Measuring transducer

with digital output
via Modbus RTU / RS 485

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MTI

Measuring transducer for sinusoidal and non-sinusoidal alternating current with digital output via Modbus RTU / RS 485

Characteristics / uses

- Measuring output as double output, switchable: 0(4)…20 mA und 0(2)…10 V
- With auxillary power supply
- Housing for 35 mm DIN rail
- Measuring output: Unipolar and live-zero output variables
- AC oder DC auxillary energy
- Measuring range and outputs easily switchable via dip switch

Application

Measuring transducer for the conversion of sinusoidal and non-sinusoidal alternating (distorted) current. As output signal is a load-independent DC current signal and a load-independent voltage signal, which is proportional to the measured value of the input variable. Both outputs are switchable between 4…20 mA and 0…10 V or 2… 10 V.

Technical parameters

Measuring input	
Nominal frequency f_N	50 Hz or 60Hz
Nominal input current I_N	0…1 A or 0…5 A switchable Higher currents on request
Measuring range	0…1,2 A or 0…6 A
Burden	0,01 Ω
Overload capacity	2 · I_N, permanent 20 · I_N, 1 sec.
Measuring output 0(4)…20 mA	
Load-independent DC (0…1,2 A or 0…6 A)	0…24 mA / 750 Ω Burden or live-zero 4…23,2 mA / 750 Ω Burden
Load-independent DC at I_N max.	20 mA / 750 Ω Bürde
Open-circuit voltage	max. 22 V
Current limitation	max. 25 mA on overload
Measuring output 0(2)…10 V	
Imprinted DC voltage (0…1,2 A or 0…6 A)	0…12 V / ≥ 10 kΩ Burden or live-zero 2…11,6 V / ≥ 10 kΩ Burden
Imprinted DC voltage at I_N max.	10 V / ≥ 10 kΩ Burden
Voltage limitation	12,5 V bei Überlast
Residual ripple	< 10 mVpp
Setting time	< 200 ms
Frequency influence	< 0,05 % at 10 Hz Frequency change
External field influence	no (400 A/m)
Digital interface	
Protocol	Modbus RTU
Electrical	RS 485
Line length	max. 30m, shielded from 3m (non-interbuilding)
Accuracy	
Basic accuracy	± 0,5 % at 0 – 120 % of the final value I_N

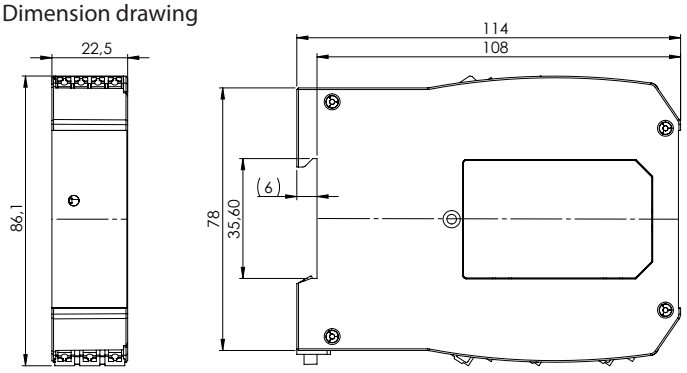
Temperature range	-20°C to +70°C
Temperature influence	< 0,05 % at 10 K
Humidity	10-70 % rel. humidity, non condensing
Auxiliary energy	
AC voltage	100…277 V AC, 47-63 Hz condensing
DC voltage	24 V DC, ± 15%
Auxiliary voltage influence	no
Internal consumption	< 1,4 W @ 24 V DC < 2 VA @ 230 V AC
Waveform	Non-sinusoidal, Crestfactor < 4
Safety	
Test voltage	4 kV between input, output, auxiliary voltage 230 V AC or 1 kV for auxiliary voltage 24 V DC
Weight	ca. 110 g
General technical data	
Protection class	2
Protection type	IP 20
Measuring category	CAT III
Degree of polution	2
Switchable via dip switch	
1: DIP active / inactive	OFF = Setting acc. to Modbus ON = Setting acc. to DIP 2,3,4
2: Measuring range	OFF = 1 A ON = 5 A
3: Measuring output voltage	OFF = 0 … 10 V ON = 2…10 V
4: Measuring output current	OFF = 0…20 mA ON = 4…20 mA

Dip switch backside

Dip switch

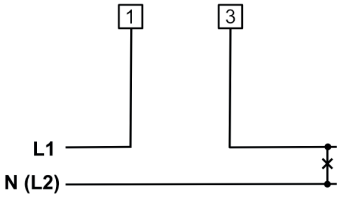
MTI Dimension drawing

Dimension drawing

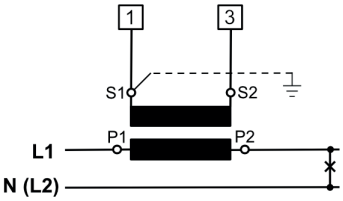


MTI Connecting diagram

Direct switching



Transducer circuit



MTI Terminal assignment

Terminal	
1	I_E
3	I_E
7	UH L1 (+)
9	UH N (-)
18	U_A (+)
19	U_A (-)
20	I_A (+)
21	I_A (-)
Modbus RTU	
14	D+
15	D-
16	GND

Order table

		Measurement output / adjusted				Setting via 4-pole DIP switch
Auxiliary voltage U_H	Primary current (A)	0...10 V and 0...20 mA	0...10 V and 4...20 mA	2...10 V and 0...20 mA	2...10 V and 4...20 mA	
230 V	1 A	225101	225102	225103	225104	225100
	5 A	225105	225106	225107	225108	
24 V	1 A	225201	225202	225203	225204	225200
	5 A	225205	225206	225207	225208	

MTU

Measuring transducer for sinusoidal and non-sinusoidal alternating Voltage with digital output via Modbus RTU / RS 485

Characteristics / uses

- Measuring output as double output, switchable: 0(4)…20 mA and 0(2)…10 V
- With auxiliary power supply
- Housing for 35 mm DIN rail
- Measuring output: Unipolar and live-zero output variables
- AC or DC auxiliary energy
- Measuring range and outputs easily switchable via dip switch

Application

Measuring transducer for the conversion of sinusoidal and non-sinusoidal alternating (distorted). As output signal is a load independent DC current signal and a load-independent voltage signal, which is proportional to the measured value of the input variable. Both outputs are switchable between 4…20 mA and 0…10 V or 2… 10 V. .

Technical parameters

Measuring input	
Nominal frequency f_N	50 Hz or 60Hz
Nominal input current U_N	0…250 V or 0…500 V switchable
Measuring range	0…300 V or 0…600 V
Overload capacity	4 · U_N, permanent
Internal resistance	4 M Ω
Measuring output 0(4)…20 mA	
Load-independent DC (0…300 V or 0…600 V)	0…24 mA / 750 Ω Burden or live-zero 4…23,2 mA / 750 Ω Burden
Load-independent DC at U_N max.	20 mA / 750 Ω Burden
Open-circuit voltage	max. 22 V
Current limitation	max. 25 mA on overload
Measuring output 0(2)…10 V	
Imprinted DC voltage (0…300 V or 0…600 V)	0…12 V / ≥ 10 kΩ Burden or live-zero 2…11,6 V / ≥ 10 kΩ Burden
Imprinted DC voltage at U_N max	10 V / ≥ 10 kΩ Burden
Voltage limitation	12,5 V on overload
Residual ripple	< 10 mVpp
Setting time	< 200 ms
Frequency influence	< 0,05 % at 10 Hz Frequency change
External field influence	no (400 A/m)
Digital interface	
Protocol	Modbus RTU
Electrical	RS 485
Line length	Max. 30m, shielded from 3m (non-interbuilding)
Accuracy	
Basic accuracy	± 0,5 % at 0 – 120 % of the final value U_N

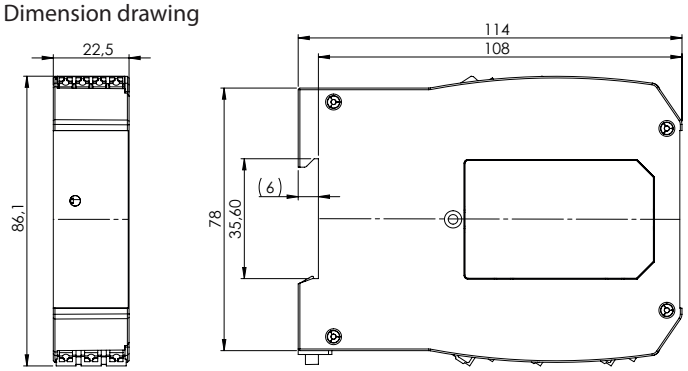
Temperature range	-20°C to +70°C
Temperature influence	< 0,05 % at 10 K
Humidity	10-70 % rel. humidity, non condensing
Auxiliary energy	
AC voltage	100…277 V AC, 47-63 Hz condensing
DC voltage	24 V DC, ± 15%
Auxiliary voltage influence	no
Internal consumption	< 1,4 W @ 24 V DC < 2 VA @ 230 V AC
Waveform	Non-sinusoidal, Crestfactor < 4
Safety	
Test voltage	4 kV between input, output, auxiliary voltage 230 V AC or 1 kV for auxiliary voltage 24 V DC
Weight	ca. 115 g
General technical data	
Protection class	2
Protection type	IP 20
Measuring category	CAT III
Degree of polution	2
Switchable via dip switch	
1: DIP acive / inactive	OFF = Setting acc. to Modbus
	ON = Setting acc. to. DIP 2, 3, 4
2: Measuring range	OFF = 250 V
	ON = 500 V
3: Measuring output voltage	OFF = 0…10 V
	ON = 2…10 V
4: Measuring output current	OFF = 0…20 mA
	ON = 4…20 mA

Dip switch backside

Dip switch

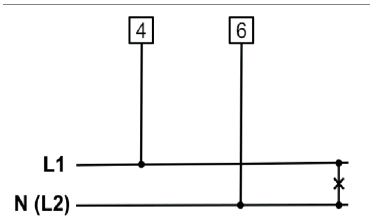
MTU Dimension drawing

Dimension drawing

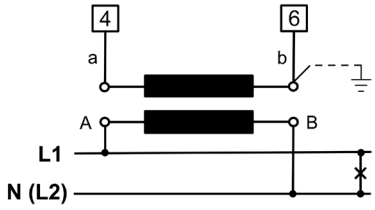


MTU Connecting diagram

Direct switching



Transducer circuit



MTU Terminal assignment

Terminal	
4	U_E
6	U_E
7	UH L1 (+)
9	UH N (-)
18	U_A (+)
19	U_A (-)
20	I_A (+)
21	I_A (-)
Modbus RTU	
14	D+
15	D-
16	GND

Order table

		Measurement output / adjusted				Setting via 4-pole DIP switch
Auxiliary voltage U_H	Nominal input voltage (V)	0...10 V and 0...20 mA	0...10 V and 4...20 mA	2...10 V and 0...20 mA	2...10 V and 4...20 mA	
230 V	250 V	225301	225302	225303	225304	225300
	500 V	225305	225306	225307	225308	
24 V	250 V	225401	225402	225403	225404	225400
	500 V	225405	225406	225407	225408	

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MBS IDNR 8.4.0477/1000/04-2022