

**kWh Energy meter**  
**1-phase with multi-functional LCD display**  
**Type 7E.23 5(32)A - 1 module wide**

- Complies with EN 62053-21 and EN 50470
- Display indicates total energy consumption, partial energy consumption (this value is resettable), instantaneous: power, voltage and current
- Seven digit counter, LCD with backlight
- Accuracy class: 1/B
- Easy to operate by one control key
- Protection class II
- Pulse output for remote energy management; SO interface (open collector) according to DIN 43864 to link the energy meter to a centrally located monitoring/management system
- Tamper-proof cover with lead seal facility available as an accessory
- Space saving small size
- 35 mm rail (EN 60715) mount
- MID compliant version (50 Hz only) available

\* 0.01 kWh for readings  $\leq 99\,999.99$  kWh and  
0.1 kWh for readings  $\geq 100\,000.0$  kWh

For outline drawing see page 17

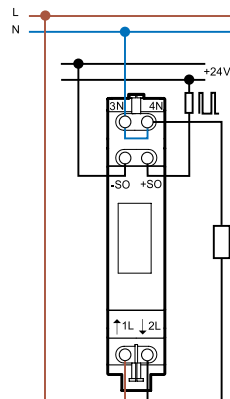
**Specification**

Nominal/Maximum current	A	5/32	5/32
Minimum measured current	A	0.02	0.02
Current range (within accuracy class)	A	0.25...32	0.25...32
Maximum peak current	A	960 (10 ms)	960 (10 ms)
Supply (& monitored) voltage ( $U_N$ )	V AC	230	230
Operating range		$(0.8...1.15)U_N$	$(0.8...1.15)U_N$
Frequency	Hz	50	50
Power consumption	W	< 0.4	< 0.4
Display (digit height 5 mm)		Seven digit counter, LCD without backlight	Seven digit counter, LCD with backlight
Max. totalising count/Min. increment	kWh	999 999.9/0.01*	999 999.9/0.01*
LCD-segment pulses per kWh		2000	2000
<b>Open collector- output specification (SO+/SO-)</b>			
Voltage (external supply)	V DC	5...30	5...30
Maximum current	mA	20	20
Maximum leakage current @ 30 V/25 °C	$\mu$ A	10	10
Pulses per kWh		1000	1000
Pulse length	ms	30	30
Internal series resistance	$\Omega$	100	100
Maximum cable length @ 30 V/20 mA	m	1000	1000
<b>Technical data</b>			
Accuracy class		1/B	1/B
Ambient temperature (Within accuracy class)	°C	-10...+55	-25...+55
Protective class		II	II
Protection category: Housing/terminals		IP 50/IP 20	IP 50/IP 20
<b>Approvals</b> (according to type)			

**NEW** 7E.23.8.230.0001



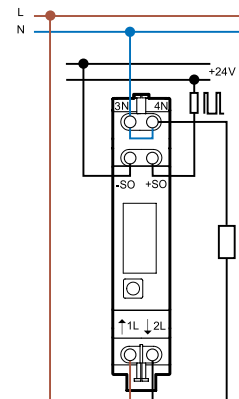
- Nominal current 5 A (32 A Maximum)
- 1-phase 230 V AC
- kWh only
- 17.5 mm wide



7E.23.8.230.00x0



- Nominal current 5 A (32 A Maximum)
- 1-phase 230 V AC
- kWh + instantaneous W, V & A
- 17.5 mm wide



**kWh Energy meter**

**3-phase with multi-functional LCD display**

**Type 7E.46-0002 10(65)A - Single and Dual tariff**

**Type 7E.56-0000 5 (6)A - for current transformers up to 1500 A**

- Complies with EN 62053-21 and EN 50470
- Display indicates total energy consumption, partial energy consumption (this value is resettable), instantaneous power per phase or all phases, voltage per phase, current per phase
- ERROR-Display, in case of missing phase or reverse current flow
- Seven digit counter, LCD with backlight
- Accuracy class: 1/B
- Easy to operate by two control keys
- LCD display can be read twice within a period of 10 days following the loss of supply voltage
- Protection class II
- Pulse output for remote energy management; SO interface (open collector) according to DIN 43864 to link the energy meter to a centrally located monitoring/management system
- Tamper-proof cover with lead seal facility available as an accessory
- 35 mm rail (EN 60715) mount
- MID compliant version (50 Hz only) available

\* Current transformer ratios: 5:5, 50:5, 100:5, 150:5, 200:5, 250:5, 300:5, 400:5, 500:5, 600:5, 750:5, 1000:5, 1250:5, 1500:5.

\*\* 0.01 kWh for readings ≤ 99 999.99 kWh and 0.1 kWh for readings ≥ 100 000.0 kWh

\*\*\* 0.1 kWh for readings ≤ 999 999.9 kWh and 1 kWh for readings ≥ 1 000 000 kWh

For outline drawing see page 17

**Specification**

Nominal/Maximum current	A	10/65	5/6
Minimum measured current	A	0.04	0.01
Current range (within accuracy class)	A	0.5...65	0.05...6
Maximum peak current	A	1950 (10 ms)	180 (10 ms)
Supply (& monitored) voltage (U <sub>N</sub> )	V AC	3 x 230	3 x 230
Operating range		(0.8...1.15)U <sub>N</sub>	(0.8...1.15)U <sub>N</sub>
Frequency	Hz	50	50
Power consumption per phase	W	< 1.5	< 1.5

Display (digit height 6 mm)	Seven digit counter, LCD with backlight		
Max. totalising count/Min. increment	kWh	999 999.9/0.01**	9 999 999/0.1***
LCD-segment pulses per kWh		100	10

**Open collector- output specification (SO+/SO-)**

Voltage (external supply)	V DC	5...30	5...30
Maximum current	mA	20	20
Maximum leakage current @ 30 V/25 °C	µA	10	10
Pulses per kWh		1000	10
Pulse length	ms	30	30
Internal series resistance	Ω	100	100
Maximum cable length @ 30 V/20 mA	m	1000	1000

**Technical data**

Accuracy class		1/B	1/B
Ambient temperature	°C	-25...+55	-25...+55
Protective class		II	II
Protection category: Housing/terminals		IP 50/IP 20	IP 50/IP 20

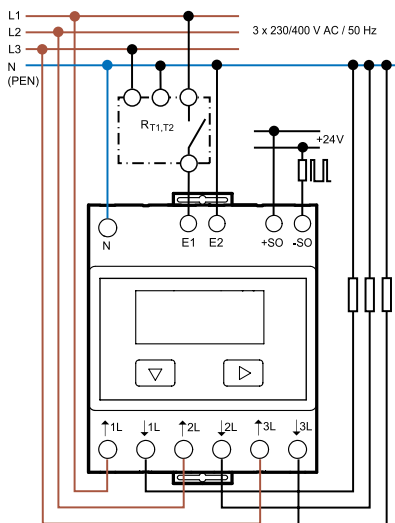
**Approvals** (according to type)



**7E.46.8.400.00x2**



- Nominal current 10 A (65 A Maximum)
- 3-phase
- Single and Dual tariff (Day and Night)
- 70 mm wide

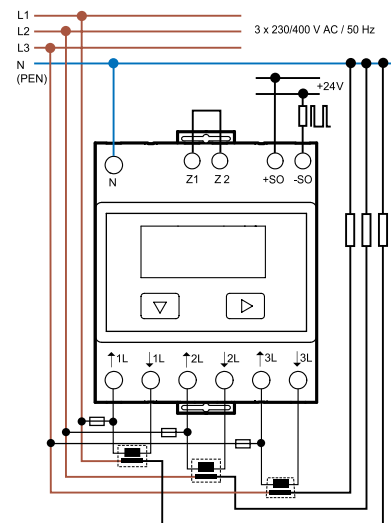


R<sub>T1,T2</sub> = Tariff switching equipment

**7E.56.8.400.00x0**



- Nominal current 5 A (6 A Maximum)
- 3-phase
- Usable with current transformer up to 1500 A
- 14 selectable Current Transformer ratios\*
- 70 mm wide



\* Current transformer ratios / F = 250 mA T

**kWh Energy meter**

**1-phase with electro-mechanical display**

**Type 7E.12 10(25)A - 2 module wide**

**Type 7E.13 5(32)A - 1 module wide**

**Type 7E.16 10(65)A - 2 module wide**

- Complies with EN 62053-21 and prEN 50470
- Certified by PTB (Physikalisch - Technischen Bundesanstalt)
- Accuracy class 1/B
- Protection class II
- Pulse output for remote energy management; SO interface (open collector) according to DIN 43864 to link the energy meter to a centrally located monitoring/management system
- Tamper-proof cover with lead seal facility available as an accessory
- Space saving small size
- 35 mm rail (EN 60715) mount
- MID compliant version (50 Hz only) available

**7E.12.8.230.0002**



- Nominal current 10 A (25 A Maximum)
- 1-phase 230 V AC
- 35 mm wide

**7E.13.8.230.00x0**

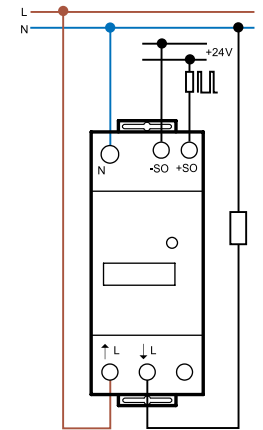
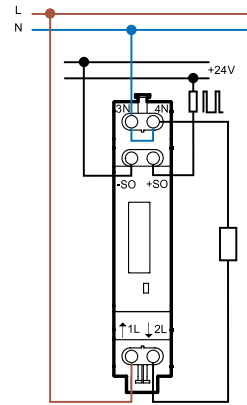
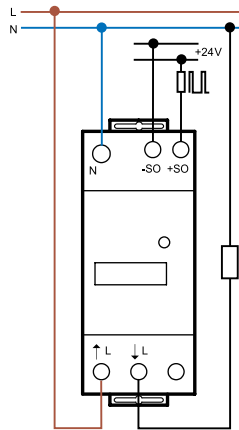


- Nominal current 5 A (32 A Maximum)
- 1-phase 230 V AC
- 17.5 mm wide

**7E.16.8.230.00x0**



- Nominal current 10 A (65 A Maximum)
- 1-phase 230 V AC
- 35 mm wide



For outline drawing see page 17

**Specification**

Nominal/Maximum current	A	10/25	5/32	10/65
Minimum measured current	A	0.04	0.02	0.04
Current range (within accuracy class)	A	0.5...25	0.25...32	0.5...65
Maximum peak current	A	750 (10 ms)	960 (10 ms)	1950 (10 ms)
Supply (& monitored) voltage (U <sub>N</sub> )	V AC	230	230	230
Operating range		(0.8...1.15)U <sub>N</sub>	(0.8...1.15)U <sub>N</sub>	(0.8...1.15)U <sub>N</sub>
Frequency	Hz	50	50	50
Power consumption	W	< 0.5	< 0.4	< 0.5
Display (digit height 4 mm)		Six digit counter, red decimal digit		Seven digit counter, red decimal digit
Max. totalising count/Min. increment	kWh	99 999.9/0.1	999 999.9/0.1	999 999.9/0.1
LED-Pulses per kWh		2000	2000	1000
<b>Open collector- output specification (SO+/SO-)</b>				
Voltage (external supply)	V DC	5...30	5...30	5...30
Maximum current	mA	20	20	20
Maximum leakage current @ 30 V/25 °C	µA	10	10	10
Pulses per kWh		1000	1000	1000
Pulse length	ms	50	50	50
Internal series resistance	Ω	100	100	100
Maximum cable length @ 30 V/20 mA	m	1000	1000	1000
<b>Technical data</b>				
Accuracy class		1/B	1/B	1/B
Ambient temperature (Within accuracy class)	°C	-10...+55	-10...+55	-10...+55
Protective class		II	II	II
Protection category: Housing/terminals		IP 50/IP 20	IP 50/IP 20	IP 50/IP 20
<b>Approvals</b> (according to type)		<b>CE</b>	<b>CE</b>	<b>PTB</b>

**kWh Energy meter**

**3-phase with electro-mechanical display**

**Type 7E.36-0000 10(65)A - Single tariff**

**Type 7E.36-0002 10(65)A - Dual tariff**

- Complies with EN 62053-21 and prEN 50470
- Certified by PTB (Physikalisch - Technischen Bundesanstalt)
- Accuracy class 1/B
- Protection class II
- Pulse output for remote energy management; SO interface (open collector) according to DIN 43864 to link the energy meter to a centrally located monitoring/management system
- Tamper-proof cover with lead seal facility available as an accessory
- 35 mm rail (EN 60715) mount
- MID compliant version (50 Hz only) available

**7E.36.8.400.00x0**

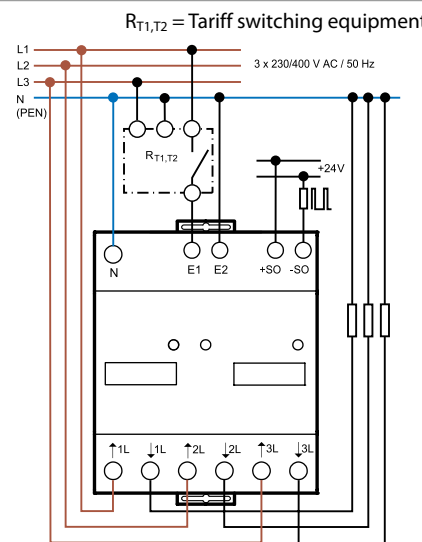
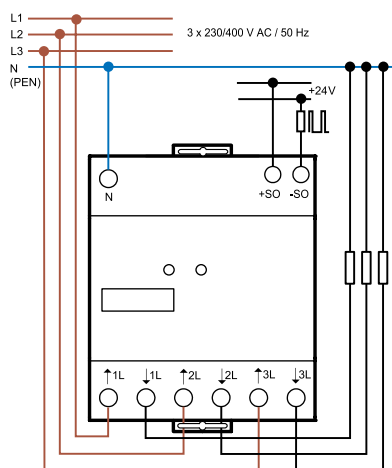


- Nominal current 10 A (65 A Maximum)
- 3-phase
- 70 mm wide

**7E.36.8.400.00x2**



- Nominal current 10 A (65 A Maximum)
- 3-phase
- Dual tariff (Day and Night)
- 70 mm wide



For outline drawing see page 17

**Specification**

Nominal/Maximum current	A	10/65	10/65
Minimum measured current	A	0.04	0.04
Current range (within accuracy class)	A	0.5...65	0.5...65
Maximum peak current	A	1950 (10 ms)	1950 (10 ms)
Supply (& monitored) voltage (U <sub>N</sub> )	V AC	3 x 230	3 x 230
Operating range		(0.8...1.15)U <sub>N</sub>	(0.8...1.15)U <sub>N</sub>
Frequency	Hz	50	50
Power consumption per phase	W	< 1.5	< 1.5

Display (digit height 4 mm)	Seven digit counter, red decimal digit		
Max. totalising count/Min. increment	kWh	999 999.9/0.1	999 999.9/0.1
LED-Pulses per kWh		100	100

**Open collector- output specification (SO+/SO-)**

Voltage (external supply)	V DC	5...30	5...30
Maximum current	mA	20	20
Maximum leakage current @ 30 V/25 °C	µA	10	10
Pulses per kWh		100	100
Pulse length	ms	50	50
Internal series resistance	Ω	100	100
Maximum cable length @ 30 V/20 mA	m	1000	1000

**Technical data**

Accuracy class		1/B	1/B
Ambient temperature	°C	-10...+55	-10...+55
Protective class		II	II
Protection category: Housing/terminals		IP 50/IP 20	IP 50/IP 20

**Approvals** (according to type)



**Multifunction energy meter MID certified with M-Bus integrated interface and backlit display for single-phase AC systems**

- Complies with EN 62053-21 and EN 50470-3
- Display indicates total energy consumption, partial energy consumption (this value is resettable); active power, instantaneous voltage and current and reactive power via M-bus interface
- Seven digit counter, LCD with backlight
- Consumption data stored on internal EEPROM
- Data transfer speed detected automatically
- Parallel connection of up to 250 energy meters
- Accuracy: Class 1 according to IEC 62053-21  
Class B according to EN 50470-3
- Reading data via a dedicated control button
- Protection class II
- Accessories: Tamper-proof cover with lead seal facility
- Space saving small size
- 35 mm rail (EN 60715) mount

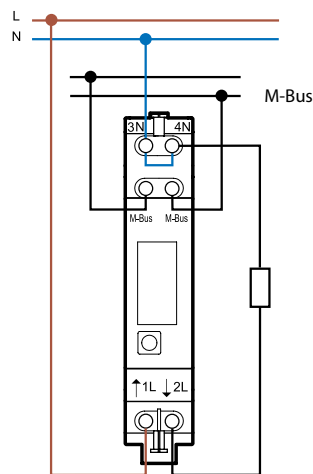
\* 0.01 kWh for readings  $\leq 99\,999.99$  kWh and  
0.1 kWh for readings  $\geq 100\,000.0$  kWh

\*\* The baud rate is recognized automatically

**NEW 7E.23.8.230.0030**



- Nominal current 5 A (32 A Maximum)
- M-Bus integrated interface
- 1-phase 230 V 50 Hz
- 17.5 mm wide



For outline drawing see page 17

**Specification**

Nominal/Maximum current	A	5/32
Minimum measured current	A	0.02
Current range (within accuracy class)	A	0.25...32
Maximum peak current	A	960 (10 ms)
Supply (& monitored) voltage ( $U_N$ )	V AC	230
Operating range		$(0.8...1.15)U_N$
Frequency	Hz	50
Power consumption per phase	W	< 0.4
Display (digit height 5 mm)		Seven digit counter, LCD with backlight
Max. totalising count/Min. increment	kWh	999 999.9/0,01*
LED-Pulses per kWh		2000
<b>M-bus technical data</b>		
Bus System		M-Bus
Bus Protocol		Conforms to M-bus standard
Max. M-Bus energy meters connectable		250
Baud rate**	Baud	300 - 2400 - 9600
Max reaction time (writing)	ms	60
Max reaction write (reading)	ms	60
<b>Technical data</b>		
Accuracy class		1/B
Ambient temperature	°C	-25...+55
Protective class		II
Protection category: Housing/terminals		IP 50/IP 20
<b>Approvals</b> (according to type)		<b>CE</b>

**Multifunction energy meter MID certified with M-Bus integrated interface and backlit display for three-phase AC systems**

**Type 7E.46-0032 10(65)A - Dual tariff**

**Type 7E.56-0030 5 (6)A - for current transformers up to 1500 A**

- Complies with EN 62053-21 and EN 50470-3
- Display indicates total energy consumption, partial energy consumption (this value is resettable); active power, instantaneous voltage and current and reactive power via M-bus interface (total or for each phase)
- ERROR-Display, in case of missing phase or reverse current flow
- Seven digit counter, LCD with backlight
- Consumption data stored on internal EEPROM
- Data transfer speed detected automatically
- Parallel connection of up to 250 energy meters
- Accuracy: Class 1 according to IEC 62053-21 Class B according to EN 50470-3
- Reading data via a dedicated control button
- Protection class II
- Accessories: Tamper-proof cover with lead seal facility
- 35 mm rail (EN 60715) mount

- \* Current transformer ratios: 5:5, 50:5, 100:5, 150:5, 200:5, 250:5, 300:5, 400:5, 500:5, 600:5, 750:5, 1000:5, 1250:5, 1500:5; preset at the factory: 5:5
- \*\* 0.01 kWh for readings  $\leq 99\,999.99$  kWh and 0.1 kWh for readings  $\geq 100\,000.0$  kWh
- \*\*\* 0.1 kWh for readings  $\leq 999\,999.9$  kWh and 1 kWh for readings  $\geq 1\,000\,000$  kWh
- \*\*\*\* The baud rate is recognized automatically

For outline drawing see page 17

**Specification**

Nominal/Maximum current	A	10/65
Minimum measured current	A	0.04
Current range (within accuracy class)	A	0.5...65
Maximum peak current	A	1950 (10 ms)
Supply (& monitored) voltage (U <sub>N</sub> )	V AC	3 x 230
Operating range		(0.8...1.15)U <sub>N</sub>
Frequency	Hz	50
Power consumption per phase	W	< 1.5
Display (digit height 5 mm)		Seven digit counter, LCD with backlight
Max. totalising count/Min. increment	kWh	999 999.9/0,01**
LED-Pulses per kWh		1000

**Bus System**

Bus System		M-Bus
Bus Protocol		Conforms to M-bus standard
Max. M-Bus energy meters connectable		250
Baud rate****	Baud	300 - 2400 - 9600
Max reaction time (writing)	ms	60
Max reaction write (reading)	ms	60

**Technical data**

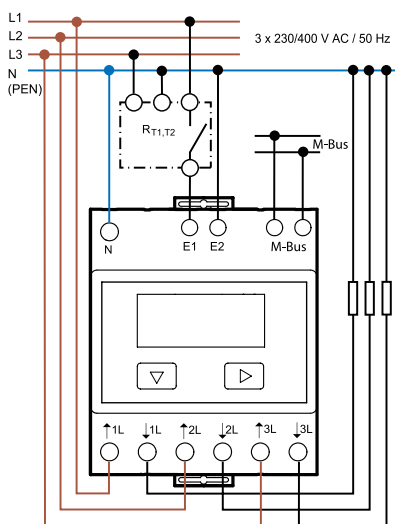
Accuracy class		1/B
Ambient temperature	°C	-25...+55
Protective class		II
Protection category: Housing/terminals		IP 50/IP 20

**Approvals** (according to type)

**NEW 7E.46.8.400.0032**



- Nominal current 10 A (65 A Maximum)
- M-Bus integrated interface
- 3-phase
- Dual tariff (Day and Night)
- 70 mm wide

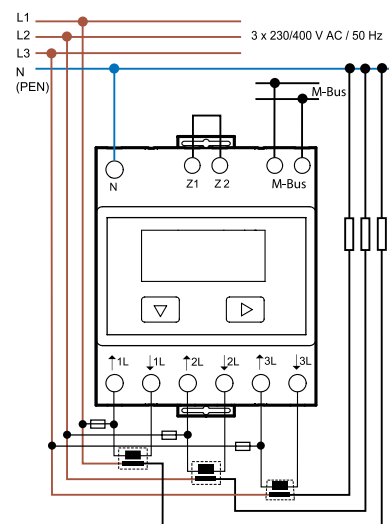


R<sub>T1,T2</sub> = Tariff switching equipment

**NEW 7E.56.8.400.0030**



- Nominal current 5 A (6 A Maximum)
- M-Bus integrated interface
- 3-phase
- Usable with current transformer up to 1500 A
- 14 selectable Current Transformer ratios\*
- 70 mm wide



\* Current transformer ratios / F = 250 mA/T



**Multifunction energy meter MID certified with Modbus RS-485 integrated interface and backlit display for single phase AC systems**

- Complies with EN 62053-21 and EN 50470-3
- Display indicates total energy consumption, partial energy consumption (this value is resettable); active power, instantaneous voltage and current. Via Modbus interface reactive power and  $\cos\phi$  measurement
- Seven digit counter, LCD with backlight
- Consumption data stored on internal EEPROM
- Data transfer speed detected automatically
- Parallel connection of up to 247 energy meters
- Accuracy: Class 1 according to IEC 62053-21  
Class B according to EN 50470-3
- Reading data via a dedicated control button
- Protection class II
- Accessories: Tamper-proof cover with lead seal facility
- Space saving small size
- 35 mm rail (EN 60715) mount

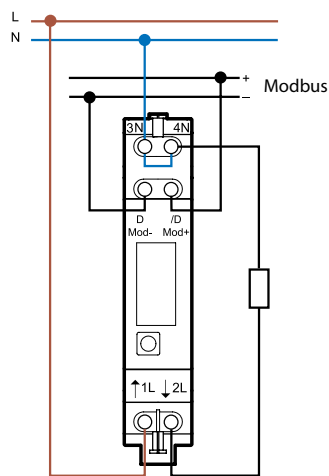
\* 0.01 kWh for readings  $\leq 99\,999.99$  kWh and 0.1 kWh for readings  $\geq 100\,000.0$  kWh

\*\* The baud rate is recognized automatically

**NEW 7E.23.8.230.0210**



- Nominal current 5 A (32 A Maximum)
- Modbus RS-485 integrated interface
- 1-phase 230 V 50 Hz
- 17.5 mm wide



For outline drawing see page 17

**Specification**

Nominal/Maximum current	A	5/32
Minimum measured current	A	0.02
Current range (within accuracy class)	A	0.25...32
Maximum peak current	A	960 (10 ms)
Supply (& monitored) voltage ( $U_N$ )	V AC	230
Operating range		$(0.8...1.15)U_N$
Frequency	Hz	50
Power consumption per phase	W	< 0.4
Display (digit height 5 mm)		Seven digit counter, LCD with backlight
Max. totalising count/Min. increment	kWh	999 999.9/0.01*
LED-Pulses per kWh		2000
<b>Modbus technical data</b>		
Bus System		RS-485 serial interface
Max. bus length	m	1200
Max. Modbus energy meters connectable		247
Baud rate**	Baud	2400 - 4800 - 9600 - 19200 38400 - 57600 - 115200
Max reaction time (writing/reading)	ms	60/60
<b>Technical data</b>		
Accuracy class		1/B
Ambient temperature	°C	-25...+55
Protective class		II
Protection category: Housing/terminals		IP 50/IP 20
<b>Approvals</b> (according to type)		<b>CE</b>

**Multifunction energy meter MID certified with Modbus RS-485 integrated interface and backlit display for three-phase AC systems**

**Type 7E.46-0212 10(65)A - Dual tariff**

**Type 7E.56-0210 5 (6)A - for current transformers up to 1500 A**

- Complies with EN 62053-21 and EN 50470-3
- Display indicates total energy consumption, partial energy consumption (this value is resettable); active power, instantaneous voltage and current.  
Via Modbus interface reactive power measurement (total or for each phase)
- Seven digit counter, LCD with backlight
- Consumption data stored on internal EEprom
- Data transfer speed detected automatically
- Parallel connection of up to 247 energy meters
- Accuracy: Class 1 according to IEC 62053-2 Class B according to EN 50470-3
- Reading data via a dedicated control buttons
- Protection class II
- Accessories: Tamper-proof cover with lead seal facility
- 35 mm rail (EN 60715) mount

\* Current transformer ratios: 5:5, 50:5, 100:5, 150:5, 200:5, 250:5, 300:5, 400:5, 500:5, 600:5, 750:5, 1000:5, 1250:5, 1500:5; preset at the factory: 5:5

\*\* 0.01 kWh for readings ≤ 99 999.99 kWh and 0.1 kWh for readings ≥ 100 000.0 kWh

\*\*\* 0.1 kWh for readings ≤ 999 999.9 kWh and 1 kWh for readings ≥ 1 000 000 kWh

\*\*\*\* The baud rate is recognized automatically

For outline drawing see page 17

**Specification**

Nominal/Maximum current	A	10/65
Minimum measured current	A	0.04
Current range (within accuracy class)	A	0.5...65
Maximum peak current	A	1950 (10 ms)
Supply (& monitored) voltage (U <sub>N</sub> )	V AC	3 x 230
Operating range		(0.8...1.15)U <sub>N</sub>
Frequency	Hz	50
Power consumption per phase	W	< 1.5

Display (digit height 5 mm)	Seven digit counter, LCD with backlight	
Max. totalising count/Min. increment	kWh	999 999.9/0.01**
LED-Pulses per kWh		1000

**Modbus technical data**

Bus System	RS-485 serial interface	
Max. bus length	m	1200
Max. Modbus energy meters connectable		247
Baud rate****	Baud	1200 - 2400 - 4800 - 9600 - 19200 38400 - 57600 - 115200
Max reaction time (writing/reading)	ms	60/60

**Technical data**

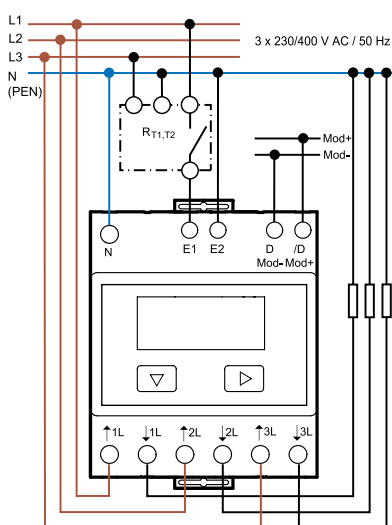
Accuracy class		1/B
Ambient temperature	°C	-25...+55
Protective class		II
Protection category: Housing/terminals		IP 50/IP 20

**Approvals** (according to type)

**NEW 7E.46.8.400.0212**



- Nominal current 10 A (65 A Maximum)
- Modbus RS-485 integrated interface
- 3-phase
- Dual tariff (Day and Night)
- 70 mm wide

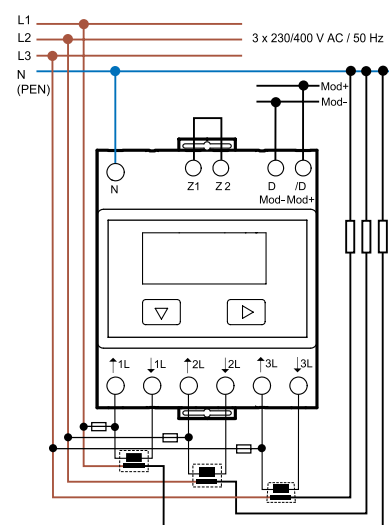


R<sub>T1,T2</sub> = Tariff switching equipment

**NEW 7E.56.8.400.0210**



- Nominal current 5 A (6 A Maximum)
- Modbus RS-485 integrated interface
- 3-phase
- Usable with current transformer up to 1500 A
- 14 selectable Current Transformer ratios\*
- 70 mm wide



\* Current transformer ratios / F = 250 mA T





## Ordering information

Example: Energy meter 32 A/230 V AC, with PTB certified, accuracy class 1, available with Tamper-proof lead sealed cover as accessory, for 35 mm rail (EN 60715) mounting.

**7 E . 1 3 . 8 . 2 3 0 . 0 0 0 0**

**Series**

**Function**

- 1 = 1-phase
- 2 = 1-phase with LCD display
- 3 = 3-phase
- 4 = 3-phase with LCD display
- 5 = 3-phase with LCD display for current transformer operation

**Current**

- 2 = 25 A
- 3 = 32 A
- 6 = 65 A (up to 1500 A, type 7E.56)

**Supply version**

- 8 = AC 50 Hz

**Special version**

- 0 = Standard
- 1 = MID compliant versions

**Option**

- 0 = Standard
- 1 = kWh only (7E.23)
- 2 = Standard (7E.12)
- 2 = Dual tariff (7E.36, 7E.46)

**Supply voltage**

- 230 = 230 V AC 50 Hz
- 400 = 3 x 230/400 V AC 50 Hz

**All versions/width**

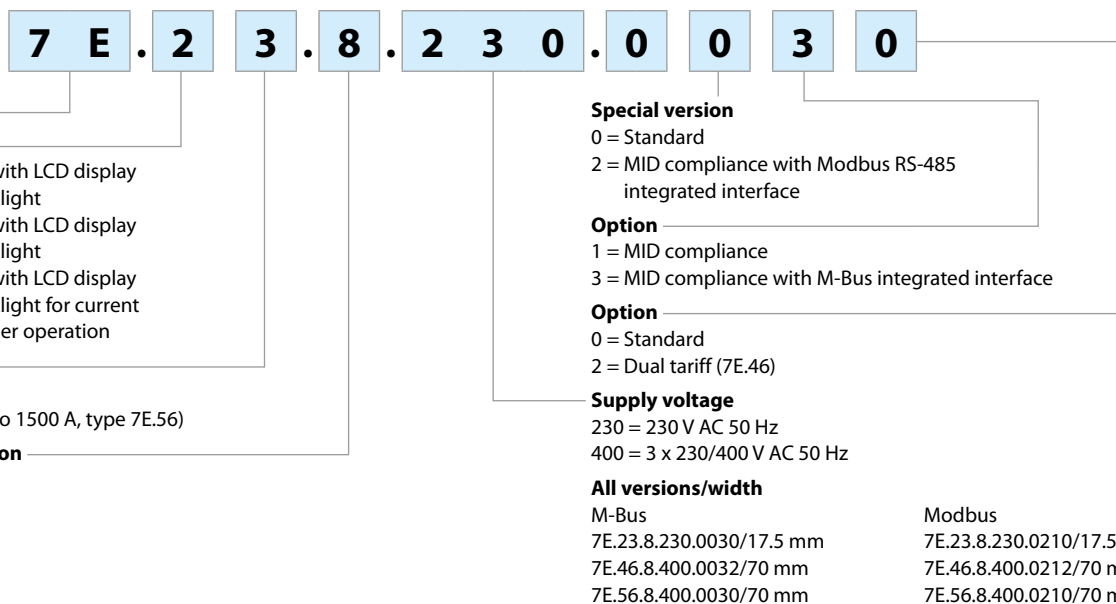
- 7E.12.8.230.0002/35 mm
- 7E.13.8.230.0000/17.5 mm
- 7E.13.8.230.0010/17.5 mm
- 7E.16.8.230.0000/35 mm
- 7E.16.8.230.0010/35 mm
- 7E.23.8.230.0000/17.5 mm
- 7E.23.8.230.0001/17.5 mm
- 7E.23.8.230.0010/17.5 mm
- 7E.36.8.400.0000/70 mm
- 7E.36.8.400.0010/70 mm
- 7E.36.8.400.0002/70 mm
- 7E.36.8.400.0012/70 mm
- 7E.46.8.400.0002/70 mm
- 7E.46.8.400.0012/70 mm
- 7E.56.8.400.0000/70 mm
- 7E.56.8.400.0010/70 mm

## Technical data

<b>Insulation EN 62053-21</b>		<b>7E.12, 7E.13, 7E.16, 7E.23</b>		<b>7E.36, 7E.46, 7E.56</b>		
Insulation rated voltage	V	250		250		
Overvoltage category		IV		IV		
Insulation	between active parts and SO+/SO- terminals	kV (1.2/50 µs)	6		6	
	between adjacent phases	kV (1.2/50 µs)	—		6	
Insulation	between supply and SO+/SO-	V AC	4000		4000	
	between adjacent phases	V AC	—		4000	
Protection class		II		II		
<b>EMC Specification</b>		<b>Reference standard</b>				
Electrostatic discharge	contact discharge	EN 61000-4-2		8 kV		
	air discharge	EN 61000-4-2		15 kV (13 kV type 7E.23)		
Radio-Frequency Electromagnetic Field (80...1000)MHz		EN 61000-4-3		10 V/m		
Fast Transients (Burst) (5-50 ns, 5 kHz)	on Supply terminals	EN 61000-4-4		Class 4 (4 kV)		
	on SO+/SO- terminals	EN 61000-4-4		Class 4 (2 kV)		
Surge (1.2/50 µs)	on Supply terminals	EN 61000-4-5		Class 4 (4 kV)		
	on SO+/SO- terminals	EN 61000-4-5		Class 3 (1 kV)		
Radio-Frequency Common Mode (0.15...80)MHz on Supply terminals		EN 61000-4-6		10 V		
Radiated and Conducted Emission		EN 55022		Class B		
<b>Other data</b>						
Pollution degree		2				
Vibration resistance	(10...60)Hz	mm	0.075			
	(60...150)Hz	g	1			
Vibration resistance of the internal mechanical counter (10...500)Hz	g	2				
Shock resistance	g/18 ms	30				
Shock resistance of the internal mechanical counter	g/18 ms	350				
Power lost to the environment		<b>7E.12, 7E.13, 7E.23</b>	<b>7E.16</b>	<b>7E.36, 7E.46, 7E.56</b>		
	without current	W	0.4	0.4	1.5	
	with maximum current	W	1	2	6	
<b>Supply terminals</b>		<b>7E.12, 7E.13, 7E.23</b>		<b>7E.16, 7E.36, 7E.46, 7E.56</b>		
Max. wire size		solid cable	stranded cable	solid cable	stranded cable	
	mm <sup>2</sup>	1...6	0.75...4	1.5...16	1.5...16	
	AWG	18...10	18...12	16...6	16...6	
Screw torque for I <sub>max</sub>	Nm	0.8...1.2		1.5...2		
Screw		Pozi driv No.1, Flat No.1, 2				
<b>SO+/SO- terminals</b>		solid cable		stranded cable		
Max. wire size		solid cable	stranded cable	solid cable	stranded cable	
	mm <sup>2</sup>	2.5	1.5	2.5	1.5	
	AWG	14	16	14	16	
Screw torque for I <sub>max</sub>	Nm	0.5		0.8		
Screw		Pozi driv No.0, Flat No.1		Pozi driv No.0, Flat No.2		



## Ordering information M-Bus/Modbus versions

Example: Energy meter 32 A/230 V AC, with PTB certified, accuracy class 1, available with Tamper-proof lead sealed cover as accessory, for 35 mm rail (EN 60715) mounting.



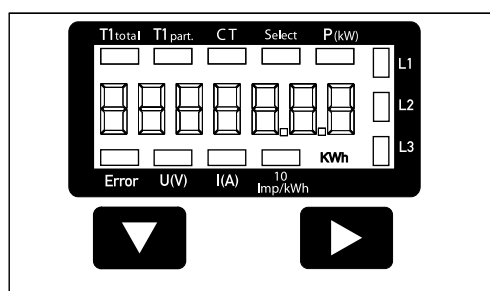
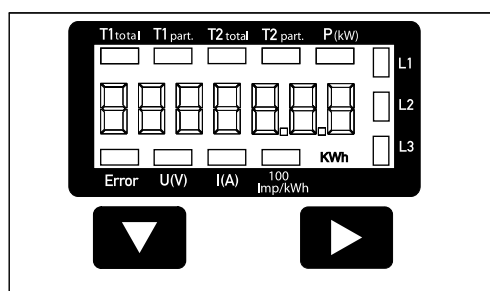
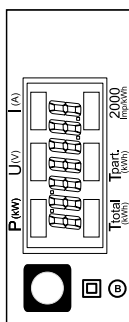
E

## Technical data M-Bus/Modbus

<b>Insulation EN 62053-21</b>		<b>7E.23</b>	<b>7E.46, 7E.56</b>		
Insulation rated voltage according to EN 62052-21	V	250	250		
Overvoltage category according to EN 62052-21		IV	IV		
Insulation according to EN 62052-21					
between supply terminals and M-Bus/Modbus terminals	kV (1.2/50 μs)	6	6		
between adjacent phases	kV (1.2/50 μs)	—	6		
Insulation					
between supply terminals and M-Bus/Modbus terminals	V AC	2000	2000		
between adjacent phases	V AC	—	4000		
Protection class		II	II		
<b>EMC Specification – EN 62052-11</b>					
Electrostatic discharge					
contact discharge		EN 61000-4-2	8 kV		
air discharge		EN 61000-4-2	15 kV (13 kV type 7E.23)		
Radio-Frequency Electromagnetic Field (80...1000)MHz		EN 61000-4-3	10 V/m		
Fast Transients (Burst) (5-50 ns, 5 kHz)					
on Supply terminals		EN 61000-4-4	Class 4 (4 kV)		
M-Bus/Modbus terminals		EN 61000-4-4	Class 3 (1 kV)		
Surge (1.2/50 μs) an					
on Supply terminals		EN 61000-4-5	Class 4 (4 kV)		
M-Bus/Modbus terminals		EN 61000-4-5	Class 3 (1 kV)		
Radio-Frequency Common Mode (0.15...80)MHz on Supply terminals		EN 61000-4-6	10 V		
EMC – Radiated and Conducted Emission		EN 55022	Class B		
<b>Other data</b>					
Pollution degree		2			
Vibration resistance according to IEC 68-2-6					
(10...60)Hz	mm	0.075			
(60...150)Hz	g	1			
Shock resistance according to IEC 68-2-27	g/18 ms	30			
Power lost to the environment					
		<b>7E.23</b>	<b>7E.46, 7E.56</b>		
without current	W	0.4	1.5		
with maximum current	W	1	6		
<b>Supply terminals</b>					
Max. wire size					
		<b>7E.23</b>	<b>7E.46, 7E.56</b>		
		solid cable	stranded cable	solid cable	stranded cable
	mm <sup>2</sup>	1...6	0.75...4	1.5...16	1.5...16
	AWG	18...10	18...12	16...6	16...6
 Screw torque for I <sub>max</sub>	Nm	0.8...1.2		1.5...2	
Screw		Pozidriv No.1, Flat No.1, 2			
<b>M-Bus/Modbus terminals</b>					
Max. wire size					
		solid cable	stranded cable	solid cable	stranded cable
	mm <sup>2</sup>	2.5	1.5	2.5	1.5
	AWG	14	16	14	16
 Screw torque for I <sub>max</sub>	Nm	0.5		0.8	
Screw		Pozidriv No.0, Flat No.1		Pozidriv No.0, Flat No.2	

## LC-Display Type 7E.23, 7E.46, 7E.56

### Indication elements



Type 7E.23		
Ttotal	kWh	Indicates total consumption
Tpart.	kWh	Indicates partial consumption, this value is resettable
P	kW	Indicates the instantaneous power
U	V	Indicates the voltage
I	A	Indicates the current
2000 Imp/kWh		Pulses according to power consumption Error indication (line L1/L2 reversed) with pulsating 600/600 ms

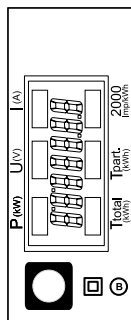
Note: for 7E.23.8.230.0001 only total energy consumption is displayed.

Type 7E.46		
T1total	kWh	Indicates total consumption Tariff 1
T1part.	kWh	Indicates partial consumption for Tariff 1, this value is resettable
T2total	kWh	Indicates total consumption Tariff 2
T2part.	kWh	Indicates partial consumption for Tariff 2, this value is resettable
P	kW	Indicates the instantaneous power per phase or all phases
U	V	Indicates the voltage per phase
I	A	Indicates the current per phase
100 Imp/kWh		Pulsed according to drawn power
kWh		Indicates the unit kWh when the consumption is displayed
L1/L2/L3		For P-, U-, I- or Error display, the corresponding phase is displayed
Error		Indicates a missing phase or reverse current flow - the appropriate phase is also displayed

Type 7E.56		
T1total	kWh	Indicates total consumption
T1part.	kWh	Indicates partial consumption, this value is resettable
CT		Indicates the set current transformer ratio, factory setting is 5:5
Select		The transformer ratio can be selected in the menu item Select*
P	kW	Indicates the instantaneous power per phase or all phases
U	V	Indicates the voltage per phase
I	A	Indicates the current per phase
10 Imp/kWh		Pulsed according to drawn power
kWh		Indicates the unit kWh when the consumption is displayed
L1/L2/L3		For P-, U-, I- or Error display, the corresponding phase is displayed
Error		Indicates a missing phase or reverse current flow - the appropriate phase is also displayed

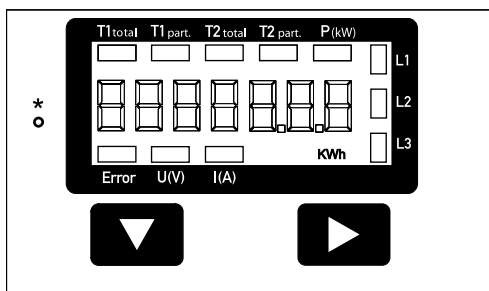
\* To adjust the current transformer ratio remove the bridge Z1 - Z2 and reset the energy meter according to the operating instructions. Then lock it again with the bridge. For a tamper proof lead seal use four terminal covers (07E.16).

LC-Display with backlight Type 7E.23, 7E.46, 7E.56 with M-Bus/modbus integrated interface



**Type 7E.23 (direct measurement up to 32 A)**

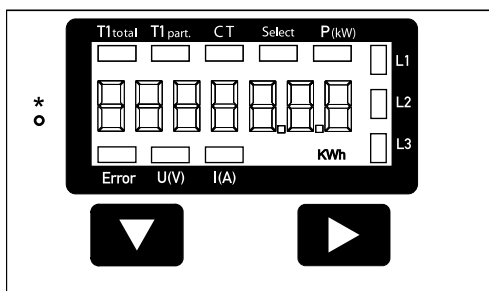
Total	kWh	Indicates total consumption
Tpart.	kWh	Indicates partial consumption. This value is resettable
P	kW	Indicates the instantaneous power
U	V	Indicates the voltage
I	A	Indicates the current
Flashing display indicator (LCD)	2000 Imp/kWh	Flashing rate varies with the instantaneous power. Indication of incorrect connection (Lines L1/L2 reversed) by 600/600 ms flashing



Display 7E.46.8.400.0032/0212

**Type 7E.46 (direct measurement up to 65 A)**

T1total	kWh	Indicates total consumption Tariff 1
T1part.	kWh	Indicates partial consumption for Tariff 1. This value is resettable
T2total	kWh	Indicates total consumption Tariff 2
T2part.	kWh	Indicates partial consumption for Tariff 2. This value is resettable
P	kW	Indicates the instantaneous power per phase or all phases
U	V	Indicates the phase voltage
I	A	Indicates the line current
kWh		Indicates the unit kWh when the consumption is displayed
L1/L2/L3		For P-, U-, I- or Error display, the corresponding phase is displayed
Error		In case of Loss of Phase or reverse current flow the corresponding phase will be indicated and "Error" is displayed
Flashing LED*	1000 Imp/kWh	Flashing rate varies with the instantaneous power



Display 7E.56.8.400.0030/0210

**Type 7E.56 (with CT measurement up to 1500 A)**

T1total	kWh	Indicates total consumption
T1part.	kWh	Indicates partial consumption. This value is resettable
CT		Indicates the current transformer ratio; factory setting is 5:5
Select		When the jumper Z1-Z2 is open, the transformation ratio can be set under the menu item: Select**
P	kW	Indicates the instantaneous power per phase or all phases
U	V	Indicates the phase voltage
I	A	Indicates the line current
kWh		Indicates the unit kWh when the consumption is displayed
L1/L2/L3		For P-, U-, I- or Error display, the corresponding phase is displayed
Error		In case of Loss of Phase or reverse current flow the corresponding phase will be indicated and "Error" is displayed
Flashing LED*	10 Imp/kWh	Flashing rate varies with the instantaneous power

\*\* To adjust the current transformer ratio remove the bridge Z1 - Z2 and reset the energy meter according to the operating instructions. Then lock it again with the bridge. For a tamper proof lead seal use four terminal covers (07E.16).

## Mechanical Display Type 7E.12, 7E.13, 7E.16, 7E.36

### LED indication (Normal operation)

Type	Energy consumption			Pulses per kWh	Pulse space	The LED Pulse rate represents the instantaneous power being consumed, according to the following
	None	Low	High			
7E.12 7E.13				2000	100 ms	$kW = (\text{number of pulse per Minute}) / 33.3$
7E.16				1000	100 ms	$kW = (\text{number of pulse per Minute}) / 16.7$
7E.36				100	150 ms	$kW = (\text{number of pulse per Minute}) / 1.7$

### LED indication (Abnormal operation)

Status indicates errors of installation, as below

#### Type 7E.12, 7E.13, 7E.16

Device ON, incorrect connection (L-N inverted).

Mark = 600 ms, Space = 600 ms

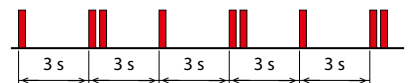


#### Type 7E.36

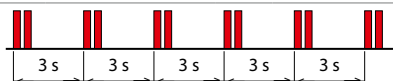
Mark = 100 ms,  
Phase L1↑ L1↓ inverted  
or loss



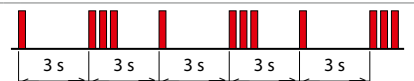
Phase L1↑ L1↓ and L2↑ L2↓  
inverted or loss



Phase L2↑ L2↓ inverted  
or loss



Phase L1↑ L1↓ and L3↑ L3↓  
inverted or loss



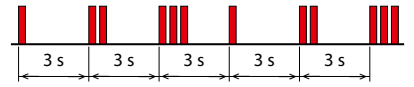
Phase L3↑ L3↓ inverted  
or loss



Phase L2↑ L2↓ and L3↑ L3↓  
inverted or loss

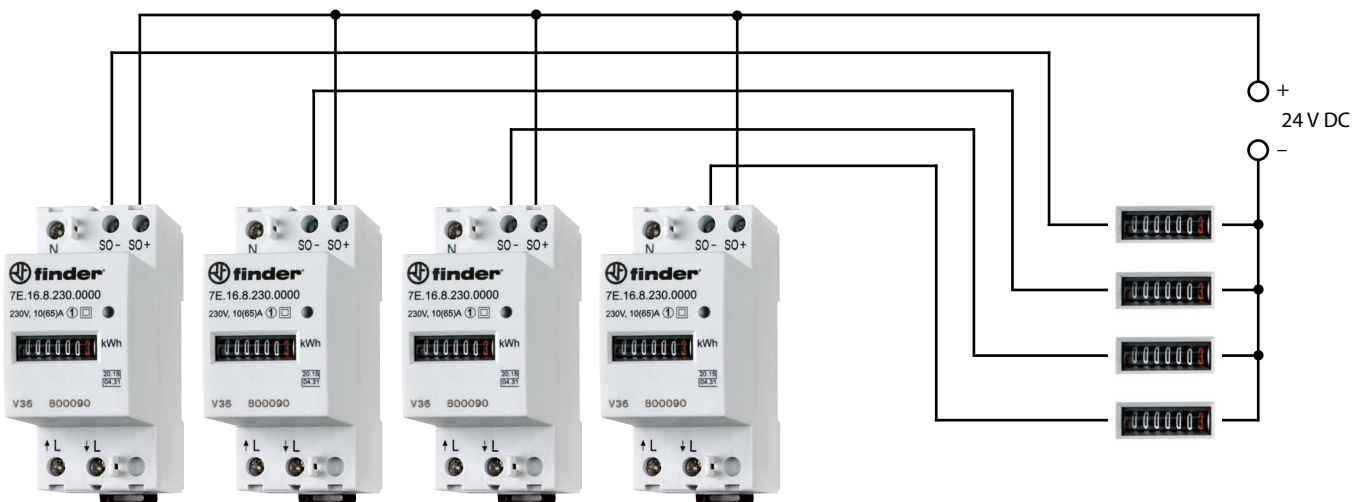


Phase L1↑ L1↓ and L2↑ L2↓  
and L3↑ L3↓ inverted or  
loss



## SO+/SO- Open collector output wiring diagram Type 7E.12, 7E.13, 7E.23, 7E.16, 7E.36, 7E.46, 7E.56

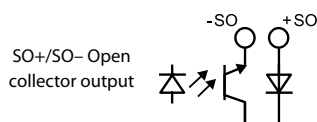
The pulsating open collector output available at terminals SO+ and SO- can be interfaced with the input of a computer, plc or other energy management equipment to allow the remote monitoring of energy consumed.



Energy meters – at difference locations  
(Note: Both Single and Dual tariff meters provide only a single pulsating output)

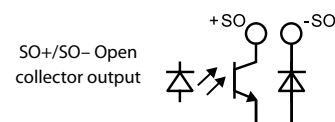
Central monitoring/management system  
(max. 20 mA for each input)

### SO-Output Type 7E.12, 7E.13, 7E.16, 7E.23



SO+/SO- Open collector output

### SO-Output Type 7E.36, 7E.46, 7E.56



SO+/SO- Open collector output

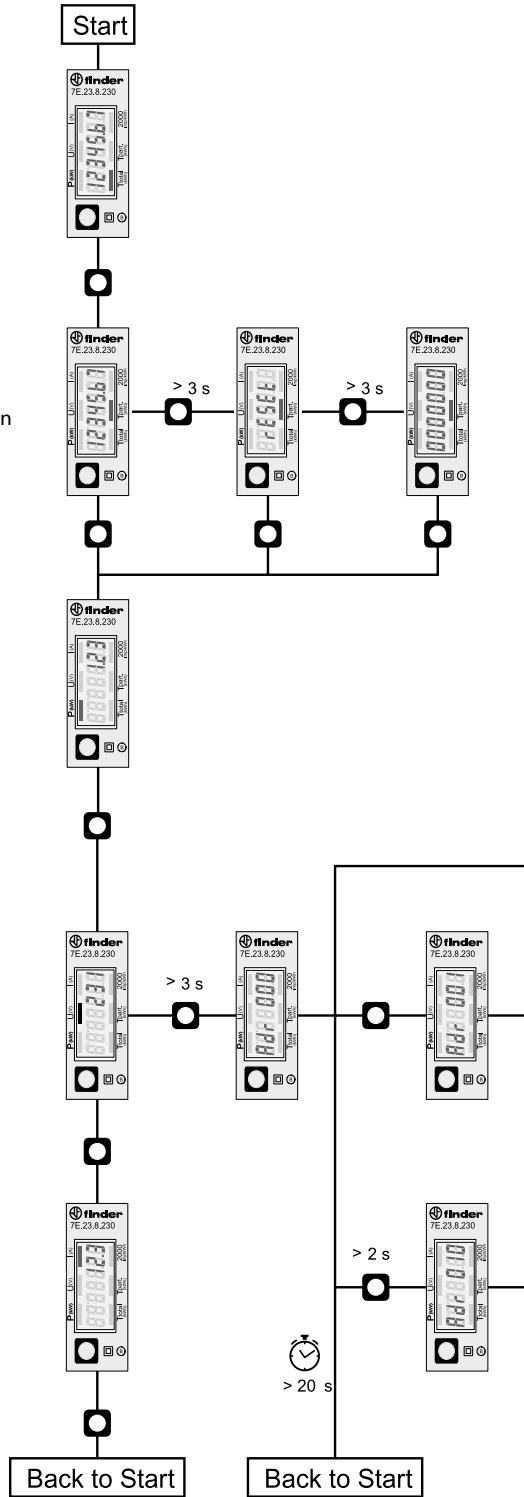
Overview of LCD display values M-Bus/Modbus - Type 7E.23

E

P  
Instantaneous power

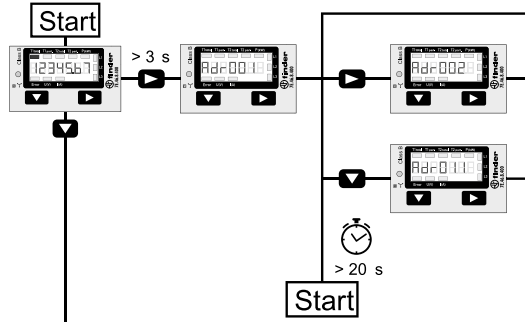
U  
Voltage

I  
Current

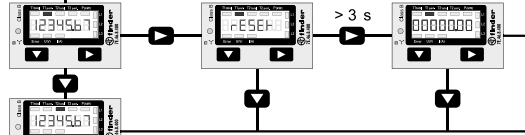


Overview of LCD display values M-Bus/Modbus - Type 7E.46

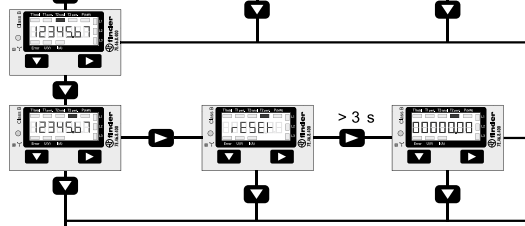
**T1 total**  
T1 total energy consumption



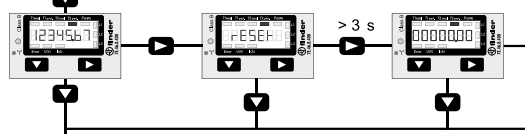
**T1 part**  
T1 partial energy consumption



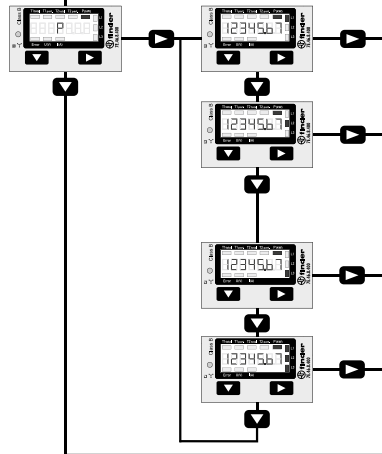
**T2 total**  
T2 total energy consumption



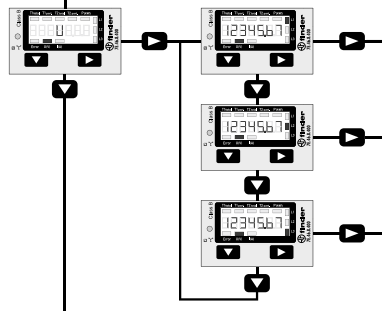
**T2 part**  
T2 partial energy consumption



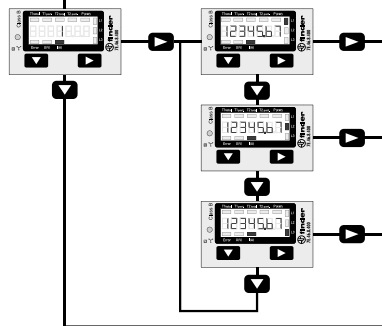
**P**  
Instantaneous power



**U**  
Voltage



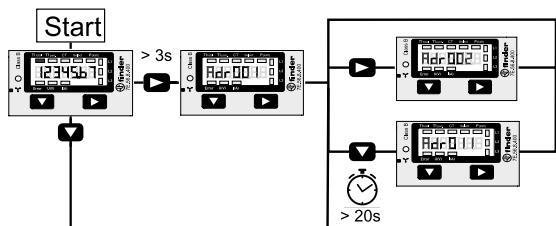
**I**  
Current



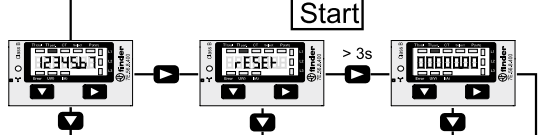
E

## Overview of LCD display values M-Bus/Modbus - Type 7E.56

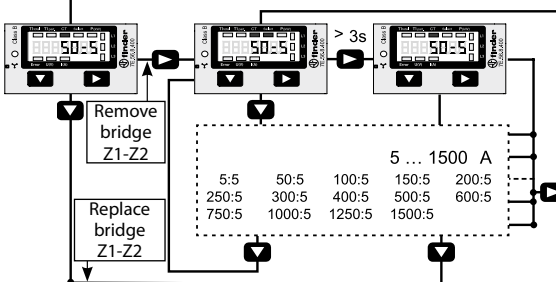
**T1 total**  
T1 total energy consumption



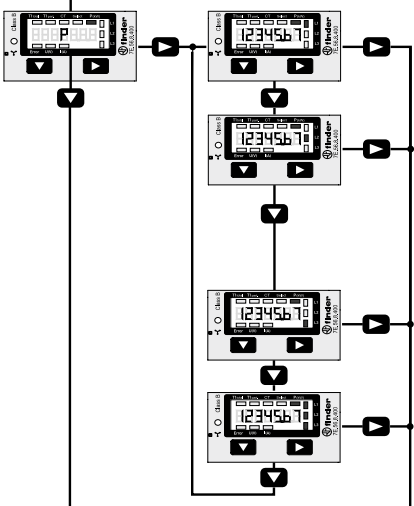
**T1 part**  
T1 partial energy consumption



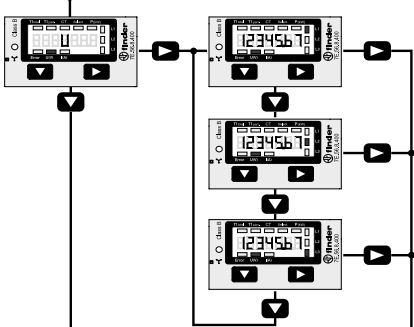
**CT**  
Current transformer ratio



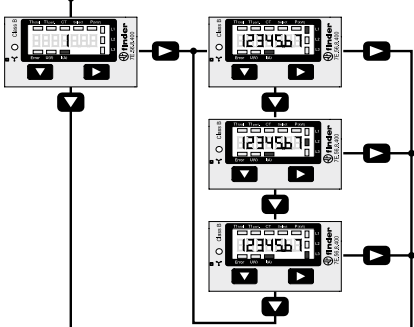
**P**  
Instantaneous power



**U**  
Voltage



**I**  
Current

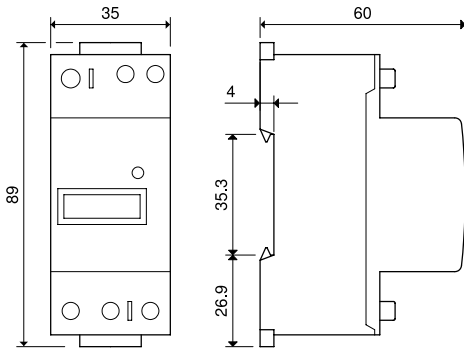


E

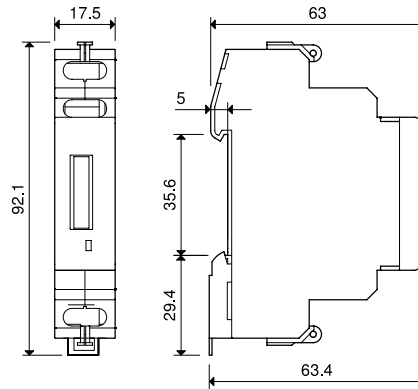


## Outline drawing

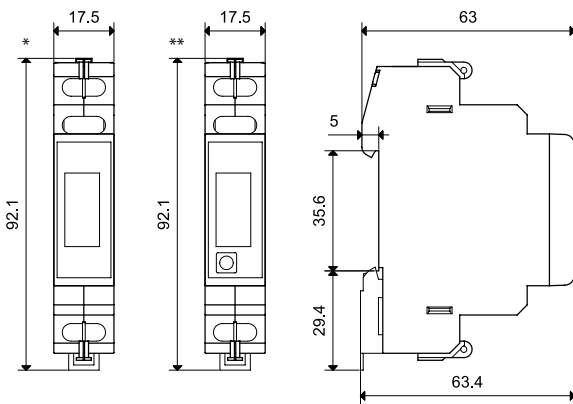
Type 7E.12.8.230.0002 / 7E.16.8.230.0000/10



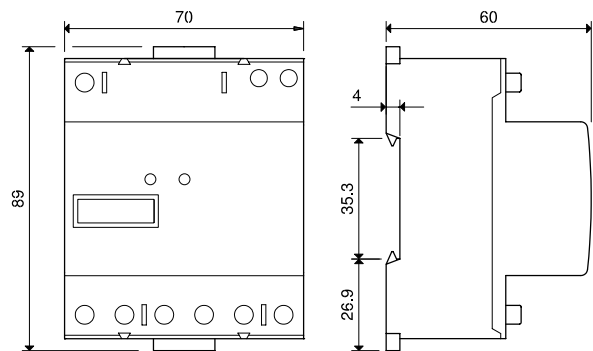
Type 7E.13.8.230.0000/10



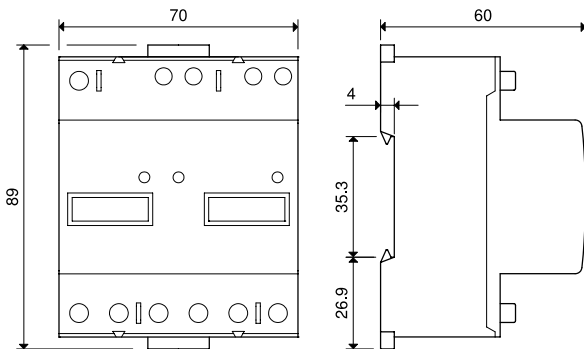
Type 7E.23.8.230.0001\* / 7E.23\*\*



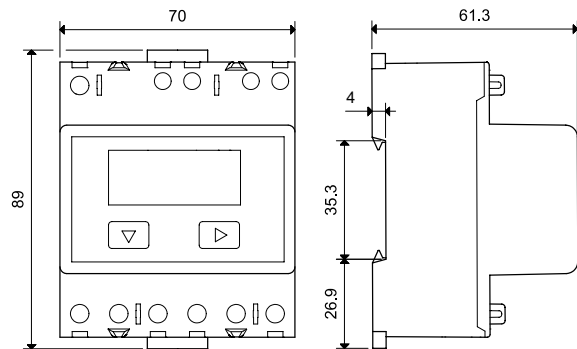
Type 7E.36.8.400.0000/10



Type 7E.36.8.400.0002/12



Type 7E.46 - 7E.56



## Accessories



07E.13

**Terminal cover** for type 7E.13, 7E.23

07E.13

For the tamper-proof lead seal use two terminal covers



07E.16

**Terminal cover** for type 7E.12, 7E.16, 7E.36, 7E.46 and 7E.56

07E.16

7E.12, 7E.16 - For the tamper-proof lead seal use two terminal covers

7E.36, 7E.46, 7E.56 - For the tamper-proof lead seal use four terminal covers

