN, 1 sec.
- Max. operating voltage Um: 0.72 kV
- Isolation test voltage: 3 kV, U<sub>eff</sub>, 50 Hz, 1 min.
- Rated frequency: 50 Hz
- Isolation class: E
- Applicable technical standard: DIN EN 61869, part 1 + 2

### Dimensions

Туре	A (width) [ mm ]	B (height) [ mm ]	C / C1 (depth) [ mm ]	D (diameter) [ mm ]
KBR 18	41.6	64.5	55 / 67.3	18.5
KBR 32	59.2	96.4	75 / 89.2	32.5
KBR 44	72.2	120.6	85 / 98.1	44

### Technical characteristics for the KBR with output signal 4...20 mA:

- 2-wire connection, auxiliary power via output circuit
- Auxiliary power: 24 V DC  $\pm$  15 %, P<sub>V</sub> = max. 1 VA
- Load-independent DC current: Live-zero, 4...20 mA
- External resistance: max. 300 Ω
- Current limit under overload: < 30 mA</li>
- Residual ripple of the output current:  $\leq$  1 % p.p.
- Response time: < 300 ms

### 5°C < T < +50°C 5°C < T < +70°C



MBS's measuring transducers of the type EMBSIN transforms an input alternating voltage and/or an input alternating current, received as a standard signal from a current transformer, – or voltage transformer, or from the power system, into a load imprinted output voltage.

The various EMBSIN units are arranged to collate all measuring variables, which are necessary to monitor and to control, the power supply and consumption, to display the output signals, or to accept these into other units of the measuring- and control technic.

Several units such as indicators, recorders or signal processing systems can be connected to the output. The transducer's configuration assures a safe division for all functions for a galvanic separation between inputs and outputs. The most important applications for the transducers are in the generation and distribution of energy, in the manufacturing industry, and panel building enterprises.

The transducers have been developed upon an intirely new housing technology concept and are available in 5 different sizes.

The housing material made of high quality polycarbonate are **free of silicon as well as halogen** and, are flame resistant. High quality screw terminals are provided for the safe connections of inputs and outputs. Fitment onto the base wall is made with a 35 mm DIN rail. All electrical connections are made at the top of the units for safe and easy access. The transducers bear the CE symbol. This symbol provides the highest level of protection for humans, the machine, as well as the environment, and of course, comply with all applicable safety regulations.

MBS's production of high current measuring transducers, made of the finest quality enjoy a long tradition and a distinguished worldwide reputation.

The encapsuled housing design, the carefully chosen material and the construction principles, contribute that the measuring transducers are protected against climatic conditions (temperature and humidity), atmospheric conditions (chemical processes, dust and salt), vibration and shocks, interruptions (electrical or mechanical), HF interferences (communications) as well as permanent or transient interference voltages on all electrical connections.

### Compact • Safety • Easy to use • Accurate • Better

### Safety

EN 61010 also on the terminals! 690 V max. input voltage Hosing material: Polycarbonate Fire resistance class: V-0 acc. to UL94 (self-extinguishing, halogen- free, silicon-free)

### Easy to use

Units with two wide-end auxiliary power ranges 24...65 V AC/DC or 85...230 V AC/DC Auxiliary power, to be connected either on the top or on the bottom  $\cos \varphi$  or linear recalibrating can be synchronized without opening the unit and without AC calibrators! Mounting onto 35mm DIN rail Operating instructions are included

Compact		
Height	60 mm	
Depth	112 mm	
Width	105 mm for	power,
	70 mm for	frequency and phase as well as <i>U</i> and <i>I</i> with wide-range auxiliary power,
	35 mm with	two-wire feed 24 V DC or 230 V AC
	35 mm for	current and voltage without auxiliary power supply

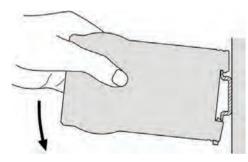
### Accuracy

All units class 0.5 EMBSIN 241 F class 0.2 EMBSIN 241 FD class 0.2

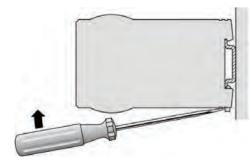
### Better

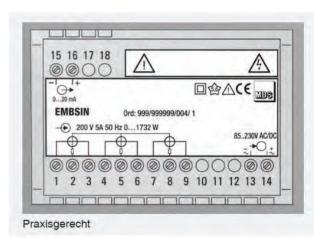
Highest quality and safety at very competitive prices!

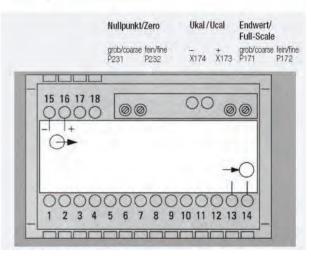
#### Assembly



#### Dismantling







Intermediate circuit calibration





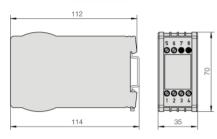
### Measuring transducer for AC current

### Features / benefits

- Without auxiliary voltage supply
- With two measuring ranges (selectable at terminals)
  - Housing for 35mm DIN rail mounting
- Measuring input: Sinus-shaped alternating current (0...1/5 A or 0...1.2/6 A, selectable at terminals), arithmetical mean value measurement, effective value calibration
- Measuring output: Unipolar output signal
- Measuring principle: Rectifier mean value measurement process
- Economic wiring

### Application

•



Measuring transducer for the transformation of sinus-shaped alternating current. A load-independent DC signal which is proportional to the measurement value serves as an output signal, and allows for display, recording, monitoring and/or control functions. This measuring transducer fulfills the requirements and regulations with regard to the electromagnetic compatibility (EMC) and safety (IEC 1010 and EN 61010). These measuring transducers are designed for indoor use only.

	Те	chnical data	
Measuring input		Temperature influence	0.2 % / 10 K
Rated frequency f <sub>N</sub>	50/60 Hz	(-10 +55 °C)	
Rated input current I <sub>N</sub>	1 / 5 A or 1.2 / 6 A	Operating temperature	-10 °C up to +55 °C
	(selectable at terminal)	Storage temperature	-40 °C up to +70 °C
Consumption	≤ 2.5 VA	Safety	
Overload capacity	$1.2 \cdot I_N$ , constant	Protection class	II (protection isolated, DIN EN 61010)
	20 · I <sub>N</sub> , 1 sec.	Electrocution protection	IP 40, housing
Measuring output			(test wire, EN 60529)
Load-independent DC current	05 mA, 010mA		IP 20, connection terminals
	or 020 mA		(test digit, EN 60529)
Max. burden voltage	≤ 15 V	Contamination class	2
Voltage limit by	≤ 30 V	Overvoltage category	111
R <sub>EXT</sub> = ∞		Nominal isolation voltage	250 V, input
Current limit	≤ 34 mA	(to earth)	40 V, output
under overload		Test voltages	50 Hz, 1 min., EN 61010-1
Residual ripple of the	≤ 1 % p.p.		3.7 kV, rms, Measuring input against
output current			measuring output and exterior surface
Response time	< 500 ms		490 V, Measuring output against
Accuracy			exterior surface
Reference value	Output end value	Weight	270 g
Accuracy class	Class 0.5		
Measuring range	0100 % I <sub>N</sub>		

### **Order lists**

### EMBSIN 100 I – Measuring transducer for AC current, without auxiliary power supply

Features	Order no.					
EMBSIN 100 I, Measuring transducer for AC current						
Order no.: 100 l – Mxxxx	100 l –	М	Х	Х	Х	Х
1. Construction						
Housing MBS for 35 mm DIN rail		Μ				
2. Measuring range						
01/5 A			1			
01.2/6 A			2			
9 Nonstandard (A),			9			
00.5 A up to 07.5 A						
(only one measuring range!) A						
3. Output signal				1		
05 mA, $R_a \leq 3 \text{ k}\Omega$						
$010 \text{ mA}, R_a \le 1.5 \text{ k}\Omega$				2		
$020 \text{ mA}, R_a \le 750 \Omega$				3		
4. Measuring range adjustable					0	
Measuring range fixed						
Measuring end value adjustable approx. ±10%					1	
5. Test certificates						
without test certificate						0
with test certificate in German						D
with test certificate in English						E

Rated frequency of the measuring signal: 50/60 Hz

31





Measuring transducer for AC current

### Features / benefits

- With auxiliary voltage supply
- Optional with measuring output 4...20 mA and/or 2-wire technic
- Housing for 35mm DIN rail mounting
- Measuring input: Sinus-shaped alternating current, arithmetical mean value measurement, effective value calibration
- Measuring output: Unipolar and live-zero output signals
- · Measuring principle: Rectifier mean value measurement process
- AC or DC auxiliary power supply

#### Application

A load-independent DC signal or imprinted DC voltage signal is available, which stands proportionally to the measurement value of the input volume. This measuring transducer fulfills the requirements and regulations with regard to the electromagnetic compatibility (EMC) and safety (IEC 1010 and EN 61010). These measuring transducers are designed for indoor use only.

Technical data						
Measuring input		Operating temperature	-10 °C up to +55 °C			
Rated frequency f <sub>N</sub>	50/60 Hz	Storage temperature	-40 °C up to +70 °C			
Rated input current I <sub>N</sub>	01 A or 05 A	Auxiliary power				
	optionally: 01.2 A or 06 A	AC	24, 110, 115, 120, 230 or 400 V, ± 15 %, 50/60 Hz; P <sub>V</sub> approx. 3 VA			
Consumption	≤ 5 mV x I <sub>N</sub>	DC	24 V, -15 / +33 % or			
Overload capacity	$2 \cdot I_N$ , constant		24 V, -50 / +33 %			
Measuring output			by 2-wire feed and output			
Load-independent DC current	02.5 mA to 020 mA		420 mA; $P_V$ approx. 1.5 W			
	or live-zero	Safety				
	15 mA to 420 mA	Protection class	II (protection isolated, DIN EN 61010)			
Max. burden voltage	≤ 15 V	Electrocution protection	IP 40, housing			
By 2-wire connection	Standard range 420 mA		(test wire, EN 60529)			
	External resistance R <sub>EXT</sub>		IP 20, connection terminals			
	dependant of the auxiliary		(test digit, EN 60529)			
	supply H (1232 V DC)	Contamination class	2			
	$R_{EXT}[k\Omega] \le (H-12)V/20mA$	Overvoltage category				
Imprinted DC voltage	05 V to 010 V	Nominal isolation voltage	300 V, input			
	or live-zero	(to earth)	300 V, auxiliary power AC			
	15 V to 210 V		50 V, auxiliary power 24 V DC			
Load capacity	max. 20 mA		50 V, output			
Voltage limit by R <sub>EXT</sub> = ∞	≤ 40 V	Test voltages	50 Hz, 1 min., EN 61010-1			
Current limit	≤ 30 mA		3.7 kV, rms, Measuring input against			
under overload			all other circuits and exterior surface			
Residual ripple of the	≤ 1 % p.p.		as well as AC auxiliary power input			
output current			against output and exterior surface;			
Response time	< 300 ms		490 V, Measuring output against			
Accuracy			exterior surface and DC auxiliary			
Reference value	Output end value		power input against exterior surface			
Accuracy class	Class 0.5	Weight	195 g			

### EMBSIN 101 I – Measuring transducer for AC current

Features	Order no.						
EMBSIN 101 I, Measuring transducer for AC current							
Order no.: 101 l – Mxx xx	101 I –	м	X	X	X	X	X
1. Construction							
Housing MBS for 35 mm DIN rail		M					
2. Frequecy of the input voltage / input current						1	
Rated frequency 50/60 Hz			1				
3. Measuring range			1	1			
01 A				A			
05 A				В			
Z) A				Z	İ		
Z) Nonstandard [A] 00.8 up to 01.2 or 04 up to 06							
4. Output signal							
020 mA					1		
420 mA					2	-	
420 mA, 2-wire-connection / feed					3	+	
,					9		
9) mA							
! 9) Nonstandard [mA] 02.5 up to 0< 20							
15 up to < (4 20)							
010 V					A		
Z) V					Z		
! Z) Nonstandard (V) 05.0 up to 0< 10	Ì				İ	Í	
15 up to 210							
5. Auxiliary voltage							
Auxiliary voltage $U_{\rm b}$ : 24 V AC						1	
Auxiliary voltage U: 110 V AC						2	
Auxiliary voltage U: 115 V AC						3	
Auxiliary voltage U <sub>1</sub> : 120 V AC						4	
Auxiliary voltage $U_{\rm h}$ : 230 V AC						5	
Auxiliary voltage $U_{h}$ : 400 V AC, ! max. 300 V to earth!						6	
Auxiliary voltage $U_{\rm h}$ : 24 V DC	-					A	
Auxiliary voltage $U_h$ : 24 V DC via output circuit						B	
Auxiliary voltage $U_h$ : 85230 V AC/DC						C	
Auxiliary voltage $U_h$ : 2460 V AC/DC						D	
· - 1							
U <sub>h</sub> rated voltage permissible tolerances for AC -15+33%							
permissible tolerances for DC –15+15%							
•							
permissible tolerances for DC via output circuit -50+33% ! 1) to A) not to be combined with output signal, order no.: 3)							
<pre>!B) not to be combined with output signal, order no.: 1), 2), 9), A), Z)</pre>							
6. Test certificates							
without test certificate							0
with test certificate in German							D
with test certificate in English							E



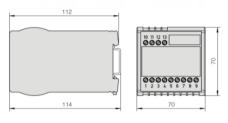


Measuring transducer for AC current

### Features / benefits

- Auxiliary voltage supply with integrated AC/DC universal power supply
- Effective value measuring, logarithmical measurement process
- With two measuring ranges (selectable at terminals): 0...1/5 A or 0...1.2/6 A
- Measuring input: Sinus-shaped alternating current or distorted alternating currents
- · Measuring output: Unipolar and live-zero output signals
- Housing for 35mm DIN rail mounting

#### Application



Measuring transducer for the transformation of sinus-shaped or distorted alternating currents. A load-independent DC current signal or imprinted DC voltage signal is available, which is proportionally arranged to the rms input volume. This measuring transducer fulfills the requirements and regulations with regard to the electromagnetic compatibility (EMC) and safety (IEC 1010 and EN 61010). These measuring transducers are designed for indoor use only.

### Technical data

Measuring input		Accuracy					
Rated frequency f <sub>N</sub>	50/60 Hz	Reference value	Output end value				
Rated input current I <sub>N</sub>	1 / 5 A or 1.2 / 6 A	Accuracy class	Class 0.5				
	(selectable at terminal)	Peak value factor	√2				
Consumption	≤ 1 VA	Warming-up time	≤ 5 min				
Overload capacity	1.2 · I <sub>N</sub> , constant	Operating temperature	-10 °C up to +55 °C				
	20 · I <sub>N</sub> , 1 sec.	Storage temperature	-40 °C up to +70 °C				
Measuring output		Auxiliary power					
Load-independent DC current	01 mA to 020 mA	Universal power supply	DC or AC (40400 Hz)				
	or live-zero	AC/DC ranges	2460 V or 85230 V				
	0.21 mA to 420 mA	AC power supply	4565 Hz				
Max. burden voltage	≤ 15 V	Power input	≤ 1.5 W (3 VA)				
External resistance	$R_{EXT}[k\Omega] \le 15 \text{ V} / I_{AN}[mA]$	Safety					
Current limit	approx. 1.5 x I <sub>AN</sub>	Protection class	II (protection isolated, DIN EN 61010)				
under overload		Electrocution protection	IP 40, housing				
Imprinted DC voltage	01 V to 010 V		(test wire, EN 60529)				
	or live-zero		IP 20, connection terminals				
	0.21 V to 210 V		(test digit, EN 60529)				
Load capacity	max. 2 mA	Contamination class	2				
External resistance	$R_{EXT}[k\Omega] \ge U_{AN}[V] / 2 mA$	Overvoltage category	III				
Voltage limit by R <sub>EXT</sub> = ∞	≤ 25 V	Nominal isolation voltage	300 V, input				
Current limit	≤ 10 mA	(to earth)	230 V, auxiliary power				
under overload			40 V, output				
Residual ripple of the	≤ 0.5 % p.p. (300 ms)	Test voltages	50 Hz, 1 min., EN 61010-1				
output current	≤ 2 % p.p. (50 ms)		3.7 kV, Measuring input against				
Response time	50 ms or 300 ms		all other circuits and exterior surface;				
			3.7 kV, AC auxiliary power input				
			against output and exterior surface;				
			490 V, Measuring output against				
			exterior surface				

Weight

......

250 g

EMBSIN 201 IE – Measuring transducer for AC current
effective value measuring

Features					Order	no.		
EMBSIN 201 IE, Measuring transducer for AC current								
effective value, Order no.: 201 IE - Mxx xx x	201 IE –	M	Х	Х	Х	Х	Х	+
1. Construction								-
Housing MBS for 35 mm DIN rail		м						
2. Frequecy of the input voltage / input current		101						
Rated frequency 50/60 Hz			1					
Rated frequency 400 Hz			2					
3. Measuring range			2					
01.0/5.0 A				1				
01.2/6.0 A				1				
				9				
9) A Lower / higher measuring range dependent on connection availability ! Z) Nonstandard [A] 00.1/0.5 up to 0<1.2/6 Measuring range end value ratio 1:5				9				
4. Output signal				1	I			
020 mA					1			
420 mA					2			
9) mA					9			
9 (IIA) 9) Nonstandard [mA]: 01.00 up to 0< 20 0.21 up to < (420)								
A) 010 V					A	Ì		
Z)V					Z	1		
Z) Nonstandard (V): 01.00 up to 0< 10 0,21 up to 210					ĺ			
5. Auxiliary voltage								
Auxiliary voltage U <sub>1</sub> : 85230 V AC/DC 1						1		
Auxiliary voltage U <sub>b</sub> : 2460 V AC/DC 2						2		
Auxiliary voltage from measuring input (≥ 2460 V AC )						3		
Auxiliary voltage from measuring input (≥ 85230 V AC )						4		-
Auxiliary voltage $U_{\rm h}$ : 24 V AC/2460 V DC from low voltage side						5		_
U <sub>h</sub> rated voltage Tolerances: DC –15+33 % AC –15+15 % ! 3) Not to be combinded with measuring range, order no.: C)L) ! 4) Not to be combined with measuring range, order no.: A, B, L							1	
6. Respones time								
300 ms (standard)							1	
50 ms							2	
7. Test certificates								
without test certificate								(
with test certificate in German								[
with test certificate in English								



### **EMBSIN 120 U**

Measuring transducer for alternating voltage

### Features / benefits

- Without auxiliary power supply
- Housing for 35mm DIN rail mounting
- Measuring input: Sinus-shaped alternating voltage (0...20 V to 0...500 V, arithmetical mean value measurement, effective value calibration
- Measuring output: Unipolar output signal
- Measuring principle: Rectifier process
- Economic wiring

### Application

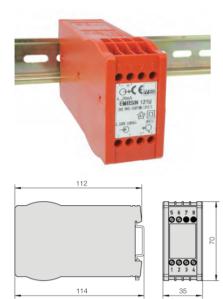
Measuring transducer for the transformation of sinus-shaped alternating voltage. A load-independent DC current signal, which is proportional to the measurement value, serves as an output signal, and allows for display, recording, monitoring and/or control functions.

This measuring transducer fulfills the requirements and regulations with regard to the electromagnetic compatibility (EMC) and safety (IEC 1010 and EN 61010). These measuring transducers are designed for indoor use only.

Technical data						
Measuring input		Accuracy				
Rated frequency f <sub>N</sub>	50/60 Hz	Reference value	Output end value			
Rated input voltage $U_N$	020 V to 0500 V	Accuracy class	Class 0.5			
	(linked voltage!)	Measuring range	20100 % U <sub>N</sub>			
	max. input voltage to	Temperature influence	0.2 % / 10 K			
	earth 300V (operating	(-10 +55 °C)				
	voltage acc. to EN 61010)	Operating temperature	-10 °C up to +55 °C			
Consumption	≤ 2 VA	Storage temperature	-40 °C up to +70 °C			
Overload capacity	$1.2 \cdot U_N$ , constant	Safety				
	2.0 · U <sub>N</sub> , 1 sec.	Protection class	II (protection isolated, DIN EN 61010)			
Measuring output		Electrocution protection	IP 40, housing			
Load-independent DC current	05 mA, 010 mA		(test wire, EN 60529)			
	or 020 mA		IP 20, connection terminals			
Max. burden voltage	≤ 15 V		(test digit, EN 60529)			
Max. burden resistance	$R_{EXT} [k\Omega] \le 15 \text{ V} / I_{AN} [mA]$	Contamination class	2			
Voltage limit by	≤ 54 V	Nominal isolation voltage	300 V, rms,			
R <sub>EXT</sub> = ∞			connection category III			
Current limit	$\leq 1.7 \cdot I_N$		500 V, rms,			
under overload			connection category II			
Residual ripple of the	≤ 1 % p.p.	Weight	180 g			
output current						
Response time	< 300 ms					

Features	Order no.						
EMBSIN 120 U, Measuring transducer for alternating voltage							
Order no.: 120 U – Mxxxx	120 U –	м	Х	Х	Х	X	
1. Construction							
Housing MBS for 35 mm DIN rail		М					
2. Measuring range			_				
0100/√₃ V			A				
0110/√3 V			В				
0120/√3 V			С				
0100 V			D				
0110 V			E				
0116.66 V			F				
0120 V			G				
0125 V			Н				
0133.33 V			J				
0150 V			K				
0250 V			L				
0400 V			М				
0500 V !			N				
Z) V			Z				
! Z) Nonstandard (V): 020 V up to 0500 V							
max. 250 V rated voltage to earth							
(Rated voltages acc. to EN 61010)							
3. Output signal							
05 mA, $R_a \leq 3 \text{ k}\Omega$				1			
010 mA, $R_{_{3}}$ % ≤ 1,5 kΩ				2			
020 mA, $R_{a} \le 750 \Omega$				3			
4. Measuring range adjustable							
Measuring range fixed					0		
Measuring end value adjustable approx. $\pm 10\%$					1		
5. Test certificates							
without test certificate						0	
with test certificate in German						D	
with test certificate in English						E	

# EMBSIN 120 U – Measuring transducer for alternating voltage, without auxiliary power supply



# **EMBSIN 121 U**

### Measuring transducer for alternating voltage

### Features / benefits

- With auxiliary power supply
- Optional with measuring output 4...20 mA and/or 2-wire technic
- Housing for 35mm DIN rail mounting
- Measuring input: Sinus-shaped alternating voltage, arithmetical mean value measurement, effective value calibration
- · Measuring output: Unipolar and live-zero output signals
- Measuring principle: Rectifier process

**Technical data** 

• AC or DC auxiliary power supply

### Application

Measuring transducer for the transformation of sinus-shaped alternating voltage. A load-independent DC current signal or imprinted DC voltage signal is available, which stands proportionally to the measurement value of the input volume. This measuring transducer fulfills the requirements and regulations with regard to the electromagnetic compatibility (EMC) and safety (IEC 1010 and EN 61010). These measuring transducers are designed for indoor use only.

Measuring input		Current limit	< 30 mA
Rated frequency f <sub>N</sub>	50/60 Hz	under overload	
Rated input voltage U <sub>N</sub>	050 V to 0600 V	Residual ripple of the	≤ 1 % p.p.
	(linked voltage!)	output current	
	max. input voltage to	Response time	< 300 ms
	earth 300V (operating	Accuracy	
	voltage acc. to EN 61010)	Reference value	Output end value
Consumption	< U <sub>N</sub> · 50µA (U <sub>N</sub> ≤ 150 V)	Accuracy class	Class 0.5 (U <sub>N</sub> ≤ 500 V)
	< U <sub>N</sub> · 20µA (150 < U <sub>N</sub> ≤ 400V)		Class 1 (U <sub>N</sub> > 500 V)
	< U <sub>N</sub> · 5 µA (400 < U <sub>N</sub> ≤ 600V)	Operating temperature	-10 °C up to +55 °C
Overload capacity	$1.2 \cdot U_N$ , constant	Auxiliary power	
	2.0 · U <sub>N</sub> , 1 sec.	AC	24…400 V (±15 %, 50/60 Hz)
Measuring output			P <sub>V</sub> approx. 3 VA
Load-independent DC	05 mA to 020 mA	DC	24 V, -15 / +33 % or
current	or live-zero		24 V, -50 / +33 %
	15 mA to 420 mA		by 2-wire feed and output
Max. burden voltage	≤ 15 V		420 mA; P <sub>V</sub> approx. 1.5 W
Max. burden resistance	R <sub>EXT</sub> [kΩ] ≤ 15 V / I <sub>AN</sub> [mA]	Universal power supply	2460 V AC/DC
By 2-wire connection	standard range 420 mA	(AC + DC)	DC -15 / + 33 %
	External resistance R <sub>EXT</sub> ,		Power consumption $P_V \le 1.5 W$
	dependent of the auxiliary		AC ±15 %
	power H (1232 V DC)		Power consumption $P_V \leq 3 VA$
	$R_{EXT}[k\Omega] \le (H-12)V / 20mA$	Safety	
Current limit	< 30 mA	Protection class	II (protection isolated, DIN EN 61010)
under overload		Electrocution protection	IP 40, housing
Voltage limit by	≤ 40 V		(test wire, EN 60529)
R <sub>EXT</sub> = ∞			IP 20, connection terminals
Residual ripple of the	≤ 1 % p.p.		(test digit, EN 60529)
output current		Contamination class	2
Imprinted DC voltage	05 V to 010 V	Overvoltage category	
	or live-zero	Nominal isolation voltage	300 V, input
	15 V to 210 V	(to earth)	300 V, auxiliary power AC
Min. burden resistance	$R_{EXT}[k\Omega] \le U_{AN}[V] / 10 \text{ mA}$		50 V, auxiliary power 24 V DC
Voltage limit by	≤ 40 V		50 V, output
R <sub>EXT</sub> = ∞		Weight	195 g

# EMBSIN 121 U – Measuring transducer for alternating voltage

Features	Order no.						
MBSIN 121 U, Measuring transducer for alternating voltage							
Order no.: 121 U – Mxx xx	101 I –	М	Х	Х		X	X
1. Construction							
Housing MBS for 35 mm DIN rail		м					
2. Frequency of the input volt			1				
Rated frequency 50/60 Hz							
3. Measuring range	I			1			
0100 V				Α			-
0250 V				B			
0500 V				C			
Z) V				-			
2) Nonstandard (V) 050 bis 0500				Z			
Max. 300 V rated voltage to earth							
(Rated voltages acc. to EN 61010)					1		
4. Output signal				1			
			-		1	1	
020 mA 420 mA					1	-	
420 mA, 2-wire-connection / feed					3		
9) mA					9		
9) Nonstandard [mA] 02.5 up to 0< 20							
15 up to < (4 20)							
010 V 15 up to 210					A	ļ	_
Z) V					Z		
! Z) Nonstandard (V) 05.0 up to 0< 10							
5. Auxiliary voltage							
Auxiliary voltage $U_{\rm h}$ : 24 V AC						1	
Auxiliary voltage U: 110 V AC						2	
Auxiliary voltage $U_{i}$ : 115 V AC						3	
Auxiliary voltage U: 120 V AC						4	
Auxiliary voltage U: 230 V AC						5	
Auxiliary voltage U <sub>b</sub> : 400 V AC, ! max. 300 V to earth!		-			-	6	
Auxiliary voltage $U_1$ : 24 V DC						A	
Auxiliary voltage $U_h$ : 24 V DC via output circuit						B	
Auxiliary voltage $U_h$ : 85230 V AC/DC						C	
Auxiliary voltage $U_h$ : 2460 V AC/DC						D	
· · · ·							
U <sub>h</sub> rated voltage							
permissible tolerances for AC -15+33%							
permissible tolerances for DC -15+15%							
permissible tolerances for DC via output circuit -50+33%							
1) to A) not to be combined with output signal, order no.: 3)							
! B)         not to be combined with output signal,							
order no.: 1), 2), 9), A), Z)			-				
6. Test certificates							
without test certificate							0
with test certificate in German							D
with test certificate in English							E



# MT 440

Programmable measuring transducer for all electrical parameters

### Features / benefits

- With auxiliary voltage supply by means of an integrated AC/DC universal power supply
- Housing for 35mm DIN rail mounting
- Monitoring of up to 50 different parameters (V, A, kW, kVA, ...)
- Multifunctional measuring transducer with 4 freely programmable measuring outputs
- Measuring outputs can be set as analogue output, impulse output, relay output or control output
- By default with USB 2.0 interface (not galvanically isolated!)
- Optionally with additional serial interface RS232 or RS485
- Communication protocol: MODBUS RTU
- Automatic selection of current and voltage inputs
- Easy parameter setting due to user-friendly setting software, which forms the delivery
- Measuring frequency: 50/60 Hz or 400 Hz

### Application

The programmable measuring transducer MT 440 enables to capture up to 50 different electrical parameters of the connected network.

Large input ranges of the input volumes allow for the monitoring of almost all standardized electrical parameters.

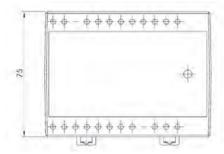
Four integrated, freely programmable measuring outputs permit the simultaneous use of the assigned measuring value for control and monitoring purposes.

### Supported measurements

	Basic measurements					
	Voltage $U_1$ , $U_2$ , $U_3$ and $U^{\sim}$					
	Current I <sub>1</sub> , I <sub>2</sub> , I <sub>3</sub> , I <sub>n</sub> , I <sub>t</sub> and I <sub>a</sub>					
	Active power $P_1$ , $P_2$ , $P_3$ and $P_t$					
	Re-active power Q <sub>1</sub> , Q <sub>2</sub> , Q <sub>3</sub> and Q <sub>t</sub>					
Phase	Apparent power S <sub>1</sub> , S <sub>2</sub> , S <sub>3</sub> and S <sub>t</sub>					
	Power factor $PF_1$ , $PF_2$ , $PF_3$ and $PF^{\sim}$					
	Phase angle $\varphi_1$ , $\varphi_2$ , $\varphi_3$ , and $\varphi^{}$					
	THD of phase voltage Uf1, Uf2 and Uf3					
	THD of phase angle $I_1$ , $I_2$ and $I_3$					
	Phase-to-phase voltage U <sub>12</sub> , U <sub>23</sub> , U <sub>31</sub>					
Dhase to phase	Average phase-to-phase voltage U <sub>ff</sub>					
Phase-to-phase	Phase-to-phase angle) $\phi_{12}$ , $\phi_{23}$ , $\phi_{31}$					
	THD of phase-to-phase voltage					
	Counter 1					
	Counter 2					
Energy	Counter 3					
	Counter 4					
	Active tariff					
	Other measurements					
	Phase current I <sub>1</sub> , I <sub>2</sub> , I <sub>3</sub>					
	Active power P (positive)					
MD values	Active power P (negative)					
wid values	Re-active power Q – L					
	Re-active power Q – C					
	Apparent power S					
Magaziramanta	Frequency					
Measurements	Internal temperature					







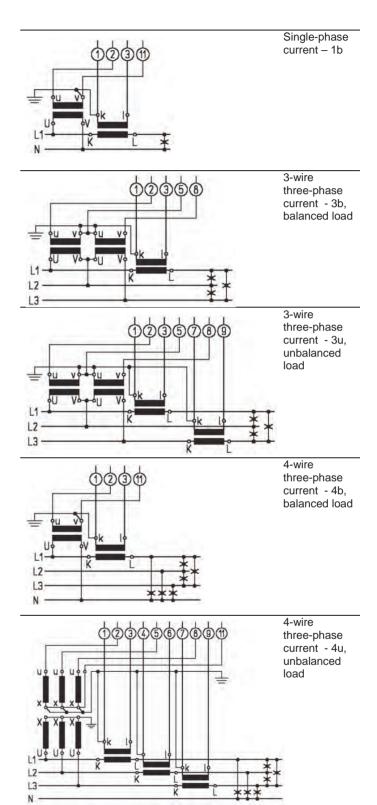
	Тес	Defense in 199	
Measuring input	500.1/	Reference conditions	
Rated input voltage $U_N$	500 V	Ambient temperature	1530 °C
	(phase against neutral)	Input signal	0100 % I <sub>N</sub>
	Automatic selection of the	Frequency	4565 Hz
N/ 10	measuring range	Connection terminals	
Voltage measuring range	62,5 V, 125 V, 250 V, 500 V	Screw terminals	2.5 mm <sup>2</sup> , wire with ferrule
Rated input current I <sub>N</sub>	5 A		4.0 mm <sup>2</sup> , solid conductor
Current measuring range	1 A, 5 A, 10 A	Setting software	MiQen
Overload capacity			Software for communication and
Current input	15 A constant,		parameterization of transducer
(acc. IEC 60688)	20 x I <sub>N</sub> , 5 x 1 sec.	Interfaces (optionally)	RS232 resp. RS485
Voltage input	600 V constant,	Operating conditions	
(acc. IEC 60688)	2 x U <sub>N</sub> , 10 sec.	Ambient temperature	-10 <u>0 45</u> 55 °C
Measuring output		Operating temperature	-30 + 70 °C
DC current outputs		Storage temperature	-40 + 70 °C
4 output ranges,	-100 % 0 100 %	Average annual humidity	≤ 93 %
programmable	-(120)mA0 (120)mA	Altitude	≤ 2000 m
Control range	±120% I <sub>AN</sub>	Safety	
Max. burden voltage	≤ 10 V	Electrocution protection	IP 40
Max. output current at	35 mA		(IP 20 for connection terminals)
overload		Contamination class	2
Max. output voltage at open	35 V	Installation category	CAT III; 600 V, measuring inputs
current output		(EN 61010-1)	CAT III; 300 V, auxiliary voltage
Max. burden resistance	R <sub>max</sub> [kΩ] = 10 V / I <sub>AN</sub> [mA]		Input
Response time	≤ 50 ms (Analog FAST)	Test voltages	3320 V AC <sub>RMS</sub> , Auxiliary power
Residual ripple of the	≤ 1 % p.p.	(DIN 57411)	against input / output / interface
output current	k.k.	(2)	$3320 \text{ V AC}_{\text{RMS}}$ , Auxiliary power
DC voltage outputs			against current input / voltage
2 output ranges,	-100 % 0 100 %		Input
programmable	-(110) V0 (110) V		3320 V AC <sub>RMS</sub> current input against
Control range	±120%		voltage input
Max. output voltage at	120 % nominal	Housing material	PC / ABS / UL 94 V-0
overload		Standards	EN 61010-1; 2001
Max. output current	20 mA	Clandardo	EN 60688; 1995 / A2; 2001
Min. burden resistance	$R_{BMIN}$ [kΩ] ≥ U <sub>AN</sub> / 20 mA		EN 61326-1; 2006
	$\leq 50 \text{ ms} (\text{Analog FAST})$		EN 60529; 1997 / A1; 2000
Response time Residual ripple of the	$\leq 1 \% \text{ p.p.}$		EN 60068-2-1/ -2/ -6/ -27/ -30
	= ι /o μ.μ.	Dimensions (B x H x T)	100 x 105 x 75 mm
output voltage Accuracy			
		Weight	370 g
IEC 60688	Class 0.5		
Auxiliary power			
Universal power supply	AC 40276 V, (4565 Hz)		
	DC 24300 V		

# MT 440

Programmable measuring transducer for all electrical parameters

### **Connection diagram**

The voltage inputs of the measuring transducer can be connected directly to a low-voltage network or to a highvoltage network via a high-voltage transformer. The current inputs of the measuring transducer can be directly connected to a low-voltage network via a lowvoltage current transformer or to a high-voltage network via a high-voltage current transformer.



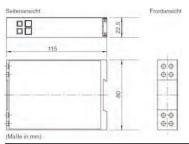
Function			Connection
		I <sub>L1</sub>	1/3
	AC current	I <sub>L2</sub>	4/6
Moocuring		I <sub>L3</sub>	7/9
Measuring input		U <sub>L1</sub>	2
input	AC voltage	U <sub>L2</sub>	5
	AC voltage	U <sub>L3</sub>	8
		N	11
	Output 1	ω+	15
	Output 1	ωθ	16
	Output 2	ω+	17
Measuring	Output 2	ω θ	18
outputs	Output 3	ω+	19
	Output 0	ωθ	20
	Output 4	ω+	21
	Output 4	ωθ	22
Auxiliary volt		+ / AC (L)	13
Auxiliary voi		- / AC (N)	14
	RS232 /	R <sub>X</sub> A	23
Interface	RS485	GND / NC <sup>1)</sup>	24
	110-00	T <sub>X</sub> / B	25

<sup>1)</sup> -NC- do not connect

Features		Order no.						
MT 440, programmable measuring transducer								
all eletrical values								
Order no.: 440 – xxxxxxx	440 –	X	Х	Х	Х	Х	Х	X
1. Auxiliary voltage								
Universal (40276 V AC, 4565 Hz; 24300 V DC), 8 VA		1						
2. Rated input frequency					-			
Rated frequency 50/60 Hz			1					
Rated frequency 400 Hz			2					
3. Communication type								
without				0				
RS232				1				
RS485				2				
4. Output 1								
without					0			
analogue (< 100 ms)					1			
fast analogue (< 50 ms)					2			
solid state relay					3			
electromechanical relay					4			
5. Output 2								
without						0		
analogue (< 100 ms)						1		
fast analogue (< 50 ms)						2		
solid state relay						3		
electromechanical relay						4		
6. Output 3								
without							0	
analogue (< 100 ms)							1	
fast analogue (< 50 ms)							2	
solid state relay							3	
electromechanical relay							4	
7. Output 4								
without								0
analogue (< 100 ms)								1
fast analogue (< 50 ms)								2
solid state relay								3
electromechanical relay								4

### MT 440 – Programmable measuring transducer for all electrical values





# **MA-1.1s**

Measuring transducer for alternating current (sinusoidal)

### Characteristics/uses

- Measuring output 0(4) ... 20 mA, 0(2) ... 10 V .
- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715
- Measuring input: Sinusoidal alternating current .
- Measurement output: Unipolar and live-zero output variables
- Standard current inputs 1 A and 5 A with output 0 ... 20 mA without auxiliary voltage •

### Application

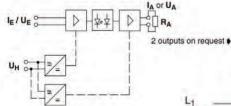
The measuring transducers convert currents into an load-independent DC current or an imprinted DC voltage with the correct sign. These can then be displayed, registered and/or used for control at the measurement location or in more distant control rooms.

### **Functional principle**

The current is measured internally via a shunt resistor, after which the signal is galvanically isolated from the input via an optical path and converted into a proportional imprinted DC voltage or a proportional load-independent DC current.

	Teo	chnical parameters	
Measuring input		Nominal conditions	
Nominal frequency fn	4862 Hz	Auxiliary voltage	Uн∾ ±5% (50 Hz with AC)
Nominal input current IN	200 μA – 5 A	Load	0.5 RAmax. ±1% with current output
Intrinsic consumption	IE • 0.1 V		R <sub>A</sub> min ±1% with voltage output
Overload capacity	1.2 · IEN, permanent	Frequency	5060 Hz
	10 · IEN, max. 1 sec.	Waveform	Sine, distortion factor ≤ 0.1%
Operating voltage	max. 519 V AC,	Ambient temperature	23°C ±1K
	max. 300V phase zero	Warm-up time	≥5 min
Measurement output		Auxiliary energy	
Nominal current IAN	0 20 mA or 4 20 mA	AC voltage	230 V~ (-15% +10%); < 6 VA
Load range RA	0 12 V / Ian		115 V~ (-15% +10%); < 3.5 VA
Current limitation	to 120 150% of the final value	DC voltage	24 V = (20 72V); < 3 VA
Nominal voltage UAN	0 10 V or 2 10 V	Wide range	20 100 V= or 15 70V~; < 3 VA
Load RA	≥ 4 kΩ	AC / DC	90 357 V= or 65 253V~; < 3 6 VA
Load error	≤ 0.1% at 50% load change	General technical data	
Residual ripple	≤ 1%eff	Test voltage	2210 V all circuits against housing
Setting time	approx. 500ms, 250ms, 100ms		3536 V all circuits to each other
Open-circuit voltage	≤ 15 V	Working voltage	300 V (nominal mains voltage phase-zero)
Accuracy		Protection class	IP 40 housing, IP 20 terminals
Basic accuracy	± 0.5% of the final value	Protection class	II
Temperature drift	≤ 0.01 %/K	Measurement category	CAT III
	20.048	Degree of contamination	2
	IA or UA	Weight	approx 120 g

Weight

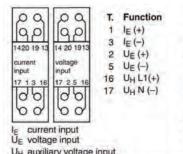


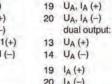
Block circuit diagram

(3) Connections  $(\mathbf{f})$ L L  $N(L_2)$ N L  $N(L_2)$ N with transformer

### Terminal assignment

approx. 120 g





Τ.

- 20 IA (-)
- current output IA UA

Function

single output:

voltage output

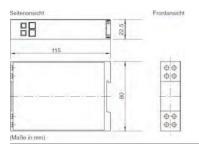
U<sub>H</sub> auxiliary voltage input

The terminal numbering correspond to details in the connection diagrams (to DIN 43 807).

# MA-1.1s – Measuring transducer for alternating current (sinusoidal)

Characteristics	Order number								
MA-1.1s, measuring transducer for sinusoidal alternating current									
Order No. IMU02 - xxxxxx	IMU	02 –	х	х	х	х	х	х	х
1. Nominal input current									
0 200 μΑ			1						
0 20 mA			2						
0 0.5 A			3						
01A			4						
02A			5						
05A			6						
Special range up to 5 A			9						
2. Frequency range input		•	1		1	1	1	1	1
15 18 Hz ( 16 2/3 Hz)	[			1	1				
48 62 Hz ( 50/60 Hz )				2					
98 102 Hz ( 100 Hz )				3					
380 420 Hz ( 400 Hz )				4					
Special frequency				9					
3. Output									
0 20 mA	[				1	Γ			
4 20 mA					2				
0 10 V					3				
2 10 V					4				
0 20 mA and 0 10 V					5				
4 20 mA and 2 10 V					6				
Special ranges					9				
0 10 mA					Α				
0 5 mA					В				
-20 0 20 mA					С				
-10 0 10 V					D				
-20 0 20 mA and -10 0 10 V					E				
according to specification					Z				
4. Accuracy					1	1			
± 0.5% of the final value						1			
5. Setting time						1	1		
500 ms							1		
250 ms							2		
100 ms							3		
6. Auxiliary <b>power supply</b>									
AC 230 V (195 253 V), (48 62 Hz)	[							1	
AC 115 V (98 126 V), (48 62 Hz)								2	
DC 24 V (20 72 V)								3	
DC 20 100 V / AC 15 70 V								4	
DC 90 357 V / AC 65 253 V								5	
without auxiliary energy with input 0 1 A / 0 5 A and output 0 20 mA								6	
7. Test reports									
without test report									0
with test report German English									1
	I								





# MA-1.1s (eff)

Measuring transducer for non-sinusoidal alternating current (true effective value)

### Characteristics/uses

- Measuring output 0(4) ... 20 mA, 0(2) ... 10 V
- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715
- Measuring input: non-sinusoidal alternating current
- Measurement output: Unipolar and live-zero output variables
- True effective value measurement

### Application:

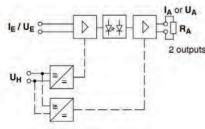
The measuring transducers convert currents into a load-independent DC current or an imprinted DC voltage with the correct sign. These can then be displayed, registered and/or used for control at the measurement location or in more distant control rooms.

### **Functional principle**

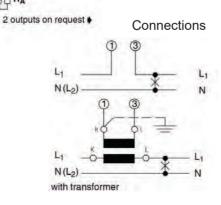
The current is measured internally via a shunt resistor. After this, the signal is galvanically isolated from the input via an optical path and converted into a proportional imprinted DC voltage or a proportional load-independent DC current.

Measuring input		Nominal conditions	
Nominal frequency fN	4862 Hz	Auxiliary voltage	Uнм ±5% (50 Hz with AC)
Nominal input current IN	Ien = 200 μA - 5 A	Load	0.5 RA max. ±1% with current output
Intrinsic consumption	IE · 0.1 V		$R_A min \pm 1\%$ with voltage output
Overload capacity	1.2 · IN, permanent	Frequency	5060 Hz
	10 · IN, max. 1 sec.	Waveform	Non-sine, crest factor ≤ 4
Operating voltage	max. 519 V AC,	Ambient temperature	23°C ±1K
	max. 300V phase zero	Warm-up time	≥5 min
Measurement output		Auxiliary power supply	
Nominal current IAN	0 20 mA or 4 20 mA	AC voltage	230 V~ (-15% +10%); < 6 VA
Load range RA	0 12 V / Ian		115 V~ (-15% +10%); < 3.5 VA
Current limitation	to 120 150% of the final value	DC voltage	24 V = (20 72V); < 3 VA
Nominal voltage UAN	0 10 V or 2 10 V	Wide range	20 100 V= or 15 70V~; < 3 VA
Load RA	≥ 4 kΩ	AC / DC	90 357 V= or 65 253V~; < 3 6 VA
Load error	≤ 0.1% at 50% load change	General technical data	
Residual ripple	≤ 1%eff	Test voltage	2210 V all circuits against housing
Setting time	approx. 500ms		3536 V all circuits to each other
Open-circuit voltage	≤ 15 V	Working voltage	300 V (nominal mains voltage phase-zero)
Accuracy		Protection class	IP 40 housing, IP 20 terminals
Basic accuracy	± 0.5% of the final value	Protection class	II
Temperature drift	≤ 0.01 %/K	Measurement category	CAT III
		Degree of contamination	2

Weight



Block circuit diagram



### Terminal assignment

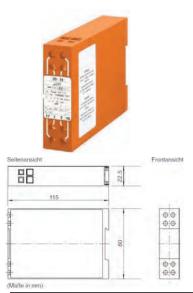
approx. 120 g

09	Т.	Function	Τ.	Function
	1	IE (+)		single output:
14 20 1013	3	1E(-)	19	UA, IA (+)
1.000	2	UE (+)	20	UA, IA (-)
	5	UE ()		dual output:
	16	U <sub>H</sub> L1(+)	13	UA (+)
1251	17	U <sub>H</sub> N (-)	14	UA (-)
621			19	IA (+)
00			20	IA (-)
nt input ge input				current output voltage output
		2 input 17 2 5 16 0 17 17 16 17 17 17 17 17	1 IE (+) 14 20 1913 voltage input 17 25 16 16 UH L1(+) 17 UH N (-) 17 UH N (-)	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$

in the connection diagrams (to DIN 43 807).

# MA-1.1s (eff) - Transducer for non-sinusoidal alternating current (true effective value)

Characteristics		Order number							
MA-1.1s (eff), transducer for non-sinusoidal									
alternating current									
Order No. IMU04 - xxxxxx	IMU	04 -	Х	Х	Х	Х	Х	Х	Х
1 Nominal input current									
0 200 μΑ			1						
0 20 mA			2						
0 0.5 A			3						
0 1 A			4						
0 2 A			5						
0 5 A			6						
Special range up to 5 A			9						
2 Frequency range input									
15 18 Hz ( 16 2/3 Hz )				1					
48 62 Hz ( 50/60 Hz )				2					
98 102 Hz ( 100 Hz )				3					
380 420 Hz ( 400 Hz )				4					
Special frequency				5					
3.Output									
0 20 mA					1				
4 20 mA					2				
0 10 V					3				
2 10 V					4				
0 20 mA and 0 10 V					5				
4 20 mA and 2 10 V					6				
Special ranges					9				
0 10 mA					Α				
0 5 mA					В				
-20 0 20 mA					С				
-10 0 10 V					D				
-20 0 20 mA and -10 0 10 V					E				
according to specification					Z				
4 Accuracy									
± 0.5% of the final value						1			
5 Setting time	•					•			
500 ms							1		
6. Auxiliary power supply									
AC 230 V (195 253 V), (48 62 Hz)								1	
AC 115 V (98 126 V), (48 62 Hz)								2	
DC 24 V (20 72 V)								3	
DC 20 100 V / AC 15 70 V								4	
DC 90 357 V / AC 65 253 V								5	
7 Test reports									
without test report									0
with test report German_English									1



# MV-1.1s

Measuring transducer for AC voltage (sinusoidal)

### Characteristics/uses

- Measuring output 0(4) ... 20 mA, 0(2) ... 10 V
- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715
- Measuring input: Sinusoidal alternating voltage
- Measurement output: Unipolar and live-zero output variables
- Standard voltage inputs with output 0 ... 20 mA without auxiliary voltage (according to order list)

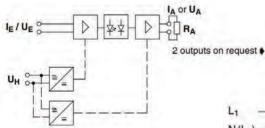
### Application

The measuring transducers convert voltages into an load-independent DC current or an imprinted DC voltage with the correct sign. These can then be displayed, registered and/or used for control at the measurement location or in more distant control rooms.

### **Functional principle**

The voltage is measured internally via a voltage divider. After this, the signal is galvanically isolated from the input via an optical path and converted into a proportional imprinted DC voltage or a proportional load-independent DC current.

	Technical	parameters	
Measuring input		Nominal conditions	
Nominal frequency fN	4862 Hz	Auxiliary voltage	U <sub>HN</sub> ±5% (50 Hz for AC)
Nominal input voltage UEN	U <sub>EN</sub> = 60 mV - 519 V	Load	0.5 $R_A$ max. ±1% for current output
Intrinsic consumption $I_E$ ·	0.1 V	R <sub>A</sub> min ±1% for voltage c	putput
Overload capacity	1.2 · U <sub>EN</sub> , permanent	Frequency	50 60 Hz
	2 U <sub>EN</sub> , max. 1 sec.	Waveform	sinus, distortion factor ≤ 0.1%
Operating voltage	max. 519 V AC,	Ambient temperature	23 °C ± 1 K
	max. 300 V phase zero	Warm-up time	≥5 min
Measuring output		Auxiliary power supply	
Nominal current IAN	0 20 mA or 4 20 mA	_AC voltage	230 V~ (-15% +10%); < 6 VA
Load range R <sub>A</sub>	0 12 V / IAN		115 V~ (-15% +10%); < 3.5 VA
Current limitation	to 120 150% of final value	DC voltage	24 V= (20 72V); < 3 VA
Nominal voltage UAN	0 10 V or 2 10 V	Wide range	20 100 V= or 15 70V~; < 3 VA
Load RA	≥ 4 kΩ		AC / DC 90 357 V= or 65 253V~; < 3 6 VA
Load error	≤ 0.1% at 50% load change	General technical data	
Residual ripple	≤ 1%eff	Test voltage	2210 V all circuits against housing
Setting time	approx. 500ms, opt. 250ms or 100ms		3536 V all circuits to each other
Open-circuit voltage	≤ 15 V	Working voltage	300 V (nominal mains voltage phase-zero)
Accuracy		Protection class	IP 40 housing, IP 20 terminals
Basic accuracy	± 0.5% of the final value	Protection class	11
Temperature drift	≤ 0.01 %/K	Measurement category	CAT III
		Degree of	2

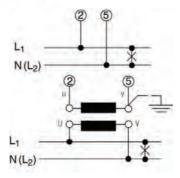


Block circuit diagram

Connections

Weight

contamination



### Terminal assignment

approx. 120 g

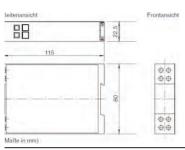
NUL	Т.	Function	Т.	Function
aol	1	IE (+)		single output:
4 20 1912	3	IE (-)	19	UA, IA (+)
	2	UE (+)	20	UA, IA (-)
	5	UE (-)		dual output:
	16	U <sub>H</sub> L1(+)	13	U <sub>A</sub> (+)
สี่ที่ไ	17	U <sub>H</sub> N (–)	14	U <sub>A</sub> (-)
621			19	IA (+)
00			20	IA (-)
input input			IA UA	current output voltage output
	input	1 4 20 1913 voltage nput 17 2 5 16 0 0 0 0 0 0 0 0 17 16 17 17 16 17 17 17 17 16 17 17 17 17 16 17 17 16 17 17 16 17 17 16 16 17 17 16 16 17 17 16 16 17 17 16 16 17 17 16 16 16 17 16 16 16 17 17 16 16 16 17 17 16 16 17 16 16 17 17 16 16 17 16 16 17 17 16 16 17 17 16 16 17 17 16 16 17 17 16 17 16 17 17 16 17 17 16 17 17 16 17 17 16 17 17 17 16 17 17 16 17 17 17 17 17 16 17 17 17 17 17 16 17 17 17 17 16 17 17 17 17 17 17 17 17 17 17	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $

The terminal numbering correspond to details in the connection diagrams (to DIN 43 807).

# MV-1.1s – Measuring transducer for AC voltage (sinusoidal)

Characteristics					rder nu	mher			
MV-1.1s, measuring transducer for sinusoidal AC voltage							1	1	1
Order No. UMU05 - xxxxxx	UMU	05 –	х	х	х	х	x	х	х
1. Input voltage	01110	05	~	~	~	~	~	~	~
0 60 mV	-		1						
01V			2						
0 1 V			3						
0 115 V			4						
0 230 V			5						
0 400 V			6						
Special range up to 519 V AC, up to 300 V DC			9						
2. Frequency range input			5				1		1
15 18 Hz ( 16 2/3 Hz )				1	r				
48 62 Hz ( 50/60 Hz )				2					
98 102 Hz ( 100 Hz )				3					
380 420 Hz ( 400 Hz )				4					
Special frequency				4					
3. Output				5					
	-					1			
0 20 mA	_				1				
4 20 mA					2				
0 10 V	_				3				
2 10 V					4				
0 20 mA and 0 10 V	_				5				
4 20 mA and 2 10 V					6				
Special ranges					9				
0 10 mA					A				
0 5 mA					В				
-20 0 20 mA					С				
-10 0 10 V					D				
-20 0 20 mA and -10 0 10 V					E				
according to specification					Z				
4. Accuracy									
± 0.5% of the final value						1			
5. Setting time									
500 ms							1		
250 ms							2		
100 ms							3		
6. Auxiliary <b>power supply</b>									
AC 230 V (195 253 V), (48 62 Hz)								1	
AC 115 V (98 126 V), (48 62 Hz)								2	
DC 24 V (20 72 V)								3	
DC 20 100 V / AC 15 70 V								4	
DC 90 357 V / AC 65 253 V								5	
7. Test reports	1								
	1								1
without test report								0	





# MV-1.1s (eff)

Measuring transducer for non-sinusoidal alternating voltage (true effective value)

### Characteristics/uses

- Measuring output 0(4) ... 20 mA, 0(2) ... 10 V
- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715
- Measuring input: non-sinusoidal AC voltage
- Measurement output: Unipolar and live-zero output variables

### Application

The measuring transducers convert voltages into an load-independent DC current or an imprinted DC voltage with the correct sign. These can then be displayed, registered and/or used for control at the measurement location or in more distant control rooms.

### **Functional principle**

The voltage is measured internally via a voltage divider. After this, the signal is galvanically isolated from the input via an optical path and converted into a proportional imprinted DC voltage or a proportional load-independent DC current.

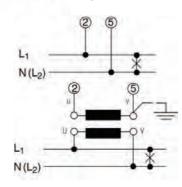
	Те	echnical parameters	
Measuring input		Nominal conditions	
Nominal frequency fN	4862 Hz	Auxiliary voltage	Uнм ±5% (50 Hz with AC)
Input voltage UEN	Uen = 60 mV - 519 V	Load	0.5 RA max. ±1% with current output
Intrinsic consumption	IE • 0.1 V	_	R <sub>A</sub> min ±1% with voltage output
Overload capacity	1.2 · UEN, permanent	Frequency	5060 Hz
	2 · UEN, max. 1 sec.	Waveform	Non-sine, crest factor ≤ 4
Operating voltage	max. 519 V AC,	Ambient temperature	23°C ±1K
	max. 300V phase zero	Warm-up time	≥5 min
Measurement output		Auxiliary power supply	
Nominal current IAN	0 20 mA or 4 20 mA	AC voltage	230 V~ (-15% +10%); < 6 VA
Load range RA	0 12 V / IAN	_	115 V~ (-15% +10%); < 3.5 VA
Current limitation	to 120 150% of the final value	DC voltage	24 V = (20 72V); < 3 VA
Nominal voltage UAN	0 10 V or 2 10 V	Wide range	20 100 V= or 15 70V~; < 3 VA
Load RA	≥ 4 kΩ	AC / DC	90 357 V= or 65 253V~; < 3 6 VA
Load error	≤ 0.1% at 50% load change	General technical data	
Residual ripple	≤ 1%eff	Test voltage	2210 V all circuits against housing
Setting time	approx. 500ms	_	3536 V all circuits to each other
Open-circuit voltage	≤ 15 V	Working voltage	300 V (nominal mains voltage phase-zero)
Accuracy		Protection class	IP 40 housing, IP 20 terminals
Basic accuracy	± 0.5% of the final value	Protection class	II
Temperature drift	≤ 0.01 %/K	Measurement category	CAT III
		Degree of contamination	2

 $I_E / U_E$ 

Block circuit diagram (example)



Weight



# Terminal assignment (for all types)

approx. 120 g

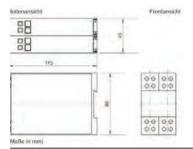
	1 1	E (+)		Function single output:
		E (-)	19	UA, IA (+)
420 19 13 14 20 1913 urrent voltage input input	2 L	J <sub>E</sub> (+) J <sub>E</sub> (-)	20	U <sub>A</sub> , I <sub>A</sub> (-) dual output:
7 1 3 16 17 2 5 16	16 L	J <sub>H</sub> L1(+)	13	U <sub>A</sub> (+)
261261	17 L	J <sub>H</sub> N (–)	14	U <sub>A</sub> (-)
			19	IA (+)
00[00]			20	I <sub>A</sub> (-)
E voltage input			IA UA	current output voltage output
H auxiliary voltage	input			

# MV-1.1s (eff) – Measuring transducer for non-sinusoidal AC voltage

# (true effective value)

Characteristics				Or	rder nu	mber			
MV-1.1s (eff), measuring transducer for non-sinusoidal						[	T	1	
AC voltage									
Order No. UMU07 - xxxxxx	UMU	07 –	х	х	х	х	х	х	х
1. Input voltage									
0 60 mV			1						
01V			2						
0 10 V			3			-	1		
0 115 V			4						
0 230 V			5						
0 400 V			6						
Special range up to 519 V AC, up to 300 V DC			9						
2. Frequency range input	<u> </u>								l
15 18 Hz ( 16 2/3 Hz )	1			1	1				
48 62 Hz ( 50/60 Hz )				2					
98 102 Hz ( 100 Hz )				2					
380 420 Hz ( 400 Hz )				3 4					
Special frequency									
				5					
3. Output 0 20 mA	1					r			
4 20 mA					1				
					2				
010V					3				
2 10 V	-				4				
0 20 mA and 0 10 V	_				5				
4 20 mA and 2 10 V					6				
Special ranges					9				
0 10 mA					A				
0 5 mA					В				
-20 0 20 mA					С				
-10 0 10 V					D				
-20 0 20 mA and -10 0 10 V					E				
according to specification					Z				
4. Accuracy									
± 0.5% of the final value						1			
5. Setting time									
500 ms							1		
6. Auxiliary power supply									
AC 230 V (195 253 V), (48 62 Hz)								1	
AC 115 V (98 126 V), (48 62 Hz)								2	
DC 24 V (20 72 V)								3	
DC 20 100 V / AC 15 70 V								4	
DC 90 357 V / AC 65 253 V								5	
7. Test reports									
without test report									0
with test report German_English									1





# **MF-1.1**

Measuring transducer for frequency

### Characteristics/uses

- Measuring output 0(4) ... 20 mA, 0(2) ... 10 V •
- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715 .
- Measuring input: Alternating voltages sinusoidal, ≥ 14 Hz ≤ 500 Hz
- Measurement output: Unipolar and live-zero output variables •

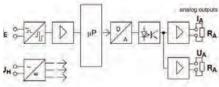
### Application

MF-1.1 measuring transducers using microprocessor technology detect the frequency of the input signal and then convert it into load-independent DC current and imprinted DC voltage signals. These can then be displayed, registered and/or used for control at the measurement location or in more distant control rooms.

### **Functional principle**

The input AC voltage is converted into a square wave signal and then fed to and analysed by a microprocessor. Via a D/A converter and an opto-coupler for galvanic isolation, the signal reaches the output stages, which provide an load-independent DC current and a synchronous imprinted DC voltage proportional to the frequency applied to the input.

	Tecl	hnical parameters	
Veasuring input		Nominal conditions	
Nominal frequency fE	f <sub>Emin</sub> ≥ 14 Hz	Auxiliary voltage	Uнм ±1%, 48 62 Hz
	f <sub>Emax</sub> ≤ 500 Hz	Voltage	Uen ±1%
nput voltage UEN	$U_{EN} = 100 \text{ V} - 519 \text{ V}$	Frequency	fN
ntrinsic consumption	3 7 VA	Waveform	Sine, distortion factor ≤ 0.1%
Overload capacity	1.2 · UEN, permanent	Ambient temperature	23°C ±1K
	2 · UEN, max. 1 sec.	Warm-up time	≥5 min
Operating voltage	max. 519 V AC,	Auxiliary power supply	
	max. 300 V phase zero	AC voltage	230 V~ (-15% +10%); < 7 VA
Veasurement output		-	115 V~ (-15% +10%); < 4 VA
Nominal current IAN	0 20 mA or 4 20 mA	DC voltage	24 V = (20 72V); < 3 VA
Load range RA	0 10 V / Ian	Wide range	20 100 V= or 15 70V~; < 3 VA
Current limitation	to 120 150% of the final value	AC / DC	90 357 V= or 65 253V~; < 4 7 VA
Nominal voltage UAN	0 10 V or 2 10 V	General technical data	
Load RA	≥ 4 kΩ	Test voltage	2210 V all circuits against housing
_oad error	≤ 0.1% at 50% load change	-	3536 V measuring circuit and auxiliary voltage
Residual ripple	≤ 1%eff	-	against output
Setting time	approx. 500ms	-	1330 V currents against each other and against
Open-circuit voltage	≤ 15 V	-	Tensions
Accuracy		Working voltage	300 V (nominal mains voltage phase-zero)
Basic accuracy	± 0.5% of the final value	Protection class	IP 40 housing, IP 20 terminals
Femperature drift	≤ 0.01 %/K	Protection class	II
		Measurement category	CAT III
	analog outputs	Degree of contamination	2
	1.		



### 00 200 19 00 front view

0001

00 01015 00

Weight

terminal	FU 2.2	
2	U <sub>E</sub> L <sub>1</sub>	
11	UEN (L2)	
13	U <sub>A</sub> (+)	
14	U <sub>A</sub> (-)	
16	U <sub>H</sub> L1(+)	
17	U <sub>H</sub> N (-)	
19	I <sub>A</sub> (+)	
20	I <sub>A</sub> (-)	

UE

approx. 230 g

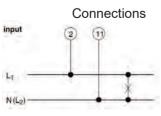
Terminal assignment

- voltage input The numbers on the terminals conform to details in connection diagrams (refer to DIN 43 807).

current output voltage output IA UA

**UH** auxiliary voltage input

### **Block circuit diagram**

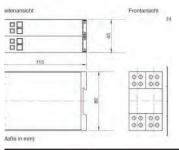


# MF-1.1 – Measuring transducer for frequency

Characteristic		0	rder i	numb	ber		
MF-1.1, frequency measuring transducer							
Order No.: FMU08 – xxxxxx	FMU	08 –	х	Х	Х	Х	Х
1. Input frequency range							
45 50 55 Hz			1				
48 50 52 Hz			2				
55 60 65 Hz			3				
58 60 65 Hz			4				
360 400 440 Hz			5				
380 400 420 Hz			6				
Special measuring range			9				
2. Input nominal voltage			•				
100 V				Α			
110 V				В			
115 V				С			
120 V				D			
230 V				E			
240 V				F			
380 V				G			
400 V				Н			
415 V				Ι			
440 V				K			
Special nominal voltage				Z			
3. Output	•						
0 20 mA and 0 10 V					1		
0 10 mA and 0 10 V					2		
0 5 mA and 0 10 V					3		
4 20 mA and 2 10 V					4		
- 20 0 20 mA and - 10 0 10 V					5		
Special output					9		
4. Auxiliary power supply							
AC 230 V (195 253 V), (48 62 Hz)						1	
AC 115 V (98 126 V), (48 62 Hz)						2	
DC 24 V (20 72 V)						3	
DC 20 100 V / AC 15 70 V						4	
DC 90 357 V / AC 65 253 V						5	
5. Test reports							
without test report							0
with test report German_English							1

53





# MPLz.1

### Measuring transducer for phase angle or power factor

### Characteristics/uses

- Measuring output 0(4) ... 20 mA, 0(2) ... 10 V
- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715
- Measuring input: Sinusoidal voltages and currents in AC and three-phase mains with an even load
- Measurement output: Unipolar and live-zero output variables

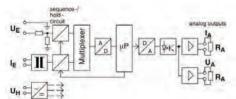
### Application

Measuring transducer for detecting the phase angle between current and voltage in the equally loaded AC and three-phase mains. An load-independent DC current and imprinted DC voltage signal are available as output signals, which are proportional to the phase angle or power factor between the measured variables current and voltage.

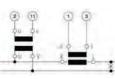
### **Functional principle**

A converter in the current path and a divider in the voltage path adapt the input signals and pass them on to an A/D converter via a multiplexer. A microprocessor processes the digitised signals in real time. The signal reaches the output stages via a D/A converter and an opto-coupler for galvanic isolation.

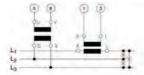
	Technic	al parameters	
Measuring input		Nominal conditions	
Measuring ranges	Cap 0.8 10.8 ind	Auxiliary voltage	UHN ±1%, 48 62 Hz
	Cap 0.5 10.5 ind	Input voltage	UEN _0.5%
Nominal frequency	4862 Hz	Power factor	cos φ=1
		Frequency	5060 Hz
Input nominal voltage UEN	65,100,110,240,400,415,440,500 V	Waveform	Sine, distortion factor $\leq 0.1\%$
		Ambient temperature	23°C ±1K
Intrinsic consumption	approx. 0.25 mA per voltage path	Warm-up time	≥5 min
	I2 $\cdot$ 0.01 $\Omega$ per current path	Auxiliary energy	
		AC voltage	230 V~ (-15% +10%); < 7 VA
Overload capacity	$1.2 \cdot U_{\text{EN}}$ or 1.2 $I_{\text{EN}},$ permanent		115 V~ (-15% +10%); < 4 VA
	$2 \cdot U_{\text{EN}},  10 \ I_{\text{EN}}$ max. 1 sec.	DC voltage	24 V = (20 72V); < 3 VA
Operating voltage	max. 519 V	Wide range	20 100 V= or 15 70V~; < 3 VA
Measurement output		AC / DC	90 357 V= or 65 253V~; < 4 7 VA
Nominal current IAN	0 20 mA or 4 20 mA	General technical data	
Load range RA	0 10 V / I <sub>AN</sub>	Test voltage	2210 V all circuits against housing
Current limitation	to 120 140% of the final value		3536 V all circuits to each other
Nominal voltage UAN	0 10 V or 2 10 V		1330 V currents against each other and against voltage
Load RA	≥ 4 kΩ	Working voltage	300 V (nominal mains voltage phase-zero)
Load error	≤ 0.1% at 50% load change		
Residual ripple	≤ 1% eff	Protection class	IP 40 housing, IP 20 terminals
Setting time	approx. 500ms <		
Open-circuit voltage	≤ 15 V	Protection class	II
Accuracy		Measurement category	CAT III
Basic accuracy	± 0.5% of the final value	Degree of contamination	2
Temperature drift	≤ 0.01 %/K	Weight	approx. 270 g



Block circuit diagram







CU22E

### Terminal assignment

00 00	terminal	CU 2.2 E
00 00	1	IEL1
	.2	UELI
CU 2.2 D	3	IE LT
	5	1
00 00	8	÷
00000	11	U <sub>E</sub> N.
	13	U <sub>A</sub> (+)
	14	U <sub>A</sub> ()
	15	UHLI(+)
	17	UHN (-)
	19	IA (+)

1	IEL1	IE L1
2	UEL1	
3	IE LT	IE L1
5	2	UELa
8	× .	UELa
- 11	UEN	+
13	U <sub>A</sub> (+)	U <sub>A</sub> (+)
14	U <sub>A</sub> (-)	U <sub>A</sub> ()
15	U <sub>H</sub> L <sub>t</sub> (+)	U <sub>H</sub> L <sub>1</sub> (+)
17	UHN (-)	UHN (-)
19	IA (+)	l <sub>A</sub> (+)
20	IA ()	IA ()

CU 2.2 D

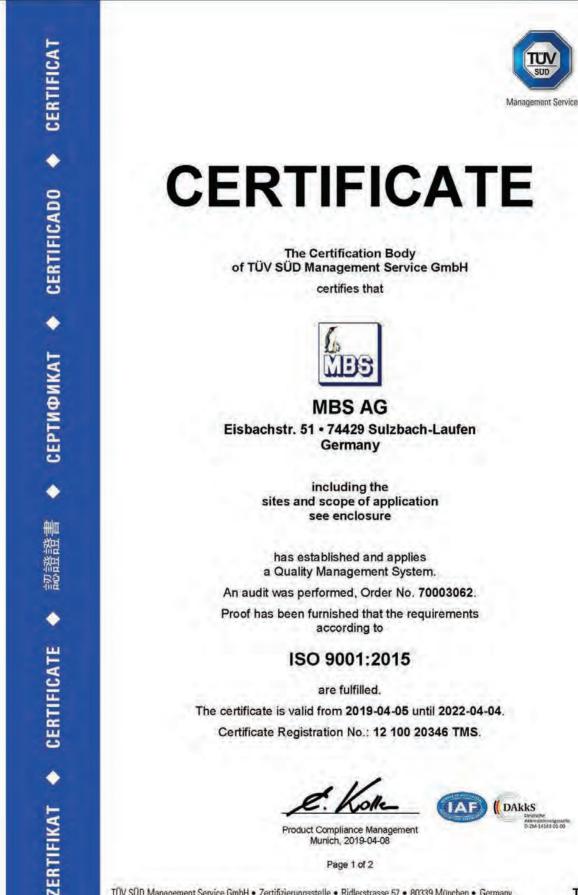
UA current output

U<sub>H</sub> auxiliary voltage inpu

The numbers on the terminals conform to detai in connection diagrams (refer to DIN 43 807).

# MPIz.1 – Measuring transducer for phase angle or power factor

Characteristic	Order number									
MPIz.1, measuring transducer for phase angle/ power										
factor	GMU	09 –	х	x	х	х	х	х	х	х
Order No.: GMU09 – xxxxxxxx										
1. Application										
Single-phase alternating current mains			1	1			1			
Three-wire three-phase mains with an even load			2							
2. Current input					1	1		1		1
1 A				1						
5 A				5						
Special current input				9						
3. Voltage input										
65 V					1					
100 V					2					
110 V					3					
240 V					4					
400 V					5					
415 V					6					
440 V					7					
500 V					8					
Special voltage input					9					
4. Measuring range					9					
0 0										
-37° 0 37°						A				
corresponds to cos φ: cap 0.8 1 0.8 ind										
-60° 0 60°						В				
corresponds to cos φ: cap 0.5 1 0.5 ind										
according to specification in the range of -180° 0 180°						C				
corresponds to $\cos \phi$ (output): ind1 11 cap.										
clear measuring range - 175° to + 175°										
5. Input frequency range	-									
48 62 Hz (50/60 Hz)							1			
Special frequency							9			
6. Output	-							1	-	
0 20 mA and 0 10 V								1		
0 10 mA and 0 10 V								2		
0 5 mA and 0 10 V								3		
4 20 mA and 2 10 V								4		
- 20 0 20 mA and - 10 0 10 V								5		
Special output								9		
7. Auxiliary <b>power supply</b>										
AC 230 V (195 253 V), (48 62 Hz)									1	
AC 115 V (98 126 V), (48 62 Hz)									2	
DC 24 V (20 72 V)									3	
DC 20 100 V / AC 15 70 V									4	
DC 90 357 V / AC 65 253 V									5	
8. Test reports										
without test report										0
with test report German_English										1
	1									-



SUD

Page 1 of 2

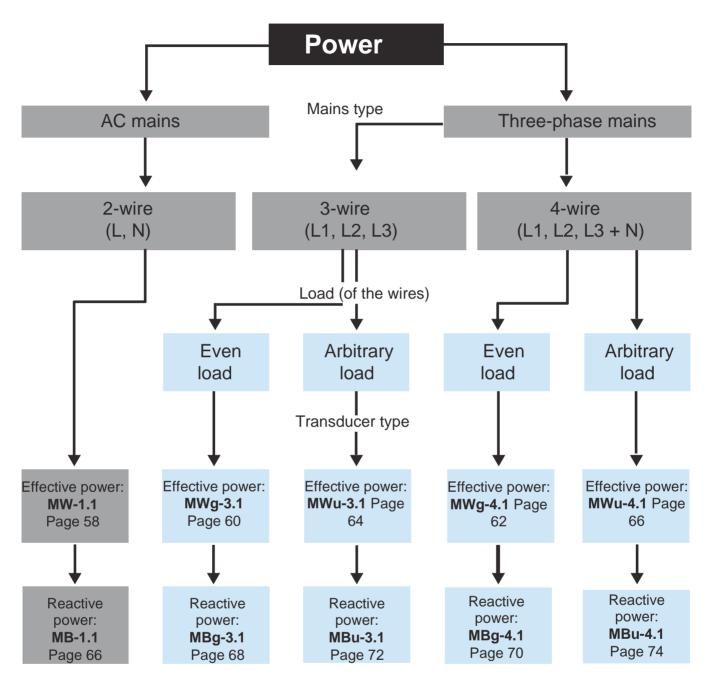
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TUV®

MSID/ D/UZNIS

# Measuring transducer for power

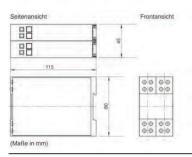
Type finding for power measuring transducers



### **Explanation of abbreviations**

M	Measuring transducer
M	
W	Effective power
В	Reactive power
g	Even load
u	Uneven load
1	Single-phase alternating current
3	Three-wire three-phase current
4	Four-wire three-phase current





# MW-1.1

Measuring transducer for effective power (also suitable for frequency inverters)

### Characteristics/uses

- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715
- Measuring input: Sinusoidal as well as non-sinusoidal voltages and currents on AC mains of any curve shape
- Measurement output: Unipolar, live-zero and bipolar output variables, as well as output with zero elevation

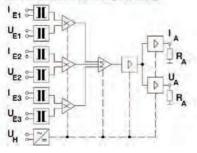
### Application

Measuring transducer for recording the active power of an AC mains. The output signal is a loadindependent DC current or imprinted DC voltage signal that is directly proportional to the active power of the primary mains.

### **Functional principle**

Measuring transducers for active and reactive power operate with an integrated analogue multiplier. The two converters in the current and voltage path galvanically separate the high-current circuits from the electronics and adjust the input current and voltage to the multiplier, which multiplies the measured values in an analogue way and integrates them with a low-pass filter.

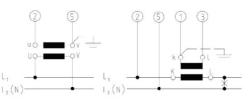
	Technic	al parameters					
Measuring input		Nominal conditions					
Nominal frequency	50 or 60 Hz,	Auxiliary voltage	Uнм ±2%, 50 60 Hz				
	Harmonic content ≤ 0.2	Input voltage	Uen ± 0.5%				
Nominal input current IEN	00.5-5 A	Power factor	sin φ = 1.0 0.8				
Input nominal voltage UEN	0 50-519 V	Frequency	50 / 60 Hz				
Intrinsic consumption	approx. 1 mA per voltage path	Waveform	Sine, distortion factor ≤ 0.1%				
	< 0.1 VA per current path at 1 A input	Ambient temperature	23°C ±1K				
	< 0.4 VA per current path at 5 A input	Warm-up time	≥ 5 min				
Overload capacity	1.2 · UEN or 1.2 IEN, permanent	Auxiliary power supply	y .				
	2 UEN, 20 IEN max. 1 sec.	AC voltage	230 V~ (-15% +10%); < 7 VA				
Operating voltage	max. 519 V		115 V~ (-15% +10%); < 4 VA				
Measurement output		DC voltage	24 V = (20 72V); < 3 VA				
Nominal current IAN	0 20 mA or 4 20 mA	Wide range	20 100 V= or 15 70V~; < 3 VA				
Load range RA	0 10 V / Ian	AC / DC	90 357 V= or 65 253V~; < 4 7 VA				
Current limitation to approx. 3	7 mA	General technical data					
Nominal voltage UAN	0 10 V or 2 10 V	Test voltage	All circuits against housing: 3510 Veff 5 sec.				
Load RA	≥ 4 kΩ		Measuring circuit and auxiliary voltage				
Load error	≤ 0.1% at 50% load change		against output: 3510 Veff 5 sec.				
Residual ripple	≤ 1%eff		Currents against each other and against				
Setting time	approx. 500ms		voltage: 3510 Veff 5 sec.				
Open-circuit voltage	≤ 15 V	Working voltage	300 V (nominal mains voltage phase-zero)				
Accuracy		Protection class	IP 40 housing, IP 20 terminals				
Basic accuracy	± 0.5% of the final value	Protection class	II				
Temperature drift	≤ 0.02 %/K	Measurement category	CAT III				
		Degree of contamination	1 2				



Block circuit diagram (example)

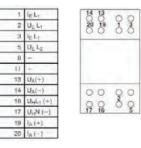
### Connections

Weight



### Terminal assignment

approx. 270 g

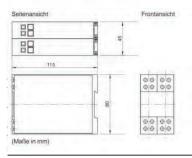


# MW-1.1 – Measuring transducer for effective power

# (also suitable for frequency inverters)

Characteristic	Order number									
MW-1.1, measuring transducer for effective power										
Order No.: PMU10 – xxxxxxxx	PMU	10 -	х	х	х	х	х	х	х	х
1. Application										
Single-phase alternating current			1							
2. Current input	1	1				1				
1 A primary current please specify				1						
5 A primary current please specify	5									
Special current input				9	1					
3.Voltage input										
Input voltages Um (AC)										
Please specify translation ratio										
65 V					1					
100 V					2					
110 V					3					
240 V					4					
300 V					5					
Special voltage input					9					
4. Measuring range										
Measuring range: please specify W						1				
5. Frequency range										
48 62 Hz (50/60 Hz)							1			
Special frequency							9			
6. Output										
0 20 mA and 0 10 V								1		
0 10 mA and 0 10 V								2		
0 5 mA and 0 10 V								3		
4 20 mA and 2 10 V								4		
- 20 0 20 mA and - 10 0 10 V								5		
7. Auxiliary <b>power supply</b>										
AC 230 V (195 253 V), (48 62 Hz)									1	
AC 115 V (98 126 V), (48 62 Hz)									2	
DC 24 V (20 72 V)									3	
DC 20 100 V / AC 15 70 V									4	
DC 90 357 V / AC 65 253 V									5	
8. Test reports										
without test report										0
with test report German_English										1





# MWg-3.1

Measuring transducer for effective power (also possible for frequency inverters)

### Characteristics/uses

- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715
- Measuring input: Sinusoidal as well as non-sinusoidal voltages and currents on three-phase mains of any curve shape
- Measurement output: Unipolar, live-zero and bipolar output variables, as well as output with zero elevation

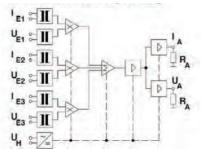
### Application

Measuring transducer for recording the active power of a 3-wire three-phase mains with an even phase load. The output signal is a load-independent DC current or imprinted DC voltage signal that is directly proportional to the active power of the primary mains.

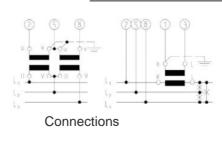
### **Functional principle**

Measuring transducers for active and reactive power operate with an integrated analogue multiplier. The two converters in the current and voltage path galvanically separate the high-current circuits from the electronics and adjust the input current and voltage to the multiplier, which multiplies the measured values in an analogue way and integrates them with a low-pass filter.

	Technic	al parameters					
Measuring input		Nominal conditions					
Nominal frequency	50 or 60 Hz,	Auxiliary voltage	Uнм ±2%, 50 60 Hz				
	Harmonic content ≤ 0.2	Input voltage	Uen ± 0.5%				
Nominal input current IEN	00.5-5 A	Power factor	sin φ = 1.0 0.8				
Input nominal voltage UEN	0 50-519 V	Frequency	50 / 60 Hz				
Intrinsic consumption	approx. 1 mA per voltage path	Waveform	Sine, distortion factor ≤ 0.1%				
	< 0.1 VA per current path at 1 A	Ambient temperature	23°C ±1K				
	< 0.4 VA per current path at 5 A	Warm-up time	≥ 5 min				
Overload capacity	1.2 · UEN or 1.2 IEN, permanent	Auxiliary power supply	/				
	2 · UEN, 20 IEN max. 1 sec. AC voltage		230 V~ (-15% +10%); < 7 VA				
Operating voltage	max. 519 V		115 V~ (-15% +10%); < 4 VA				
Measurement output		DC voltage	24 V = (20 72V); < 3 VA				
Nominal current IAN	0 20 mA or 4 20 mA	Wide range	20 100 V= or 15 70V~; < 3 VA				
Load range RA	0 10 V / Ian	AC / DC	90 357 V= or 65 253V~; < 4 7 VA				
Current limitation	to approx. 37 mA	General technical data					
Nominal voltage UAN	0 10 V or 2 10 V	Test voltage	All circuits against housing: 3510 Veff 5 sec.				
Load RA	≥ 4 kΩ		Measuring circuit and auxiliary voltage against				
Load error	≤ 0.1% at 50% load change		Output: 3510 Veff 5 sec.				
Residual ripple	≤ 1%eff		currents against each other and against				
Setting time	approx. 500ms		Voltage: 3510 Veff 5 sec.				
Open-circuit voltage	≤ 15 V	Working voltage	300 V (nominal mains voltage phase-zero)				
Accuracy		Protection class	IP 40 housing, IP 20 terminals				
Basic accuracy	± 0.5% of the final value	Protection class	II				
Temperature drift	≤ 0.02 %/K	Measurement category	CAT III				
া নাম		Degree of contamination	1 2				



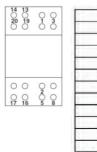
Block circuit diagram (example)



Weight

# Terminal assignment

approx. 270 g



1	IE LI
2	UE L1
3	IEL1
5	U <sub>E</sub> L <sub>2</sub>
8	U <sub>E</sub> L <sub>3</sub>
1	-
3	U <sub>A</sub> (+)
4	U <sub>A</sub> (-)
6	U <sub>H</sub> L <sub>1</sub> (+)
7	U <sub>H</sub> N (-)
9	JA (+)
0	1A (-)

# MWg-3.1 – Measuring transducer for effective power (also suitable for frequency inverters)

	Order number									
MWg-3.1, measuring transducer for effective power		1								
Order No.: PMU11 – xxxxxxxx	PMU	11 -	х	х	х	х	х	х	х	х
1. Application										
3-wire three-phase current, even load			1							
2. Current input										1
1 A primary current please specify				1						
5 A primary current please specify				5						
Special current input				9						
3.Voltage input										
Input voltages Um (AC)										
Please specify translation ratio										
65 V					1					
100 V					2					
110 V					3					
240 V					4					
400 V (Max. 300 V nominal mains voltage phase-zero)					5					
415 V (Max. 300 V nominal mains voltage phase-zero)					6					
440 V (Max. 300 V nominal mains voltage phase-zero)					7					
500 V (Max. 300 V nominal mains voltage phase-zero)					8					
Special voltage input					9					
4. Measuring range	•									
Measuring range: please specify W						1				
5. Frequency range	·									
48 62 Hz (50/60 Hz)							1			
Special frequency							9			
6. Output	•									
0 20 mA and 0 10 V								1		
0 10 mA and 0 10 V								2		
0 5 mA and 0 10 V								3		
4 20 mA and 2 10 V								4		
- 20 0 20 mA and - 10 0 10 V								5		
7. Auxiliary power supply										
AC 230 V (195 253 V), (48 62 Hz)									1	
AC 115 V (98 126 V), (48 62 Hz)									2	
DC 24 V (20 72 V)									3	
DC 20 100 V / AC 15 70 V									4	
DC 90 357 V / AC 65 253 V									5	
8. Test reports										
without test report										0
with test report German_English										1



# ieitenansicht Frontansicht Image: state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state stat

# MWg-4.1

Measuring transducer for effective power (also suitable for frequency inverters)

### Characteristics/uses

- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715
- Measuring input: Sinusoidal as well as non-sinusoidal voltages and currents on three-phase mains of any curve shape
- Measurement output: Unipolar, live-zero and bipolar output variables, as well as output with zero elevation

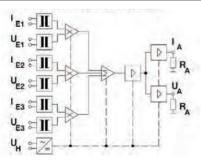
### Application

Measuring transducer for recording the effective power of a 4-wire three-phase mains with an even phase load. The output signal is a load-independent DC current or imprinted DC voltage signal that is directly proportional to the active power of the primary mains.

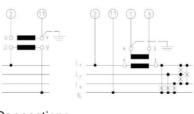
### **Functional principle**

Measuring transducers for active and reactive power operate with an integrated analogue multiplier. The two converters in the current and voltage path galvanically separate the high-current circuits from the electronics and adjust the input current and voltage to the multiplier, which multiplies the measured values in an analogue way and integrates them with a low-pass filter.

	Technica	l parameters	
Measuring input		Nominal conditions	
Nominal frequency	50 or 60 Hz,	Auxiliary voltage	Uнм ±2%, 50 60 Hz
	Harmonic content ≤ 0.2	Input voltage	Uen ± 0.5%
Nominal input current IEN	00.5-5 A	Power factor	sin φ = 1.0 0.8
nput nominal voltage UEN	0 50-519 V	Frequency	50 / 60 Hz
ntrinsic consumption	approx. 1 mA per voltage path	Waveform	Sine, distortion factor $\leq 0.1\%$
	< 0.1 VA per current path at 1 A input	Ambient temperature	23°C ±1K
	< 0.4 VA per current path at 5 A input	Warm-up time	≥ 5 min
Overload capacity	1.2 · UEN or 1.2 IEN, permanent	Auxiliary power supply	/
	2 · UEN, 20 IEN max. 1 sec.	AC voltage	230 V~ (-15% +10%); < 7 VA
Operating voltage	Max. 519 V		115 V~ (-15% +10%); < 4 VA
Measurement output		DC voltage	24 V = (20 72V); < 3 VA
Nominal current IAN	0 20 mA or 4 20 mA	Wide range	20 100 V= or 15 70V~; < 3 VA
_oad range R₄	0 10 V / Ian	AC / DC	90 357 V= or 65 253V~; < 4 7 VA
Current limitation	to approx. 37 mA	General technical data	
Nominal voltage UAN	0 10 V or 2 10 V	Test voltage	All circuits against housing: 3510 Veff 5 sec
Load RA	≥ 4 kΩ		Measuring circuit and auxiliary voltage against
_oad error	≤ 0.1% at 50% load change		Output: 3510 Veff 5 sec.
Residual ripple	≤ 1%eff		currents against each other and against
Setting time	approx. 500ms		Voltage: 3510 Veff 5 sec.
Open-circuit voltage	≤ 15 V	Working voltage	300 V (nominal mains voltage phase-zero)
Accuracy		Protection class	IP 40 housing, IP 20 terminals
Basic accuracy	± 0.5% of the final value	Protection class	II
Temperature drift	≤ 0.02 %/K	Measurement category	CAT III
		-	



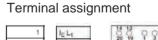
Block circiut diagram (example)



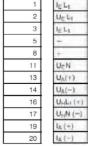
Weight

Degree of contamination 2

Connections



approx. 270 g



0 01	0 0 16	00	C C

# MWg-4.1 – Measuring transducer for effective power (also suitable for frequency inverters)

	Order number									
MWg-4.1, measuring transducer for effective power										
Order No.: PMU13 – xxxxxxxx	PMU	13 -	х	х	х	х	х	Х	Х	х
1. Application										
4-wire three-phase current, even load		1	1			1				
2. Current input		1					1			1
1 A primary current please specify				1						
5 A primary current please specify				5						
Special current input				9						
3.Voltage input										
Input voltages Um (AC)										
Please specify translation ratio										
65 V					1					
100 V					2					
110 V					3					
240 V					4					
400 V (Max. 300 V nominal mains voltage phase-zero)					5					
415 V (Max. 300 V nominal mains voltage phase-zero)					6					
440 V (Max. 300 V nominal mains voltage phase-zero)					7					
500 V (Max. 300 V nominal mains voltage phase-zero)					8					
Special voltage input					9					
4. Measuring range										
Measuring range: please specify W						1				
5. Frequency range										
48 62 Hz (50/60 Hz)							1			
Special frequency							9			
6. Output										
0 20 mA and 0 10 V								1		
0 10 mA and 0 10 V								2		
0 5 mA and 0 10 V								3		
4 20 mA and 2 10 V								4		
- 20 0 20 mA and - 10 0 10 V								5		
7. Auxiliary <b>power supply</b>										
AC 230 V (195 253 V), (48 62 Hz)									1	
AC 115 V (98 126 V), (48 62 Hz)									2	
DC 24 V (20 72 V)									3	
DC 20 100 V / AC 15 70 V									4	
DC 90 357 V / AC 65 253 V									5	
8. Test reports										
without test report										0
with test report German_English										1



# Beitenansicht Frontansicht

# MWu-3.1

Measuring transducer for effective power (also suitable for frequency inverters)

### Characteristics/uses

- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715
- Measuring input: Sinusoidal as well as non-sinusoidal voltages and currents on three-phase mains of any curve shape
- · Measurement output: Unipolar, live-zero and bipolar output variables, as well as output with zero elevation

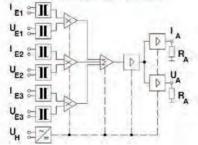
### Application

Measuring transducer for recording the effective power of a 3-wire three-phase mains with an even or arbitrary phase load. The output signal is a load-independent DC current or imprinted DC voltage signal that is directly proportional to the active power of the primary mains.

### **Functional principle**

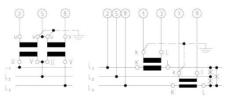
Measuring transducers for active and reactive power operate with an integrated analogue multiplier. The two converters in the current and voltage path galvanically separate the high-current circuits from the electronics and adjust the input current and voltage to the multiplier, which multiplies the measured values in an analogue way and integrates them with a low-pass filter.

	Technic	al parameters	
Measuring input		Nominal conditions	
Nominal frequency	50 or 60 Hz	Auxiliary voltage	Uнм ±2%, 50 60 Hz
	Harmonic content ≤ 0.2	Input voltage	Uen ± 0.5%
Nominal input current IEN	00.5-5 A	Power factor	sin φ = 1.0 0.8
nput nominal voltage UEN	0 50-519 V	Frequency	50 / 60 Hz
ntrinsic consumption	approx. 1 mA per voltage path	Waveform	Sine, distortion factor $\leq 0.1\%$
	< 0.1 VA per current path at 1 A	Ambient temperature	23°C ±1K
	< 0.4 VA per current path at 5 A	Warm-up time	≥ 5 min
Overload capacity	1.2 · UEN or 1.2 IEN, permanent	Auxiliary power supply	/
	2 · UEN, 20 IEN max. 1 sec.	AC voltage	230 V~ (-15% +10%); < 7 VA
Operating voltage	max. 519 V		115 V~ (-15% +10%); < 4 VA
Measurement output		DC voltage	24 V = (20 72V); < 3 VA
Nominal current IAN	0 20 mA or 4 20 mA	Wide range	20 100 V= or 15 70V~; < 3 VA
Load range RA	0 10 V / Ian	AC / DC	90 357 V= or 65 253V~; < 4 7 VA
Current limitation	to approx. 37 mA	General technical	data
Nominal voltage UAN	0 10 V or 2 10 V	Test voltage	All circuits against housing: 3510 Veff 5 sec.
Load RA	≥4 kΩ		Measuring circuit and auxiliary voltage against
_oad error	≤ 0.1% at 50% load change		Output: 3510 Veff 5 sec.
Residual ripple	≤ 1%eff		currents against each other and against
Setting time	approx. 500ms		Voltage: 3510 V <sub>eff</sub> 5 sec.
Open-circuit voltage	≤ 15 V	Working voltage	300 V (nominal mains voltage phase-zero)
Accuracy		Protection class	IP 40 housing, IP 20 terminals
Basic accuracy	± 0.5% of the final value	Protection class	II
Temperature drift	≤ 0.02 %/K	Measurement category	CAT III
		Degree of contamination	1 2
1 II			



Block circuit diagram (example)

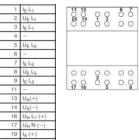
### Connections



Weight

### Terminal assignment

approx. 290 g



# MWu-3.1 – Measuring transducer for effective power (also suitable for frequency inverters)

MMU:3:1, measuring transducer for effective power Order No: PMU2 - xxxxxxxxx     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x     x </th <th></th> <th colspan="7">Order number</th> <th></th>		Order number									
1. Application       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1	MWu-3.1, measuring transducer for effective power		1								
3-wire three-phase current, arbitrary load       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1	Order No.: PMU12 – xxxxxxxx	PMU	12 -	Х	Х	Х	Х	Х	Х	Х	Х
2. Current input       1         1. A primary current please specify       5         Special current input       9         3. Voltage input       9         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       6         415 V (Max. 300 V nominal mains voltage phase-zero)       6         415 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         5 Jercial uncerv range       9         4. Measuring range: please specifyW       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         5 Som And 0 10 V       2         0 20 mA and 0 10 V       3         4 20 m. 0 0 0 10 V       3         4 20 m. 0 0 0 10 V       3         4 20 m. 0 0 10 V       3         4 20 m. 0 0 10 V       3         5. Toutput       3	1. Application										
1 A primary current please specify       1         5 A primary current please specify       5         Special current input       9         3. Voltage input       9         Input voltages Um (AC)         Please specify translation ratio         65 V       1         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       6         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       6         5 Special voltage input       9         440 V (Max. 300 V nominal mains voltage phase-zero)       8         5 Special voltage input       9         4. Measuring range:       1         5 Frequency range       1         4. Measuring range:       1         5 Frequency range       1         6. Output       1         0 10 m A and 0 10 V       2         0 20 m A and 1.0 V       2         0 20 m A and 1.0 V       3         0 20 m A and 1.0 V       3         0 5m A and 0 10 V       3         0 5m A and 0 10 V       2 <td< td=""><td>3-wire three-phase current, arbitrary load</td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	3-wire three-phase current, arbitrary load			1							
S A primary current please specify       5         Special current input       9         3. Voltage input       1         Input voltages Um (AC)       9         Please specify translation ratio	2. Current input										
Special current input       9         3.Voltage input         Input voltages un (AC)         Please specify translation ratio         55 V         100 V         100 V         2         110 V         240 V         4         240 V         4         40 V (Max. 300 V nominal mains voltage phase-zero)         5         50 V (Max. 300 V nominal mains voltage phase-zero)         6         50V (Max. 300 V nominal mains voltage phase-zero)         6         5         5         5         5         5         6         7         5         5         7         5         7         5         7         8         9         4         1         5         7         4         4         5         7         8         5         6         1         0         1 <td>1 A primary current please specify</td> <td></td> <td></td> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	1 A primary current please specify				1						
3. Voltage input input voltages Um (AC)         Please specify translation ratio         2         100 V         100 V         2         110 V         2         100 V         2         110 V         2         100 V         2         110 V         2         110 V         2         110 V         2         11         20 V (Max. 300 V nominal mains voltage phase-zero)         6         4400 V (Max. 300 V nominal mains voltage phase-zero)         6         500 V (Max. 300 V nominal mains voltage phase-zero)         7         500 V (Max. 300 V nominal mains voltage phase-zero)         8         Special voltage input         9         4. Measuring range:         Please specify	5 A primary current please specify				5						
Input voltages Um (AC)         Please specify translation ratio         65 V       1         100 V       2         110 V       3         240 V (Max. 300 V nominal mains voltage phase-zero)       4         400 V (Max. 300 V nominal mains voltage phase-zero)       6         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         5pecial voltage input       9         4. Measuring range:       1         8	Special current input				9						
Please specify translation ratio       1         65 V       1         100 V       2         100 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       6         415 V (Max. 300 V nominal mains voltage phase-zero)       6         417 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         5 pecial voltage input       9         4. Measuring range:       1         5. Frequency range       1         5. Frequency range       1         5. Special frequency       9         6. Output       1         5. Special frequency       1         6. Output       1         5. Special frequency frequency       9         6. Output       1         0 10 mA and 0 10 V       1         0 20 mA and 2 10 V       2         1	3.Voltage input										
65 V       1         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       4         415 V (Max. 300 V nominal mains voltage phase-zero)       6         500 V (Max. 300 V nominal mains voltage phase-zero)       6         500 V (Max. 300 V nominal mains voltage phase-zero)       6         500 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         Measuring range       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         5. Grequency range       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       3         4 20 0 20 mA and -10 0 10 V       5         7. Auxillary power supply       4         Ac 115 V (98 126 V), (48 62 Hz)       1         Ac 115 V (98 126 V), (48 62 Hz)       2         0 C 20 100 V / Ac 15 70 V       3         0 C 20 100 V /	Input voltages Um (AC)										
100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special routage input       9         4. Measuring range       1         Measuring range       1         Special frequency fange       1         5. Frequency range       1         Special frequency       1         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 10 0 10 V       2         1 20 mA and 2 10 V       4         -20 0 20 mA and -10 0 10 V       5         7. AuxIlliary power supply       1         AC 230 V (195 253 V), (48 62 Hz)       1         AC 230 V (195 253 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 65 253 V <td>Please specify translation ratio</td> <td></td>	Please specify translation ratio										
110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         Measuring range       1         Special frequency range       1         4862 Hz (S0/60 Hz)       1         Special frequency       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       1         0 20 mA and 2 10 V       3         4 20 mA and 2 10 V       3         4 20 mA and 2 10 V       3         4 20 mA and 2 10 V       4         -20 0 20 mM and -10 0 10 V       5         7. Auxilliary power supply       2         AC 230 V (195 253 V), (48 62 Hz)       2         AC 240 V (20 72 V)       3         DC 20 357 V / AC 65 253 V       5         DC 20 357 V / AC 65 253 V       <	65 V					1					
240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         4. Measuring range       1         5. Frequency range       1         5. Frequency range       9         48 62 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 2 10 V       4         4 20 mA and 2 10 V       4         -20 0 20 mA and -10 0 10 V       4         -20 0 20 mA and 2 10 V       2         7. Auxilliary power supply       2         AC 230 V (195 253 V), (48 62 Hz)       2         DC 24 V (20 72 V)       2         DC 20 100 V / AC 15 70 V       2         DC	100 V					2					
400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. MeasUring range       9         Measuring range       1         Measuring range       1         Special frequency range       1         Special frequency       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       2         1. 20 mA and 0 10 V       3         2. 20 mA and 0 10 V       4         2. 20 mA and 0 10 V       4         2. 20 mA and 0 10 V       2         1. 20 mA and 0 10 V       3         2. 3. 3       4         2. 42 M A and 2 10 V       4         2. 20 mA and 2 10 V       4         2. 20 m A and 2 10 V       5         7. Auxillary power supply       4         AC 210 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (42 62 Hz)       3 <td>110 V</td> <td></td> <td></td> <td></td> <td></td> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td>	110 V					3					
415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         Measuring range:       1         Special voltage input       1         Measuring range:       1         Measuring range:       1         Special frequency range       1         4862 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         020 mA and 0 10 V       1         020 mA and 0 10 V       1         020 mA and 0 10 V       1         020 mA and 0 10 V       2         030 mA and 10 0 V       1         420 mA and 2 10 V       3         -20020 mA and 10 0 V       4         -20020 mA and 10 10 V       5         7. Auxillary power supply       2         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 20 100 V / AC 15 70 V       3         DC 20 357 V / AC 65 253 V <td>240 V</td> <td></td> <td></td> <td></td> <td></td> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td>	240 V					4					
440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       1         Measuring range: please specifyW       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       3         4 20 mA and 2 10 V       3         -20 0 20 mA and 10 0 10 V       3         -20 0 20 mA and 10 0 10 V       3         -20 0 20 mA and -10 0 10 V       4         -20 0 20 mA and -10 0 10 V       5         7. Auxilliary power supply       4         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 20 100 V / AC 15 70 V       3         DC 20 357 V / AC 65 253 V       5         8. Test reports       5	400 V (Max. 300 V nominal mains voltage phase-zero)					5	1				
500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       1         Measuring range:       1         5. Frequency range       1         4862 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         020 mA and 0 10 V       1         020 mA and 0 10 V       2         05 mA and 0 10 V       3         420 mA and 0 10 V       4         -20020 mA and 10 0 10 V       5         7. Auxillary power supply       4         AC 115 V (98 126 V), (48 62 Hz)       1         0 C 20 70 V       1       2         DC 20 357 V / AC 65 253 V       3       2         8. Test reports       4       5         without test report       0       4	415 V (Max. 300 V nominal mains voltage phase-zero)					6					
Special voltage input       9         4. Measuring range       1         Measuring range:       please specifyW         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 0 10 V       4         - 20 0 20 mA and 10 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxillary power supply       5         7. Auxillary power supply       1         AC 230 V (195 253 V), (48 62 Hz)       1         DC 20 327 V / AC 65 253 V       3         DC 20 357 V / AC 65 253 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	440 V (Max. 300 V nominal mains voltage phase-zero)					7	1				
4. Measuring range       1         Measuring range: please specifyW       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 5 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 115 V (98 126 V), (48 62 Hz)       1         AC 20 V (195 253 V), (48 62 Hz)       2         DC 20 100 V / AC 15 70 V       2         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5	500 V (Max. 300 V nominal mains voltage phase-zero)					8					
Measuring range:       please specifyW       1         5. Frequency range       1       1         48 62 Hz (50/60 Hz)       9       9         5. Frequency       9       9         6. Output       9       1         0 20 mA and 0 10 V       1       2         0 20 mA and 0 10 V       2       2         0 5 mA and 0 10 V       3       2         0 5 mA and 0 10 V       4       2         0 5 mA and 0 10 V       4       2         0 20 mA and 2 10 V       4       2         7. Auxiliary <b>power supply</b> 5       5         7. Auxiliary <b>power supply</b> 1       2         AC 115 V (98 126 V), (48 62 Hz)       1       1         AC 115 V (98 126 V), (48 62 Hz)       1       2         DC 24 V (20 72 V)       2       3         DC 20 100 V / AC 15 70 V       4       2         DC 90 357 V / AC 65 253 V       5       5         8. Test reports       5       5	Special voltage input					9					
5. Frequency range       1         4862 Hz (50/60 Hz)       9         5. Frequency       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 5 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       1         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5	4. Measuring range										
4862 Hz (50/60 Hz)       1         Special frequency       9         6. Output       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       2         0 5 mA and 0 10 V       2         4 20 mA and 2 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       4         7. Auxilliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       1         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5	Measuring range: please specify W						1				
Special frequency         9           6. Output         1           0 20 mA and 0 10 V         1           0 10 mA and 0 10 V         2           0 5 mA and 0 10 V         3           4 20 mA and 2 10 V         4           - 20 0 20 mA and - 10 0 10 V         4           - 20 0 20 mA and - 10 0 10 V         5           7. Auxiliary power supply         5           AC 230 V (195 253 V), (48 62 Hz)         1           AC 115 V (98 126 V), (48 62 Hz)         1           AC 115 V (98 126 V), (48 62 Hz)         2           DC 24 V (20 72 V)         3           DC 20 100 V / AC 15 70 V         4           DC 90 357 V / AC 65 253 V         5           8. Test reports         5           without test report         0	5. Frequency range							1			
6. Output       1         0 20 mA and 0 10 V       2         0 10 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 215 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5	48 62 Hz (50/60 Hz)							1			
0 20 mA and 0 10 V       1         0 10 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	Special frequency							9			
0 10 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       1         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	6. Output										
0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       3         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	0 20 mA and 0 10 V								1		
4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       1         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	0 10 mA and 0 10 V								2		
- 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       7. Auxiliary power supply         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	0 5 mA and 0 10 V								3		
7. Auxiliary power supply         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	4 20 mA and 2 10 V								4		
AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	- 20 0 20 mA and - 10 0 10 V								5		
AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0									1	1	
AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0										1	
DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0										2	
DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0										3	
DC 90 357 V / AC 65 253 V         5           8. Test reports         5           without test report         0										4	
8. Test reports       without test report         0										5	
without test report 0											
											0
	with test report German_English										-



# Seitenansicht Frontansicht

# MWu-4.1

Measuring transducer for effective power (also suitable for frequency inverters)

### Characteristics/uses

- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715
- Measuring input: Sinusoidal as well as non-sinusoidal voltages and currents on three-phase mains of any curve shape
- · Measurement output: Unipolar, live-zero and bipolar output variables, as well as output with zero elevation

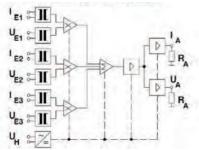
### Application

Measuring transducer for recording the effective power of a 3-wire three-phase mains with an even or arbitrary phase load. The output signal is a load-independent DC current or imprinted DC voltage signal that is directly proportional to the active power of the primary mains.

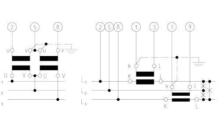
### **Functional principle**

Measuring transducers for active and reactive power operate with an integrated analogue multiplier. The two converters in the current and voltage path galvanically separate the high-current circuits from the electronics and adjust the input current and voltage to the multiplier, which multiplies the measured values in an analogue way and integrates them with a low-pass filter.

	Technic	al parameters					
Measuring input		Nominal conditions					
Nominal frequency	50 or 60 Hz	Auxiliary voltage	Uнм ±2%, 50 60 Hz				
	Harmonic content $\leq 0.2$	Input voltage	Uen ± 0.5%				
Nominal input current IEN	00.5-5 A	Power factor	sin φ = 1.0 0.8				
Input nominal voltage UEN	0 50-519 V	Frequency	50 / 60 Hz				
Intrinsic consumption	approx. 1 mA per voltage path	Waveform	Sine, distortion factor ≤ 0.1%				
	< 0.1 VA per current path at 1 A	Ambient temperature	23°C ±1K				
	< 0.4 VA per current path at 5 A	Warm-up time	≥ 5 min				
Overload capacity	1.2 · UEN or 1.2 IEN, permanent	Auxiliary power supply	/				
	2 · UEN, 20 IEN max. 1 sec.	AC voltage	230 V~ (-15% +10%); < 7 VA				
Operating voltage	max. 519 V		115 V~ (-15% +10%); < 4 VA				
Measurement output		DC voltage	24 V = (20 72V); < 3 VA				
Nominal current IAN	0 20 mA or 4 20 mA	Wide range	20 100 V= or 15 70V~; < 3 VA				
Load range RA	0 10 V / Ian	AC / DC	90 357 V= or 65 253V~; < 4 7 VA				
Current limitation	to approx. 37 mA	General technical	data				
Nominal voltage UAN	0 10 V or 2 10 V	Test voltage	All circuits against housing: 3510 Veff 5 sec.				
Load RA	≥ 4 kΩ		Measuring circuit and auxiliary voltage against				
Load error	≤ 0.1% at 50% load change		Output: 3510 Veff 5 sec.				
Residual ripple	≤ 1%eff		currents against each other and against				
Setting time	approx. 500ms		Voltage: 3510 Veff 5 sec.				
Open-circuit voltage	≤ 15 V	Working voltage	300 V (nominal mains voltage phase-zero)				
Accuracy		Protection class	IP 40 housing, IP 20 terminals				
Basic accuracy	± 0.5% of the final value	Protection class	II				
Temperature drift	≤ 0.02 %/K	Measurement category	CAT III				
। जग		Degree of contaminatior	1 2				



Block circuit diagram (example)

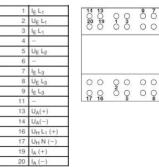


Weight

### Connections

### Terminal assignment

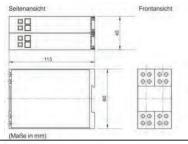
approx. 290 g



# MWu-4.1 – Measuring transducer for effective power (also suitable for frequency inverters)

IMMUL-4.1. measuring transducer for effective power     PMU     14-     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X  <		Order number									
1. Application       1       1       1       1         4-wire three-phase current, arbitrary load       1       1       1       1         2. Current Input       1       5       5       5         Special current input       9       3. Voltage Input       9       3. Voltage Input       9         3. Voltage Input       9       3. Voltage Input       9       3. Voltage Input       9       3. Voltage Input       9         100 V       2       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1 </td <td>MWu-4.1, measuring transducer for effective power</td> <td colspan="3">MWu-4.1, measuring transducer for effective power</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	MWu-4.1, measuring transducer for effective power	MWu-4.1, measuring transducer for effective power									
4-wire three-phase current, arbitrary load       1       1       1       1         2. Current input       1       1       1       1       1         5. A primary current please specify       5       5       5       5         Special current input       9       9       5       5       5         Soltage input       9       9       5       5       5       5         Soltage input       9       3       5       5       5       5       5       5       5       5       5       5       5       5       5       1       1       100       100       100       2       100       100       2       100       3       240 V       4       400 V (Max. 300 V nominal mains voltage phase-zero)       5       415 V (Max. 300 V nominal mains voltage phase-zero)       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5 </td <td>Order No.: PMU14 – xxxxxxxx</td> <td>PMU</td> <td>14 -</td> <td>Х</td> <td>Х</td> <td>Х</td> <td>Х</td> <td>Х</td> <td>Х</td> <td>Х</td> <td>Х</td>	Order No.: PMU14 – xxxxxxxx	PMU	14 -	Х	Х	Х	Х	Х	Х	Х	Х
2. Current input       1         1 A primary current please specify       5         5 A primary current please specify       9         3. Voltage input       9         100 V       2         110 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         5 Special voltage input       9         4. Measuring range:       1         5. Frequency range       1         6. Output       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       4         -2.0. 0 20 mA and -10 0 10 V       5         -3       1         -2       2         -2       1         -2       2         0       2         1	1. Application										
1 A primary current please specify       1         5 A primary current input       9         3. Voltage input       9         3. Voltage input       9         3. Voltage input       9         9       1         1       1         9       1         9       1         1       1         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       6         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         5 Special voltage input       9         4. Measuring range:       9         4. Measuring range:       1         5. Frequency range       1         6. Output       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       3         0 20 mA and 1 10 V       3         2 20 mA and 2 10 V       4         -20 0 20 mA and -10 0 10 V       2         0 20 mA and -1 0.V       2 <td></td> <td></td> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>				1							
S A primary current please specify       5         Special current input       9         3.Voltage input       9         Input voltages Um (AC)       9         Please specify translation ratio       1         65 V       1         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       6         415 V (Max. 300 V nominal mains voltage phase-zero)       6         500 V (Max. 300 V nominal mains voltage phase-zero)       6         500 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         4. Measuring range       9         4. Measuring range       9         5. Frequency range       1         5. Special frequency       9         6. Output       1         0 20 mA and 0 10 V       2         0 20 mA and 1.0 0 10 V       3         4 20 mA and 2 10 V       4         -20 0 20 mA and -10 0 10 V       5         7. Auxillany power supply       1         <	2. Current input	•		•							
Special current input       9         3.Voltage input       input voltages un (AC)         Please specify translation ratio       1         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       1         Measuring range       1         5. Frequency range       1         8	1 A primary current please specify				1						
3. Voltage input Input voltages Um (AC) Please specify translation ratio       1         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         500 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range:       9         Measuring range:       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         5. Frequency range       9         6. Output       2         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       3         4 20 0 20 mA and -10 0 10 V       5         7. Auxillary power supply       2         AC 201 V (195 253 V), (48 62 Hz)       1         AC 215 V (20 72 V)       2         DC 24V (20 72 V)       3         DC 20 100 V / AC 15 70V       4 <t< td=""><td>5 A primary current please specify</td><td></td><td></td><td></td><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	5 A primary current please specify				5						
Input voltages Um (AC)         Please specify translation ratio         65 V       1         100 V       2         110 V       3         240 V (Max. 300 V nominal mains voltage phase-zero)       4         400 V (Max. 300 V nominal mains voltage phase-zero)       6         415 V (Max. 300 V nominal mains voltage phase-zero)       6         420 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         5pecial voltage input       9         4. Measuring range:       9         4. Measuring range:       1         5. Frequency range       1         4862 Hz (50/60 Hz)       1         5. Frequency range       9         6	Special current input				9						
Please specify translation ratio       1         65 V       1         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         4. Measuring range       1         5. Frequency range       1         5. Frequency range       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 2 10 V       2         1 20 mA and 2 10 V       5         7. Auxillary power supply       1         AC 115 V (98 125 V), (48 62 Hz)       1         C 20 0 20 mA and 2 10 V       3         7. Auxillary power supply       1         AC 115 V (98 125 V), (48 62 Hz)       1         C 20 0 20 V / Ac 65 Hz)       3	3.Voltage input										
65 V       1         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       6         500 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         4. Measuring range       1         5. Frequency range       1         6. Output       9         6. Output       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 2 10 V       4         4 20 mA and 2 10 V       4         4 20 mA and 2 10 V       2         7. Auxillary power supply       2         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 20 100 V / AC 15 70 V       2	Input voltages Um (AC)										
100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         4. Measuring range       1         5. Frequency range       1         5. Frequency range       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       3         4 20 mA and 2 10 V       4         -20 0 20 mA and -10 0 10 V       5         7. Auxillary power supply       5         AC 210 V (195 253 V), (48 62 Hz)       1         AC 230 V (195 253 V), (48 62 Hz)       2         DC 20 100 V / AC 45 70 V       3         DC 20 100 V / AC 45 70 V       4         DC 20 100 V / AC 45 70 V       4         DC	Please specify translation ratio										
110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       6         500 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         4. Measuring range       1         Special voltage input       9         4. Measuring range       1         5. Frequency range       1         8	65 V					1					
240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range:       9         Measuring range:       1         5. Frequency range       1         5. Frequency range       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       1         0 20 mA and 2 10 V       3         4 20 mA and 2 10 V       4         -20 0 20 mA and - 10 0 10 V       5         7. Auxilliary power supply       5         7. Auxillary power supply       2         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 20 100 V / AC 15 70 V       4         DC 20 357 V / AC 65 253 V       5         8. Test reports       5	100 V					2					
400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         Measuring range:       1         5. Frequency range       1         5. Frequency range       9         6. Output       1         5. Output       1         020 mA and 010 V       1         020 mA and 010 V       2         020 mA and 010 V       3         420 mA and 010 V       4         -20020 mA and 10010 V       5         7. Auxiliary power supply       1         AC 230 V (195253 V), (48 62 Hz)       1         AC 210 V (2072 V)       3         DC 20 37 V / AC 65253 V       5         S. Test reports       5	110 V					3					
415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         Measuring range:       1         5. Frequency range       1         4862 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         020 mA and 0 10 V       1         020 mA and 0 10 V       2         020 mA and 0 10 V       2         020 mA and 0 10 V       3         -20020 mA and 10 0 W       4         -20020 mA and 0 10 V       2         020 mA and 0 10 V       3         020 MA and 2 10 V       4         -20020 mA and -100 W       4         -20020 mA and -100 W       1         Ac 230 V (195 253 V), (4862 Hz)       1         AC 230 V (195 253 V), (4862 Hz)       2         DC 20 100 V / AC 15 70 V       3         DC 20 100 V / AC 15 70 V       3         DC 20 357 V / AC 65 253 V       5         8.	240 V					4					
415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         Measuring range:       1         5. Frequency range       1         4862 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         020 mA and 0 10 V       1         020 mA and 0 10 V       2         020 mA and 0 10 V       2         020 mA and 0 10 V       3         -20020 mA and 10 0 W       4         -20020 mA and 0 10 V       2         020 mA and 0 10 V       3         020 MA and 2 10 V       4         -20020 mA and -100 W       4         -20020 mA and -100 W       1         Ac 230 V (195 253 V), (4862 Hz)       1         AC 230 V (195 253 V), (4862 Hz)       2         DC 20 100 V / AC 15 70 V       3         DC 20 100 V / AC 15 70 V       3         DC 20 357 V / AC 65 253 V       5         8.	400 V (Max. 300 V nominal mains voltage phase-zero)					5					
500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       1         Measuring range:       1         5. Frequency range       1         4862 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         6. Output       1         020 mA and 0 10 V       2         05 mA and 0 10 V       3         420 mA and 0 10 V       3         420 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 230 V (195 253 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0						6					
Special voltage input       9         4. Measuring range       1         Measuring range:       please specifyW         1       1         5. Frequency range       1         4862 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         020 mA and 010 V       1         020 mA and 010 V       2         05 mA and 010 V       3         420 mA and 210 V       4         -20020 mA and -10010 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (4862 Hz)       1         AC 230 V (195 253 V), (4862 Hz)       2         DC 20357 V / AC 65 253 V       3         DC 20357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	440 V (Max. 300 V nominal mains voltage phase-zero)					7					
4. Measuring range       1         Measuring range: please specifyW       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       3         7. Auxiliary power supply       5         AC 115 V (98 126 V), (48 62 Hz)       1         AC 20 100 V / AC 15 70 V       2         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5	500 V (Max. 300 V nominal mains voltage phase-zero)					8					
Measuring range:       please specifyW       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 115 V (98 126 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 20 100 V / AC 15 70 V       3         DC 20 357 V / AC 65 253 V       5         8. Test reports       5	Special voltage input					9	1				
5. Frequency range       1         48 62 Hz (50/60 Hz)       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 10 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxilliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       1         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5	4. Measuring range										
48 62 Hz (50/60 Hz)       1         Special frequency       9         6. Output       1         0 20 mA and 0 10 V       1         0 10 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5	Measuring range: please specifyW						1				
48 62 Hz (50/60 Hz)       1         Special frequency       9         6. Output       1         0 20 mA and 0 10 V       1         0 10 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5	5. Frequency range										
6. Output       1         0 20 mA and 0 10 V       2         0 10 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       0								1			
6. Output       1         0 20 mA and 0 10 V       2         0 10 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       0	Special frequency							9			
0 10 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0											
0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0									1		
4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	0 10 mA and 0 10 V								2		
- 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       7. Auxiliary power supply         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	0 5 mA and 0 10 V								3		
7. Auxiliary power supply         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	4 20 mA and 2 10 V								4		
AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	- 20 0 20 mA and - 10 0 10 V								5		
AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0											
AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0										1	
DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       9         without test report       0										2	
DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       9         without test report       0										3	
DC 90 357 V / AC 65 253 V         5           8. Test reports         5           without test report         0										4	
8. Test reports     0										5	
without test report 0											
,											0
with test report German English	with test report German_English										-





# **MBg-3.1**

Measuring transducer for reactive power (also suitable for frequency inverters)

### Characteristics/uses

- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715 •
- Measuring input: Sinusoidal as well as non-sinusoidal voltages and • currents on three-phase mains of any curve shape
- Measurement output: Unipolar, live-zero and bipolar output variables, as • well as output with zero elevation

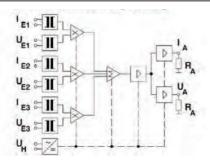
### Application

Measuring transducer for recording the reactive power of a 3-wire three-phase mains with an even phase load. The output signal is a load-independent DC current or imprinted DC voltage signal that is directly proportional to the active power of the primary mains.

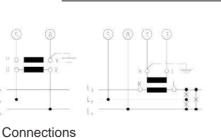
### **Functional principle**

Measuring transducers for active and reactive power operate with an integrated analogue multiplier. The two converters in the current and voltage path galvanically separate the high-current circuits from the electronics and adjust the input current and voltage to the multiplier, which multiplies the measured values in an analogue way and integrates them with a low-pass filter.

	Techr	nical parameters	
Measuring input		Nominal conditions	
Nominal frequency	50 or 60 Hz	Auxiliary voltage	Uнм ±2%, 50 60 Hz
	Harmonic content ≤ 0.2	Input voltage	Uen ± 0.5%
Nominal input current IEN	00.5-5 A	Power factor	sin φ = 1.0 0.8
Input nominal voltage UEN	0 50-519 V	Frequency	50 / 60 Hz
Intrinsic consumption	approx. 1 mA per voltage path	Waveform	Sine, distortion factor $\leq 0.1\%$
	< 0.1 VA per current path at 1 A	Ambient temperature	23°C ±1K
	< 0.4 VA per current path at 5 A	Warm-up time	≥ 5 min
Overload capacity	1.2 · UEN or 1.2 IEN, permanent	Auxiliary power supply	
	2 · UEN, 20 IEN max. 1 sec.	AC voltage	230 V~ (-15% +10%); < 7 VA
Operating voltage	Max. 519 V		115 V~ (-15% +10%); < 4 VA
Measurement output		DC voltage	24 V = (20 72V); < 3 VA
Nominal current IAN	0 20 mA or 4 20 mA		20 100 V= or 15 70V~; < 3 VA
Load range RA	0 10 V / Ian	-	90 357 V= or 65 253V~; < 4 7 VA
Current limitation	to approx. 37 mA	General technical data	
Nominal voltage UAN	0 10 V or 2 10 V	Test voltage	All circuits against housing: 3510 Veff 5 sec.
Load RA	≥ 4 kΩ	-	Measuring circuit and auxiliary voltage against
Load error	≤ 0.1% at 50% load change	-	Output: 3510 Veff 5 sec.
Residual ripple	≤ 1%eff	-	currents against each other and against
Setting time	approx. 500ms	-	Voltage: 3510 Veff 5 sec.
Open-circuit voltage	≤ 15 V	Working voltage	300 V (nominal mains voltage phase-zero)
Accuracy		Protection class	IP 40 housing, IP 20 terminals
Basic accuracy	± 0.5% of the final value	Protection class	II
Temperature drift	≤ 0.02 %/K	Measurement category	CAT III



Block circuit diagram (example)

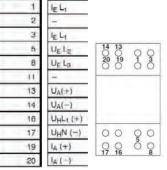


Weight

Degree of contamination 2

## Terminal assignment

approx. 270 g

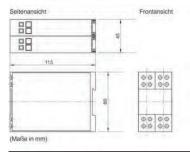


# MBg-3.1 – Measuring transducer for reactive power

# (also suitable for frequency inverters)

MBg. 3.1, measuring transducer for reactive power Order No. PMU         15         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X </th <th></th> <th colspan="3">Order number</th> <th></th>		Order number									
1. Application       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1	MBg-3.1, measuring transducer for reactive power										
3-wire three-phase current, even load       1       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I		PMU	15 -	Х	Х	Х	Х	Х	Х	Х	Х
2. Current input       1         1 A primary current please specify       5         Special current input       9         3. Voltage input       9         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       6         500 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         5 - Frequency range       9         4. Measuring range: please specifyW       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         5. Frequency range       9         20 mA and 0 10 V       2         0 20 mA and 0 10 V       3         4 20 mA and 1.0 V       3         0 20 mA and -10 0 10 V       3         0 20 mA and -10 0 10 V       3         0 20 mA and -10 0 10 V       2         0 20 mA and -10 0 10 V       3	1. Application										
1 A primary current please specify       1         5 A primary current please specify       5         Special current input       9         3.Voltage input       9         Input voltages Um (AC)       9         Please specify translation ratio       1         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       6         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       8         5 Frequency range       9         4. Measuring range:       1         5 Frequency range       1         5 Frequency range       1         6. Output       1         7       9         6. Output       1         0 10 m A and 0 10 V       2         0 20 m A and 1 10 V       3         0 5 mA and 0 10 V       3         0 20 m A and 1 10 V       3         0 20 m A and 2 10 V       3         0 20 m A and 2 10 V       3         0 20 m A and 1 10 V       2	3-wire three-phase current, even load			1							
S A primary current please specify       5         Special current input       9         3 Voltage input       1         Input voltages Um (AC)       2         Please specify translation ratio       2         65 V       1         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       6         415 V (Max. 300 V nominal mains voltage phase-zero)       6         500 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         4. Measuring range       9         5. Frequency range       1         5. Frequency range       9         6. Output       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       5         0 20 mA and 1.0 0 10 V       5         0 20 mA and 1.0 0 10 V       2         0 20 mA and 1.0 0 10 V       5         7. Auxillary power supply       1	2. Current input										
Special current input       9         3.Voltage input         Input voltages und AC)         Please specify translation ratio         55 V         100 V         100 V         100 V         100 V         110 V         2         110 V         240 V         400 V (Max. 300 V nominal mains voltage phase-zero)         415 V (Max. 300 V nominal mains voltage phase-zero)         415 V (Max. 300 V nominal mains voltage phase-zero)         500 V (Max. 300 V nominal mains voltage phase-zero)         6         440 V (Max. 300 V nominal mains voltage phase-zero)         7         500 V (Max. 300 V nominal mains voltage phase-zero)         8         Special voltage input         9         440 Max. 300 V nominal mains voltage phase-zero)         8         Special voltage input         9         4         Measuring range         Measuring range         8         Special requency         9         6. Output         0 20 mA and 0 10 V         0 20 mA and 2 10 V         0 20 mA and 2 10 V         2	1 A primary current please specify				1						
3. Voltage input Input voltages Um (AC) Please specify translation ratio       1         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       6         415 V (Max. 300 V nominal mains voltage phase-zero)       6         500 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range:       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         5. Frequency range       9         6. Output       9         0 20 m A and 0 10 V       1         0 20 m A and 0 10 V       1         0 20 m A and 0 10 V       2         0 20 m A and 0 10 V       2         7. Auxilliary power supply       4         Ac 203 V (195 253 V), (48 62 Hz)       1         Ac 215 V (96 253 V)       2         0.24 V (20 72 V)       2         0.22 100 V / Ac 15 70 V       2         0.22 100 V / Ac 25 253 V       3	5 A primary current please specify				5						
Input voltages Um (AC)         Please specify translation ratio         65 V       1         100 V       2         110 V       3         240 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       6         500 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         5pecial voltage input       9         4. Measuring range:       9         8	Special current input				9						
Please specify translation ratio       1         65 V       1         100 V       2         100 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         500 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         5 pecial voltage input       9         4. Measuring range:       1         5. Frequency range       1         6. Output       1         5. Frequency range       9         6. Output       1         7. Number of the set specify with the set specify with the set set specify with the set set set set set set set set set se	3.Voltage input										
65 V       1         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         500 V (Max. 300 V nominal mains voltage phase-zero)       6         500 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         4. Measuring range       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         5. Frequency range       9         6. Output       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       3         4 20 0 20 mA and 1.0 0 10 V       5         7. Auxillary power supply       4         Ac 115 V (98 126 V), (48 62 Hz)       1         Ac 115 V (98 126 V), (48 62 Hz)       2         0 C 20 100 V / Ac 15 70 V       3         DC 20 100 V / Ac 15 70 V       3	Input voltages Um (AC)										
100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       1         Measuring range       1         Special frequency fange       9         6. Output       1         Special frequency       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 10 0 10 V       2         4 20 mA and 2 10 V       4         -20 0 20 mA and -10 0 10 V       3         4 20 mA and 2 10 V       4         -20 0 20 mA and -10 0 10 V       5         7. AuxIlliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 230 V (195 253 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20	Please specify translation ratio										
110 V       3         240 V       4         240 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         4. Measuring range       1         Special voltage input       9         4. Measuring range       1         Special frequency range       9         6. Output       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       3         4 20 mA and 2 10 V       1         -20 0 20 mA and 10 0 10 V       3         7. Auxilliary power supply       4         AC 230 V (195 253 V), (48 62 Hz)       1         AC 240 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5 <td>65 V</td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td>	65 V					1					
240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         4. Measuring range       1         5. Frequency range       1         5. Frequency range       9         48 62 Hz (50/60 Hz)       1         Special frequency       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       3         4 20 mA and 2 10 V       4         -20 0 20 mA and -10 0 10 V       4         -20 0 20 mA and -10 0 10 V       5         7. Auxilliary power supply       2         AC 200 V (195 253 V), (48 62 Hz)       1         0 20 mA and 2 10 V       3         0 C 20 10 0 V / AC 15 70 V       2         DC 20 100 V / AC 15 70 V       3         DC 20 357 V / AC 65 253 V       5         8.	100 V					2					
400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. MeasUring range       9         Measuring range       1         Measuring range       1         Special frequency range       1         4. MeasUring range       1         Special frequency range       1         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       1         0 5 mA and 0 10 V       1         20 5 mA and 0 10 V       1         20 5 mA and 0 10 V       1         20 0 m A and 2 10 V       2         20 0 m A and 2 10 V       4         20 0 m A and 2 10 V       5         7. Auxillary power supply       1         AC 215 V (98 126 V), (48 62 Hz)       1         AC 215 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       2       2         DC 20 307 V / AC 65 253 V       3         DC 9	110 V					3					
415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       1         Measuring range       1         Special voltage input       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         Special frequency range       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       3         -20 0 20 mA and -10 0 10 V       4         -20 0 20 mA and -10 0 10 V       5         7. Auxilliary power supply       4         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 20 100 V / AC 15 70 V       3         DC 20 100 V / AC 15 70 V       3         DC 20 307 V / AC 65 253 V       5         8. Test reports       5	240 V					4					
440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       1         Measuring range:       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 10 0 w 10 V       4         -20 0 20 mA and -10 0 w 10 V       5         7. Auxilliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 215 V (98 126 V), (48 62 Hz)       2         DC 20 100 V / AC 15 70 V       3         DC 20 357 V / AC 65 253 V       5         8. Test reports       5         without test report       5	400 V (Max. 300 V nominal mains voltage phase-zero)					5					
500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       1         Measuring range:       please specifyW         5. Frequency range       1         4862 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         020 mA and 0 10 V       1         020 mA and 0 10 V       2         05 mA and 0 10 V       2         05 mA and 0 10 V       3         420 mA and 2 10 V       4         -20020 mA and -10 0 10 V       5         7. Auxiliary power supply       4         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 20 357 V / AC 65 253 V       3         DC 20 357 V / AC 65 253 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	415 V (Max. 300 V nominal mains voltage phase-zero)					6					
Special voltage input       9         4. Measuring range       1         Measuring range: please specifyW       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         Special frequency       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 5 mA and 0 10 V       2         4 20 mA and 0 10 V       2         20 5 mA and 0 10 V       4         -20 0 20 mA and -10 0 10 V       5         7. Auxillary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 230 V (195 253 V), (48 62 Hz)       1         DC 20 357 V / AC 65 253 V       4         DC 20 357 V / AC 65 253 V       4         B. Test reports       4         without test report       0	440 V (Max. 300 V nominal mains voltage phase-zero)					7					
Special voltage input       9         4. Measuring range       1         Measuring range: please specifyW       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         Special frequency       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 5 mA and 0 10 V       2         4 20 mA and 0 10 V       2         20 5 mA and 0 10 V       4         -20 0 20 mA and -10 0 10 V       5         7. Auxillary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 230 V (195 253 V), (48 62 Hz)       1         DC 20 357 V / AC 65 253 V       4         DC 20 357 V / AC 65 253 V       4         B. Test reports       4         without test report       0	500 V (Max. 300 V nominal mains voltage phase-zero)					8					
Measuring range:       please specifyW       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       9         5. Frequency       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 5 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       4         - 20 0 20 mA and - 10 0 10 V       4         - 20 0 20 mA and - 10 0 10 V       4         - 20 0 20 mA and - 10 0 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0						9	1				
5. Frequency range       1         4862 Hz (50/60 Hz)       9         5. Frequency       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 5 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       1         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	4. Measuring range										
4862 Hz (50/60 Hz)       1         Special frequency       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxilliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       1         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5	Measuring range: please specify W						1				
Special frequency         9           6. Output         1           0 20 mA and 0 10 V         1           0 10 mA and 0 10 V         2           0 5 mA and 0 10 V         3           4 20 mA and 2 10 V         4           - 20 0 20 mA and - 10 0 10 V         4           - 20 0 20 mA and - 10 0 10 V         4           - 20 0 20 mA and - 10 0 10 V         5           7. Auxiliary power supply         5           AC 230 V (195 253 V), (48 62 Hz)         1           AC 115 V (98 126 V), (48 62 Hz)         1           AC 115 V (98 126 V), (48 62 Hz)         2           DC 24 V (20 72 V)         3           DC 20 100 V / AC 15 70 V         4           DC 90 357 V / AC 65 253 V         5           8. Test reports         5           without test report         0	5. Frequency range										
6. Output       1         0 20 mA and 0 10 V       2         0 10 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5	48 62 Hz (50/60 Hz)							1			
0 20 mA and 0 10 V       1         0 10 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         -20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       3         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	Special frequency							9			
0 10 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       1         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	6. Output										
0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       1         DC 24 V (20 72 V)       3         DC 24 V (20 72 V)       3         DC 90 357 V / AC 65 253 V       4         8. Test reports       5         without test report       0	0 20 mA and 0 10 V								1		
4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       1         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	0 10 mA and 0 10 V								2		
- 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       7. Auxiliary power supply         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	0 5 mA and 0 10 V								3		
7. Auxiliary power supply         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	4 20 mA and 2 10 V								4		
AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	- 20 0 20 mA and - 10 0 10 V								5		
AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0											
AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0										1	
DC 24 V (20 72 V)         3           DC 20 100 V / AC 15 70 V         4           DC 90 357 V / AC 65 253 V         5           8. Test reports         5           without test report         0										2	
DC 20 100 V / AC 15 70 V         4           DC 90 357 V / AC 65 253 V         5           8. Test reports         5           without test report         0										3	
DC 90 357 V / AC 65 253 V         5           8. Test reports         5           without test report         0							4				
8. Test reports       without test report         0	;									-	
without test report 0											
											0
	with test report German_English										1





# **MBg-4.1**

Measuring transducer for reactive power (also suitable for frequency inverters)

### Characteristics/uses

- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715
- Measuring input: Sinusoidal as well as non-sinusoidal voltages and currents on three-phase mains of any curve shape
- Measurement output: Unipolar, live-zero and bipolar output variables, as well as output with zero elevation

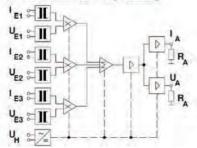
### Application

Measuring transducer for recording the reactive power of a 4-wire three-phase mains with an even phase load. The output signal is a load-independent DC current or imprinted DC voltage signal that is directly proportional to the active power of the primary mains.

### **Functional principle**

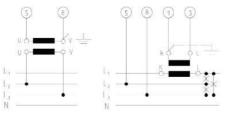
Measuring transducers for active and reactive power operate with an integrated analogue multiplier. The two converters in the current and voltage path galvanically separate the high-current circuits from the electronics and adjust the input current and voltage to the multiplier, which multiplies the measured values in an analogue way and integrates them with a low-pass filter.

	Techr	ical parameters					
Measuring input		Nominal conditions					
Nominal frequency	50 or 60 Hz	Auxiliary voltage	Uнм ±2%, 50 60 Hz				
	Harmonic content ≤ 0.2	Input voltage	Uen ± 0.5%				
Nominal input current IEN	00.5-5 A	Power factor	sin φ = 1.0 0.8				
Input nominal voltage UEN	0 50-519 V	Frequency	50 / 60 Hz				
Intrinsic consumption	approx. 1 mA per voltage path	Waveform	Sine, distortion factor ≤ 0.1%				
	< 0.1 VA per current path at 1 A	Ambient temperature	23°C ±1K				
	< 0.4 VA per current path at 5 A	Warm-up time	≥ 5 min				
Overload capacity	1.2 · UEN or 1.2 IEN, permanent	Auxiliary power supply					
	2 · UEN, 20 IEN max. 1 sec.	AC voltage	230 V~ (-15% +10%); < 7 VA				
Operating voltage	Max. 519 V	-	115 V~ (-15% +10%); < 4 VA				
Measurement output		DC voltage	24 V = (20 72V); < 3 VA				
Nominal current IAN	0 20 mA or 4 20 mA	Wide range	20 100 V= or 15 70V~; < 3 VA				
Load range RA	0 10 V / Ian	AC / DC	90 357 V= or 65 253V~; < 4 7 VA				
Current limitation to approx.	37 mA	General technical data					
Nominal voltage UAN	0 10 V or 2 10 V	Test voltage	All circuits against housing: 3510 Veff 5 sec.				
Load RA	≥ 4 kΩ	-	Measuring circuit and auxiliary voltage against				
Load error	≤ 0.1% at 50% load change	-	Output: 3510 Veff 5 sec.				
Residual ripple	≤ 1%eff	-	currents against each other and against				
Setting time	approx. 500ms	-	Voltage: 3510 Veff 5 sec.				
Open-circuit voltage	≤ 15 V	Working voltage	300 V (nominal mains voltage phase-zero)				
Accuracy		Protection class	IP 40 housing, IP 20 terminals				
Basic accuracy	± 0.5% of the final value	Protection class	II				
Temperature drift	≤ 0.02 %/K	Measurement category	CAT III				
। जे <b>ग</b>		Degree of contamination	2				



Block circuit diagram (example)

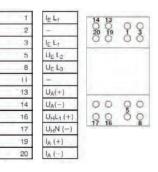




Weight

### Terminal assignment

approx. 270 g



# MBg-4.1 – Measuring transducer for reactive power (also suitable for frequency inverters)

	Order number									
MBg-4.1, measuring transducer for reactive power										
Order No.: PMU17 – xxxxxxxx	PMU	17 -	Х	Х	Х	Х	Х	Х	Х	Х
1. Application										
4-wire three-phase current, even load			1							
2. Current input	•									
1 A primary current please specify				1						
5 A primary current please specify				5						
Special current input				9						
3.Voltage input										
Input voltages Um (AC)										
Please specify translation ratio										
65 V					1					
100 V					2					
110 V					3					
240 V					4					
400 V (Max. 300 V nominal mains voltage phase-zero)					5					
415 V (Max. 300 V nominal mains voltage phase-zero)					6					
440 V (Max. 300 V nominal mains voltage phase-zero)					7					
500 V (Max. 300 V nominal mains voltage phase-zero)					8					
Special voltage input					9					
4. Measuring range										
Measuring range: please specify W						1				
5. Frequency range	•									
48 62 Hz (50/60 Hz)							1			
Special frequency							9			
6. Output										
0 20 mA and 0 10 V								1		
0 10 mA and 0 10 V								2		
0 5 mA and 0 10 V								3		
4 20 mA and 2 10 V								4		
- 20 0 20 mA and - 10 0 10 V								5		
7. Auxiliary power supply										
AC 230 V (195 253 V), (48 62 Hz)									1	
AC 115 V (98 126 V), (48 62 Hz)									2	
DC 24 V (20 72 V)									3	
DC 20 100 V / AC 15 70 V									4	
DC 90 357 V / AC 65 253 V									5	
8. Test reports										
without test report										0
with test report German_English										1



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# MBu-3.1

Measuring transducer for reactive power (also suitable for frequency inverters)

### Characteristics/uses

- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715
- Measuring input: Sinusoidal as well as non-sinusoidal voltages and currents on three-phase mains of any curve shape
- Measurement output: Unipolar, live-zero and bipolar output variables, as well as output with zero elevation

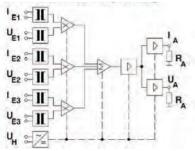
### Application

Measuring transducer for recording the reactive power in a 3-wire three-phase mains with an even or arbitrary phase load. The output signal is a load-independent DC current or imprinted DC voltage signal that is directly proportional to the active power of the primary mains.

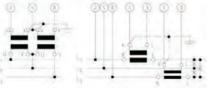
### **Functional principle**

Measuring transducers for active and reactive power operate with an integrated analogue multiplier. The two converters in the current and voltage path galvanically separate the high-current circuits from the electronics and adjust the input current and voltage to the multiplier, which multiplies the measured values in an analogue way and integrates them with a low-pass filter.

	Techni	cal parameters	
leasuring input		Nominal conditions	
ominal frequency	50 or 60 Hz	Auxiliary voltage	Uhn ±2%, 50 60 Hz
	Harmonic content ≤ 0.2	Input voltage	Uen ± 0.5%
ominal input current IEN	00.5-5 A	Power factor	sin φ = 1.0 0.8
Iput nominal voltage UEN	0 50-519 V	Frequency	50 / 60 Hz
trinsic consumption	approx. 1 mA per voltage path	Waveform	Sine, distortion factor ≤ 0.1%
	< 0.1 VA per current path at 1 A	Ambient temperature	23°C ±1K
	< 0.4 VA per current path at 5 A	Warm-up time	≥ 5 min
verload capacity	1.2 · UEN or 1.2 IEN, permanent	Auxiliary power supply	у
	2 · UEN, 20 IEN max. 1 sec.	AC voltage	230 V~ (-15% +10%); < 7 VA
perating voltage	Max. 519 V	-	115 V~ (-15% +10%); < 4 VA
leasurement output		DC voltage	24 V = (20 72V); < 3 VA
ominal current IAN	0 20 mA or 4 20 mA	Wide range	20 100 V= or 15 70V~; < 3 VA
oad range RA	0 10 V / Ian	AC / DC	90 357 V= or 65 253V~; < 4 7 VA
urrent limitation	to approx. 37 mA	General technical data	
ominal voltage UAN	0 10 V or 2 10 V	Test voltage	All circuits against housing: 3510 Veff 5 sec.
oad RA	≥ 4 kΩ	-	Measuring circuit and auxiliary voltage against
oad error	≤ 0.1% at 50% load change	-	Output: 3510 Veff 5 sec.
esidual ripple	≤ 1%eff	-	currents against each other and against
etting time	approx. 500ms	-	Voltage: 3510 Veff 5 sec.
pen-circuit voltage	≤ 15 V	Working voltage	300 V (nominal mains voltage phase-zero)
ccuracy		Protection class	IP 40 housing, IP 20 terminals
asic accuracy	± 0.5% of the final value	Protection class	II
emperature drift	≤ 0.02 %/K	Measurement category	CAT III
		Degree of contamination	1 2



Connections



Weight

### Terminal assignment

approx. 290 g



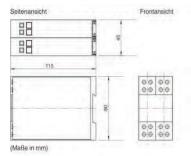
# Block circuit diagram (example)

# MBu-3.1 – Measuring transducer for reactive power

# (also suitable for frequency inverters)

	Order number									
MBu-3.1, measuring transducer for reactive power										
Order No.: PMU16 – xxxxxxxx	PMU	16	Х	Х	Х	Х	Х	Х	Х	Х
1. Application										
3-wire three-phase current, arbitrary load			1							
2. Current input										
1 A primary current please specify				1						
5 A primary current please specify				5						
Special current input				9	1					
3.Voltage input										
Input voltages Um (AC)										
Please specify translation ratio										
65 V					1					
100 V					2					
110 V					3					
240 V					4					
400 V (Max. 300 V nominal mains voltage phase-zero)					5					
415 V (Max. 300 V nominal mains voltage phase-zero)					6					
440 V (Max. 300 V nominal mains voltage phase-zero)					7					
500 V (Max. 300 V nominal mains voltage phase-zero)					8					
Special voltage input					9					
4. Measuring range										
Measuring range: please specify W						1				
5. Frequency range										
48 62 Hz (50/60 Hz)							1			
Special frequency							9			
6. Output	•									
0 20 mA and 0 10 V								1		
0 10 mA and 0 10 V								2		
0 5 mA and 0 10 V								3		
4 20 mA and 2 10 V								4		
- 20 0 20 mA and - 10 0 10 V								5		
7. Auxiliary <b>power supply</b>										
AC 230 V (195 253 V), (48 62 Hz)									1	
AC 115 V (98 126 V), (48 62 Hz)									2	
DC 24 V (20 72 V)									3	
DC 20 100 V / AC 15 70 V									4	
DC 90 357 V / AC 65 253 V									5	
8. Test reports										
without test report										0
with test report German_English										1





## **MBu-4.1**

Measuring transducer for reactive power (also suitable for frequency inverters)

#### Characteristics/uses

- Sinusoidal as well as non-sinusoidal voltages and currents on threephase mains of any curve shape
- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715
- Measurement output: Unipolar, live-zero and bipolar output variables, as well as output with zero elevation

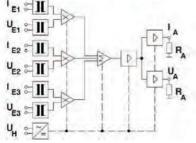
#### Application

Measuring transducer for recording the reactive power of a 4-wire three-phase mains with an even or arbitrary phase load. The output signal is a load-independent DC current or imprinted DC voltage signal that is directly proportional to the active power of the primary mains.

#### **Functional principle**

Measuring transducers for active and reactive power operate with an integrated analogue multiplier. The two converters in the current and voltage path galvanically separate the high-current circuits from the electronics and adjust the input current and voltage to the multiplier, which multiplies the measured values in an analogue way and integrates them with a low-pass filter.

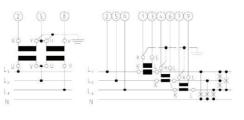
	Techn	ical parameters	
Measuring input		Nominal conditions	
Nominal frequency	50 or 60 Hz	Auxiliary voltage	Uhn ±2%, 50 60 Hz
	Harmonic content ≤ 0.2	Input voltage	Uen ± 0.5%
Nominal input current IEN	00.5-5 A	Power factor	sin φ = 1.0 0.8
Input nominal voltage UEN	0 50-519 V	Frequency	50 / 60 Hz
Intrinsic consumption	approx. 1 mA per voltage path	Waveform	Sine, distortion factor ≤ 0.1%
	< 0.1 VA per current path at 1 A	Ambient temperature	23°C ±1K
	< 0.4 VA per current path at 5 A	Warm-up time	≤ 5 min
Overload capacity	1.2 · UEN or 1.2 IEN, permanent	Auxiliary power supply	
	2 · UEN, 20 IEN max. 1 sec.	AC voltage	230 V~ (-15% +10%); < 7 VA
Operating voltage	max. 519 V	-	115 V~ (-15% +10%); < 4 VA
Measurement output		DC voltage	24 V = (20 72V); < 3 VA
Nominal current IAN	0 20 mA or 4 20 mA	Wide range	20 100 V= or 15 70V~; < 3 VA
Load range RA	0 10 V / Ian	AC / DC	90 357 V= or 65 253V~; < 4 7 VA
Current limitation	to approx. 37 mA	General technical data	
Nominal voltage UAN	0 10 V or 2 10 V	Test voltage	All circuits against housing: 3510 Veff 5 sec.
Load RA	≥ 4 kΩ	-	Measuring circuit and auxiliary voltage against
Load error	≤ 0.1% at 50% load change	-	Output: 3510 V <sub>eff</sub> 5 sec.
Residual ripple	≤ 1%eff	-	currents against each other and against
Setting time	approx. 500ms	-	Voltage: 3510 Veff 5 sec.
Open-circuit voltage	≤ 15 V	Working voltage	300 V (nominal mains voltage phase-zero)
Accuracy		Protection class	IP 40 housing, IP 20 terminals
Basic accuracy	± 0.5% of the final value	Protection class	II
Temperature drift	≤ 0.02 %/K	Measurement category	CAT III
। जग		Degree of contamination	2



Block circuit diagram (example)



Weight



### Terminal assignment

IE Lt

2 U<sub>E</sub> L 3 I<u>E</u> L 4 I<u>E</u> L<sub>2</sub>

U<sub>E</sub> L<sub>2</sub>

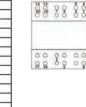
7 I<sub>E</sub> L<sub>3</sub> 8 U<sub>E</sub> L<sub>3</sub>

UHN (

9 l<u>E</u>L<sub>3</sub> 11 -13 U<sub>A</sub>(+)

14 UA(

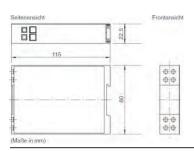
approx. 310 g



# MBu-4.1 – Measuring transducer for reactive power (also suitable for frequency inverters)

MBu 41. measuring transducer for reactive power     PMU     18     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X     X <thx< th=""><th></th><th colspan="7">Order number</th><th></th></thx<>		Order number									
1. Application       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1	MBu-4.1, measuring transducer for reactive power										
4-wire three-phase current, arbitrary load       1       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I	Order No.: PMU18 – xxxxxxxx	PMU	18 -	Х	Х	Х	Х	Х	Х	Х	Х
2. Current Input       1         1 A primary current please specify       5         Special current input       9         3. Voltage input       9         100 V       1         65 V       1         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         5 - Frequency range       9         4. Measuring range       1         5. Frequency range       1         5. Frequency range       9         6. Output       1         0 20 mA and 0 10 V       1         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         -2 0 0 0 0 0 10 V       5         -3. Auxiliary power supply       1         Ac 230 V (195 253 V), (48 62 Hz)       1         -2. 0 0 0 0 0 10 V       2         0 35 M.	1. Application										
1 A primary current please specify       1         5 A primary current input       9         3. Voltage input       9         3. Voltage input       9         100 V       1         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         415 V (Max. 300 V nominal mains voltage phase-zero)       6         416 V (Max. 300 V nominal mains voltage phase-zero)       6         5 Special voltage input       9         400 V (Max. 300 V nominal mains voltage phase-zero)       8         5 Special voltage input       9         4. Measuring range:       1         5. Frequency range       1         48 62 Hz (S0/60 Hz)       1         5. Frequency range       9         6. Output       1         0 10 mA and 0 10 V       2         0 20 mA and 0 10 V       2         0 20 mA and 1.0 10 V       3         4 20 m. and 2 10 V       3         4 22 m. 0 20 mA and 1.0 0 10 V       5         7. Auxillary power supply       2 <td< td=""><td>4-wire three-phase current, arbitrary load</td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	4-wire three-phase current, arbitrary load			1							
5 A primary current please specify       5         Special current input       9         Input voltages lum (AC)       9         Please specify translation ratio	2. Current input	•									
Special current input       9         3. Voltage input         Input voltages und (C)         Please specify translation ratio         65 V       1         100 V       2         100 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       6         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       1         Measuring range       1         5. Frequency range       1         48621 k2 (50/60 Hz)       1         5. Special requency       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       3         4	1 A primary current please specify				1						
3. Voltage input         Input voltages Um (AC)         Please specify translation ratio         100 V       2         11       2         100 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       6         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         Measuring range       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         5. Frequency range       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       5         7. Auxillary power supply       4         AC 203 V (195 253 V), (48 62 Hz)       1         AC 215 V (20 72 V)       3         DC 24 126 V), (48 62 Hz)       2         DC 24 120 V, Ac 15 70 V       3         DC 20 100 V/Ac 15 70 V       3         D	5 A primary current please specify				5						
Input voltages Um (AC)         Please specify translation ratio         65 V       1         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       6         415 V (Max. 300 V nominal mains voltage phase-zero)       6         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         5pecial voltage input       9         4. Measuring range:       9         4. Measuring range:       1         5. Frequency range       1         5. Frequency range       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       2         20 0 20 mA and 1.0 0 10 V       5         7. Auxillary power supply       3         42. C23 V (125 253 V), (48 62 Hz)       1         7. Auxillary power supply       2         7. Auxillary power supply       2         7. Auxillary power supply       2         72 0 0 20	Special current input				9						
Please specify translation ratio       1         65 V       1         100 V       2         100 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         415 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         5 pecial voltage input       9         4. Measuring range:       1         5. Frequency range       1         5. Frequency range       9         6. Output       1         5. Special frequency       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       3         4	3.Voltage input										
65 V       1         100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         5pecial voltage input       9         4. Measuring range       9         4. Measuring range       1         5. Frequency range       9         48 62 Hz (S0/60 Hz)       1         5. Frequency range       9         6. Output       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       3         4 20 mA and 2 10 V       4         -20 mA and 2 10 V       4         -20 mA and 2 10 V       2         0 5 mA and 0 10 V       2         0 0 mA and 2 10 V       3         4 20 mA and 2 10 V       2         5 5 T.       7. AuxIlliary power supply         <	Input voltages Um (AC)										
100 V       2         110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       1         Measuring range       1         5. Frequency range       1         5. Frequency range       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       3         4 20 mA and 0 10 V       4         -20 0 20 mA and -10 0 10 V       2         0 5 mA and 0 10 V       4         -20 0 20 mA and -10 0 10 V       5         7. AuxIllary power supply       2         Ac 215 V (98 126 V), (48 62 Hz)       1         Ac 215 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 45 .	Please specify translation ratio										
110 V       3         240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         Keasuring range       1         Special voltage input       9         48 62 Hz (S0/60 Hz)       1         Special frequency range       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       3         4 20 mA and 2 10 V       4         -20 0 20 mA and -10 0 10 V       5         7. Auxillary power supply       4         AC 230 V (195 253 V), (48 62 Hz)       2         AC 240 V (20 72 V)       3         DC 20 100 V / AC 65 253 V       5         8. Test reports       4	65 V					1					
240 V       4         400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         4. Measuring range       1         5. Frequency range       1         5. Frequency range       9         48 62 Hz (50/60 Hz)       1         Special frequency       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       3         4 20 mA and 2 10 V       4         -20 0 20 mA and 10 0 10 V       5         7. Auxilliary power supply       4         AC 115 V (98 126 V), (48 62 Hz)       1         AC 20 0 20 W, (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report	100 V					2					
400 V (Max. 300 V nominal mains voltage phase-zero)       5         415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         4. Measuring range       1         5. Frequency range       1         5. Frequency range       9         6. Output       1         5. Output       1         5. Output       1         5. Output       1         5. Output       1         6. Output       2         0 20 mA and 0 10 V       1         0 5 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         -20 0 20 mA and 10 0 10 V       5         7. Auxiliary power supply       4         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       1         AC 21 00 V / AC 15 70 V       3         DC 20 100 V / AC 15 70 V       4         DC 20 100 V / AC 15 70 V       4 <td>110 V</td> <td></td> <td></td> <td></td> <td></td> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td>	110 V					3					
415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       1         Measuring range:       1         Special voltage input       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         Special frequency       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       3         4 20 mA and 1.0 0 10 V       3         4 20 mA and 1.0 0 10 V       5         7. Auxiliary power supply       4         AC 230 V (195 253 V), (48 62 Hz)       1         AC 210 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 20 357 V / AC 65 253 V       5         8. Test reports       5         8. Test reports       5	240 V					4					
415 V (Max. 300 V nominal mains voltage phase-zero)       6         440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       9         Measuring range:       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       3         4 20 mA and 10 0 W       3         -20 0 20 mA and 0 10 V       4         -20 0 20 mA and 0 10 V       4         -20 0 20 mA and 0 10 V       2         0 5 mA and 0 10 V       3         -20 0 20 mA and 10 0 10 V       4         -20 0 20 mA and -10 0 10 V       5         7. Auxiliary power supply       2         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 20 100 V / AC 15 70 V       3	400 V (Max. 300 V nominal mains voltage phase-zero)					5	1				
440 V (Max. 300 V nominal mains voltage phase-zero)       7         500 V (Max. 300 V nominal mains voltage phase-zero)       8         Special voltage input       9         4. Measuring range       1         Measuring range:       1         5. Frequency range       1         48 62 Hz (S0/60 Hz)       1         Special frequency       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       3         4 20 mA and 10 10 V       3         4 20 mA and 10 10 V       4         -20 0 20 mA and -10 0 10 V       5         7. Auxiliary power supply       4         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5						6					
Special voltage input       9         4. Measuring range       1         Measuring range:       1         5. Frequency range       1         4862 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         020 mA and 0 10 V       1         020 mA and 0 10 V       2         05 mA and 0 10 V       3         420 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxillary power supply       5         7. Auxillary power supply       1         AC 230 V (195 253 V), (48 62 Hz)       1         AC 230 V (195 253 V), (48 62 Hz)       1         AC 230 V (195 253 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 357 V / AC 65 253 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	440 V (Max. 300 V nominal mains voltage phase-zero)					7	1				
4. Measuring range       1         Measuring range:       please specifyW       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       3         - 20 0 20 mA and - 10 0 10 V       4         - 20 0 20 mA and - 10 0 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxillary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 230 V (195 253 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	500 V (Max. 300 V nominal mains voltage phase-zero)					8					
Measuring range:       please specifyW       1         5. Frequency range       1         48 62 Hz (50/60 Hz)       1         Special frequency       9         6. Output       9         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and 1 0 10 V       5         7. Auxiliary power supply       5         AC 215 V (98 126 V), (48 62 Hz)       1         AC 215 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 24 V (20 72 V)       3         DC 24 V (20 72 V)       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5	Special voltage input					9					
5. Frequency range       1         4862 Hz (50/60 Hz)       9         5. Output       9         6. Output       1         0 20 mA and 0 10 V       1         0 20 mA and 0 10 V       2         0 5 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 215 V (98 126 V), (48 62 Hz)       1         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5	4. Measuring range										
4862 Hz (50/60 Hz)       1         Special frequency       9         6. Output       1         0 20 mA and 0 10 V       2         0 20 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 230 V (195 253 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5	Measuring range: please specifyW						1				
Special frequency       9         6. Output       1         0 20 mA and 0 10 V       1         0 10 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	5. Frequency range							1			
6. Output       1         0 20 mA and 0 10 V       2         0 10 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 ma and 2 10 V       4         - 20 mA and 2 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5	48 62 Hz (50/60 Hz)							1			
6. Output       1         0 20 mA and 0 10 V       2         0 10 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 ma and 2 10 V       4         - 20 mA and 2 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5	Special frequency							9			
0 10 mA and 0 10 V       2         0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0											
0 5 mA and 0 10 V       3         4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       3         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	0 20 mA and 0 10 V								1		
4 20 mA and 2 10 V       4         - 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	0 10 mA and 0 10 V								2		
- 20 0 20 mA and - 10 0 10 V       5         7. Auxiliary power supply       5         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	0 5 mA and 0 10 V								3		
7. Auxiliary power supply       1         AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	4 20 mA and 2 10 V								4	1	
AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	- 20 0 20 mA and - 10 0 10 V								5		
AC 230 V (195 253 V), (48 62 Hz)       1         AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	7. Auxiliary <b>power supply</b>										
AC 115 V (98 126 V), (48 62 Hz)       2         DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0	3 · · · ·									1	
DC 24 V (20 72 V)       3         DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0										2	
DC 20 100 V / AC 15 70 V       4         DC 90 357 V / AC 65 253 V       5         8. Test reports       5         without test report       0										3	
DC 90 357 V/AC 65 253 V         5           8. Test reports         5           without test report         0										4	
8. Test reports       without test report         0										5	
without test report 0											
	1										0
	with test report German_English										1





# MA-G.1

Measuring transducer for direct current

### Characteristics/uses

- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715 •
- Measuring input: Direct current
- Measurement output: Unipolar, live-zero and bipolar output variables, as • well as output with zero elevation

### Application

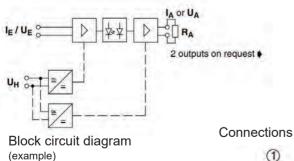
The measuring transducers convert currents into an load-independent DC current or an imprinted DC voltage with the correct sign. These can then be displayed, registered and/or used for control at the measurement location or in more distant control rooms.

### **Functional principle**

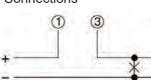
The current is measured internally via a shunt resistor. After this, the signal is galvanically isolated from the input via an optical path and converted into a proportional imprinted DC voltage or a proportional load-independent DC current.

### **Technical parameters**

Measuring input		Nominal conditions	
Nominal input current IN	200 µA – 5 A	Auxiliary voltage	UHN ±5 %, 50 Hz with AC
Intrinsic consumption	IE • 0.1 V	Load	0.5 RA max. ±1% with current output
Overload capacity	1.2 · IEN permanent		RA min ±1% with voltage output
	10 · IEN max. 1 sec	Ambient temperature	23°C ±1K
Operating voltage	max. 519 V	Warm-up time	≥ 5 min
	max. 300 V phase zero	Auxiliary power supply	
Measurement output		AC voltage	230 V~ (-15% +10%); < 6 VA 115 V~ (-15% +10%); < 3.5 VA
Nominal current IAN	0 20 mA or 4 20 mA	DC voltage	24 V = (20 72V); < 3 VA
Load range RA	0 12 V / IAN	Wide range	20 100 V= or 15 70V~; < 3 VA
Current limitation	to 120 150% of the final value	AC / DC	90 357 V= or 65 253V~; < 3 6 VA
Nominal voltage UAN	0 10 V or 2 10 V	General technical data	
Load RA	≥ 4 kΩ	Test voltage	2210 V all circuits against housing
Load error	≤ 0.1% at 50% load change		3536 V all circuits to each other
Residual ripple	≤ 1%eff	Working voltage	300 V (nominal mains voltage phase-zero)
Setting time	approx. 500ms, 250ms, 100ms	Protection class	IP 40 housing, IP 20 terminals
Open-circuit voltage	≤ 15 V	Protection class	II
Accuracy		Measurement category	CAT III
Basic accuracy	± 0.5% of the final value	Degree of contamination	2
Temperature drift	≤ 0.02 %/K	Weight	approx. 120 g







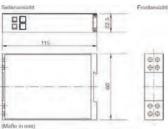
### Terminal assignment

pg	pg	T.	Function	T.	Function
90	apl	1	IE (+)		single output:
1420 19 13	14 20 1913	3	IE (-)	19	UA. IA (+)
1000 0000		2	UE (+)	20	UA, 1A (-)
nput	voltage	5	UE ()		dual output:
17 1 3 16	17 2 5 16	16	U <sub>H</sub> L1(+)	13	UA (+)
โสโกไ	1751	17	U <sub>H</sub> N (-)	14	UA (-)
621	621			19	IA (+)
00	00			20	IA (-)
E currer	nt input e input			IA UA	current output voltage output
J <sub>H</sub> auxilia	ary voltage	input			
The termin	nal numbe	ring co	prrespond to d	etails	

# MA-G.1 – Measuring transducer for direct current

Characteristics				0	der nu	mber			
MA-G.1, measuring transducer for direct current									
Order No. IMU28 - xxxxxx	IMU	28 –	Х	Х	х	х	Х	Х	х
1. Nominal input current									
0 200 μΑ			1						
0 20 mA			2						
0 0.5 A			3						
0 1 A			4						
0 2 A			5						
-5 0 +5 A			6						
Special range up to ± 5 A			9			1			
2. Frequency range input									
DC				0					
3. Output									
0 20 mA					1				
4 20 mA					2				
0 10 V					3				
2 10 V					4				
0 20 mA and 0 10 V					5				
4 20 mA and 2 10 V					6	1			
Special ranges					9	1			
0 10 mA					Α				
0 5 A					В				
-20 0 20 mA					С	1			
-10 0 10 V					D	1			
-20 0 20 mA and -10 0 10 V					E				
according to specification					Z				
4. Accuracy					1	•			
± 0.5% of the final value						1	1		
± 0.2% of the final value						2			
5. Setting time									
500 ms							1		
250 ms							2		
100 ms							3		
6. Auxiliary <b>power supply</b>									
AC 230 V (195 253 V), (48 62 Hz)								1	
AC 115 V (98 126 V), (48 62 Hz)								2	1
DC 24 V (20 72 V)								3	
DC 20 100 V / AC 15 70 V								4	
DC 90 357 V / AC 65 253 V								5	
7. Test reports									
without test report									0
with test report German_English									1





# MV-G.1

Measuring transducer for DC voltage

### Characteristics/uses

- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715 •
- Measuring input: DC voltage .
- Measurement output: Unipolar, live-zero and bipolar output variables, as . well as output with zero elevation

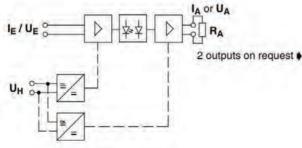
#### Application

The measuring transducers convert voltages into an load-independent DC current or an imprinted DC voltage with the correct sign. These can then be displayed, registered and/or used for control at the measurement location or in more distant control rooms.

#### **Functional principle**

The voltage is measured internally via a voltage divider. After this, the signal is galvanically isolated from the input via an optical path and converted into a proportional imprinted DC voltage or a proportional load-independent DC current.

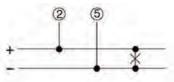
Measuring input		Nominal conditions	
Nominal frequency fN	4862 Hz	Auxiliary voltage	Uнм ±5 %, 50 Hz with AC
Input nominal voltage UEN	Uen = 60 mV - 300 V	Load	0.5 RA max. ±1% with current output
Intrinsic consumption	Ue <sup>2</sup> / Re		R <sub>A</sub> min ±1% with voltage output
Overload capacity	1.2 · UEN permanent	Ambient temperature	23°C ±1K
	2 · UEN max. 1 sec.	Warm-up time	≥5 min
Operating voltage	max. 300 V	Auxiliary power supply	
Measurement output		AC voltage	230 V~ (-15% +10%); < 6 VA
Nominal current IAN	0 20 mA or 4 20 mA		115 V~ (-15% +10%); < 3.5 VA
Load range RA	0 12 V / IAN	DC voltage	24 V = (20 72V); < 3 VA
Current limitation	to 120 150% of the final value	Wide range	20 100 V= or 15 70V~; < 3 VA
Nominal voltage UAN	0 10 V or 2 10 V	AC / DC	90 357 V= or 65 253V~; < 3 6 VA
Load RA	≥ 4 kΩ	General technical data	
Load error	≤ 0.1% at 50% load change	Test voltage	2210 V all circuits against housing
Residual ripple	≤ 1%eff		3536 V all circuits to each other
Setting time	approx. 500ms	Working voltage	300 V (nominal mains voltage phase-zero)
Open-circuit voltage	≤ 15 V	Protection class	IP 40 housing, IP 20 terminals
Accuracy		Protection class	II
Basic accuracy	± 0.5% of the final value	Measurement category	CAT III
Temperature drift	≤ 0.02 %/K	Degree of contamination	2
		Weight	approx. 120 g



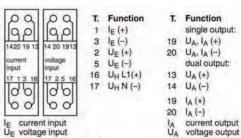
Block circuit diagram (example)



Connections



### Terminal assignment (for all types)



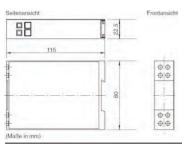
U<sub>H</sub> auxiliary voltage input

The terminal numbering correspond to details in the connection diagrams (to DIN 43 807).

# MV-G.1 – Measuring transducer for direct current

Characteristics	Order number								
MV-G.1, measuring transducer for DC voltage							1	1	1
Order No. UMU30 - xxxxxx	UMU	30 -	Х	х	х		х	Х	х
1. Nominal input current									
0 60 mV			1						
01V			2						
0 10 V			3						1
0 115 V			4						
0 230 V			5						
Special range up to ± 300 V			9						
2. Frequency range input									
DC				0					
3. Output	1								
0 20 mA					1				
4 20 mA					2				
0 10 V					3				
2 10 V					4				
0 20 mA and 0 10 V					5				
4 20 mA and 2 10 V					6				
Special ranges					9				
0 10 mA					Α				
0 5 A					В				
-20 0 20 mA					С				
-10 0 10 V					D				
-20 0 20 mA and -10 0 10 V					E				
according to specification					Z				
4. Accuracy									
± 0.5% of the final value						1			
± 0.2% of the final value						2			
5. Setting time									
500 ms							1		
250 ms							2		
100 ms							3		
6. Auxiliary <b>power supply</b>									
AC 230 V (195 253 V), (48 62 Hz)								1	
AC 115 V (98 126 V), (48 62 Hz)								2	
DC 24 V (20 72 V)								3	
DC 20 100 V / AC 15 70 V								4	
DC 90 357 V / AC 65 253 V								5	
7. Test reports									
without test report									0
with test report German_English									1





# **NT-G.1**

### Measuring transducer for DC standard signals

### Characteristics/uses

- With auxiliary power supply •
- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715 •
- Measuring input: Direct current and direct voltage •
- Measurement output: Unipolar, live-zero and bipolar output variables, as well as output with zero elevation

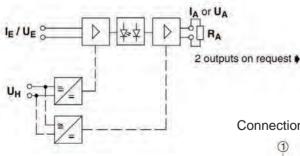
### Application

The isolation amplifier detects a standard signal (direct current 0/4 ... 20 mA or DC voltage 0 /2 ... 10 V), amplifies it with galvanic isolation and converts it into a load-independent DC current signal or an imprinted DC voltage signal.

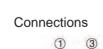
### **Functional principle**

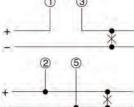
The current measurement is carried out internally via a shunt resistor, the voltage measurement via a voltage divider. After this, the signal is galvanically isolated from the input via an optical path and converted into a proportional imprinted DC voltage or a proportional load-independent DC current.

	Те	echnical parameters	
Measuring input		Nominal conditions	
Input parameter	I <sub>EN</sub> = 0 20 mA, 4 20 mA	Auxiliary voltage	Uнм ±5 %, 50 Hz with AC
	Uen = 0 10 V, 2 10 V	Load	0.5 RA max. ±1% with current output
Intrinsic consumption	IE • 0.1 V		RA min ±1% with voltage output
Overload capacity	1.2 · IEN permanent	Ambient temperature	23°C ±1K
	2 · IEN max. 1 sec.	Warm-up time	≥5 min
Operating voltage	Max. 300 V	Auxiliary power supply	
Measurement output		AC voltage	230 V~ (-15% +10%); < 6 VA
Nominal current IAN	0 20 mA or 4 20 mA		115 V~ (-15% +10%); < 3.5 VA
Load range RA	0 12 V / Ian	DC voltage	24 V = (20 72V); < 3 VA
Current limitation	to 120 150% of the final value	Wide range	20 100 V= or 15 70V~; < 3 VA
Nominal voltage UAN	0 10 V or 2 10 V	AC / DC	90 357 V= or 65 253V~; < 3 6 VA
Load RA	≥ 4 kΩ	General technical data	
Load error	≤ 0.1% at 50% load change	Test voltage	2210 V all circuits against housing
Residual ripple	≤ 1%eff		3536 V all circuits to each other
Setting time	approx. 500ms, 250ms, 100ms	Working voltage	300 V (nominal mains voltage phase-zero)
Open-circuit voltage	≤ 15 V	Protection class	IP 40 housing, IP 20 terminals
Accuracy		Protection class	ll
Basic accuracy	± 0.5% of the final value	Measurement category	CAT III
Temperature drift	≤ 0.02 %/K	Degree of contamination	2
		Weight	approx. 120 g

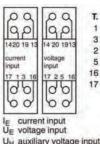


Block circuit diagram (example)

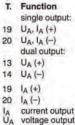




## Terminal assignment (for all types)



	Function
	IE (+)
3	IE (-)
2	UE (+)
5	UE (-)
16	U <sub>H</sub> L1(+)
17	U <sub>H</sub> N (-)



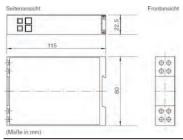
voltage output

 $U_{\rm H}$  auxiliary voltage input The terminal numbering correspond to details in the connection diagrams (to DIN 43 807).

# NT-G.1 – Measuring transducer for DC standard signals

Characteristics	Order number								
NT-G.1, measuring transducer for DC standard signals									
Order No. NMU31 - xxxxxx	NMU	31 –	Х	х	х		х	х	х
1. Nominal input current									
0 20 mA			1						
0 10 V			2						
4 20 mA			3						
2 10 V			4						
0 60 mV			5						
2. Frequency range input		I	-	I		I			I
DC				0	1				
3. Output	1			-	1				
0 20 mA					1				
4 20 mA					2				
0 10 V					3				
2 10 V					4				
0 20 mA and 0 10 V					5				
4 20 mA and 2 10 V					6				
Special ranges					9				
0 10 mA					A				
0 5 mA					В				
-20 0 20 mA					C				
-10 0 10 V					D				
-20 0 20 mA and -10 0 10 V					E				
according to specification					Z				
4. Accuracy						:			
± 0.5% of the final value						1	[		
± 0.2% of the final value						2			
5. Setting time						1			
500 ms							1		
250 ms							2		
100 ms	-						3		
6. Auxiliary power supply							-		
AC 230 V (195 253 V), (48 62 Hz)								1	
AC 115 V (98 126 V), (48 62 Hz)								2	
DC 24 V (20 72 V)								3	
DC 20 100 V / AC 15 70 V								4	
DC 90 357 V / AC 65 253 V	5								
7. Test reports									
without test report									0
with test report German_English									1





# Mt-G.oH

Isolating transducer for standard signals without auxiliary energy

### Characteristics/uses

- Without auxiliary power supply
- Surface-mounted housing for top-hat rail TH 35 according to DIN EN 60 715
  - Measuring input: Direct current
- Measurement output: Unipolar, live-zero and bipolar output parameters, as well as output with direct current

### Application

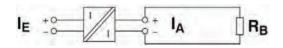
The isolating transducer detects a standard direct current (0 ... 20 mA) and converts it back into a **galvanically isolated** load-independent DC current.

### **Functional principle**

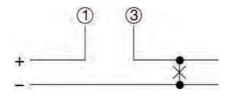
Input and output current are galvanically isolated from each other without additional auxiliary energy. The energy required for this is extracted from the input signal. The input resistance is therefore dependent on the input current and the connected load resistance RB.

Technical parameters		
Measuring input		
Input parameter IEN	IEN = 20 mA	
Intrinsic consumption	2.4 V at 20 mA	
Overload capacity	Max. 2 IEN permanent	
Measurement output		
Nominal current IAN	0 20 mA	
Load range R <sub>A</sub>	0 500 Ω	
Accuracy		
Basic accuracy	±0.2% (at 0 IEN)	
Temperature drift	≤ 0.03 %/K	
Nominal conditions		
Load	250 Ω ± 1%	
Ambient temperature	23°C ±1K	
Warm-up time	≥ 5 min	
Test voltage	2210 V all circuits against housing	
Protection class	3536 V Measuring circuit against output	
	IP 40 housing, IP 20 terminals	
Protection class	II	
Measurement category	CAT III	
Degree of contamination	2	
Weight	approx. 120 g	

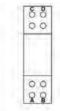
### Bock circuit diagram



### Connections



## Terminal assignment



A	1	I <sub>E</sub> (+)
В	3	I <sub>E</sub> ()
C		I <sub>A</sub> (+)
D		I <sub>A</sub> (-)
E		-
F		+
G		-
H		÷
E		Current input
A		Current output

# Mt-G.oH – Measuring transducer for standard signals without auxiliary energy

Characteristics	Order number							
Mt-G.oH, measuring transducer for standard signals without								
auxiliary energy	NMU	32 –	Х	Х	Х	Х		
Order No. NMU32 - xxxxxx								
1. Application								
0 20 mA for 1 standard signal			1					
2. Input measuring range								
0 20 mA				Α				
3. Output								
0 20 mA			1					
4. Test reports								
without test report						0		
with test report German_English						1		

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