

## Features

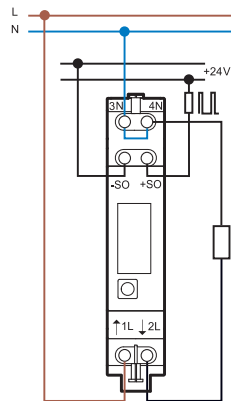
**kWh Energy meter**  
**1-phase with multi-functional LC-Display**  
**Type 7E.23 5(32)A - 1 module wide**

- Complies with EN 62053-21 and EN 50470
- Display indicates total consumption, partial 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 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

**NEW** 7E.23.8.230.00x0



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



For outline drawing see page 8

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 <sub>N</sub> )	V AC	230
Operating range		(0.8...1.15)U <sub>N</sub>
Frequency	Hz	50/60
Power consumption	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 *
LCD-segment pulses per kWh		2,000
Open collector- output specification (SO+ /SO-)		
Voltage (external supply)	V DC	5...30
Maximum current	mA	20
Maximum leakage current @30 V/25 °C	µA	10
Pulses per kWh		1,000
Pulse length	ms	30
Internal series resistance	Ω	100
Maximum Cable length @30 V/20 mA	m	1,000
Technical data		
Accuracy class		1 / B
Ambient temperature (Within accuracy class)°C		-10...+55
Protective class		II
Protection category: Housing/terminals		IP 50/IP 20
<b>Approvals</b> (according to type)		<b>CE</b>

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

## Features

kWh Energy meter  
3-phase with multi-functional LC-Display

Type 7E.46-0002 10(65)A - Single and Dual tariff  
Type 7E.56-0000 5 (6)A - for current transformer up to 1,500 A

- Complies with EN 62053-21 and EN 50470
- Display indicates total consumption, partial 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 wrong current direction
- Seven digit counter, LCD with backlight
- Accuracy class: 1/B
- Easy to operate by two control keys
- LC-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 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, 1,000:5, 1,250:5, 1,500:5.

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

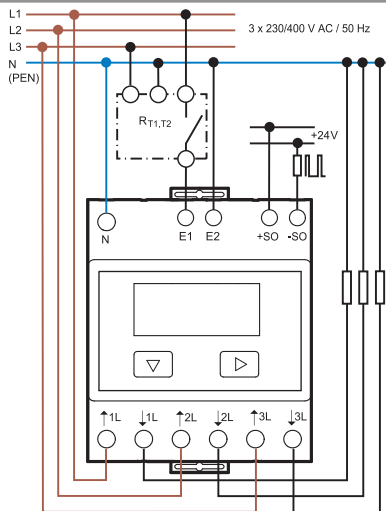
\*\*\* 0.1 kWh for readings  $\leq 999,999.9$  kWh and 1 kWh for readings  $\geq 1,000,000$  kWh

For outline drawing see page 8

**NEW** 7E.46.8.400.00x2



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

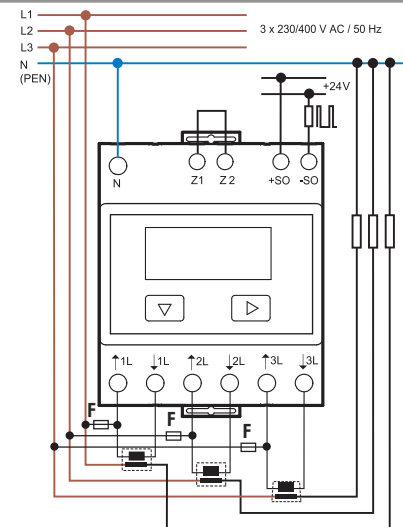


$R_{T1, T2}$  = Tariff switching equipment

**NEW** 7E.56.8.400.00x0



- Nominal current 5 A (6 A Maximum)
- 3-phase
- Usable with current transformer up to 1,500 A
- 14 selectable Current Transformer ratios
- 70 mm wide



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

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	1,950 (10 ms)	180 (10 ms)
Supply (& monitored) voltage ( $U_N$ )	V AC	3 x 230	3 x 230
Operating range		$(0.8...1.15)U_N$	$(0.8...1.15)U_N$
Frequency	Hz	50/60	50/60
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
<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		1,000	10
Pulse length	ms	30	30
Internal series resistance	$\Omega$	100	100
Maximum Cable length @30 V/20 mA	m	1,000	1,000
<b>Technical data</b>			
Accuracy class		1 / B	1 / B
Ambient temperature	$^{\circ}$ C	-10...+55 $^{\circ}$ C	-10...+55 $^{\circ}$ C
Protective class		II	II
Protection category: Housing/terminals		IP 50/IP 20	IP 50/IP 20

Approvals (according to type)



## Features

kWh Energy meter  
1-phase with 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 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

For outline drawing see page 8

### Specification

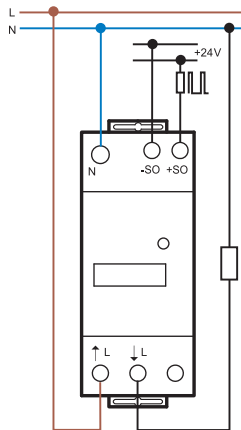
Nominal/Maximum current	A	10/25	5/32	10/65
Minimum measured current	A	0.04	0.02	0.04
Current range (within accuracy class)	A	0.5...25	0.25...32	0.5...65
Maximum peak current	A	750 (10 ms)	960 (10 ms)	1,950 (10 ms)
Supply (& monitored) voltage (U <sub>N</sub> )	V AC	230	230	230
Operating range		(0.8...1.15)U <sub>N</sub>	(0.8...1.15)U <sub>N</sub>	(0.8...1.15)U <sub>N</sub>
Frequency	Hz	50/60	50/60	50/60
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		2,000	2,000	1,000
<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		1,000	1,000	1,000
Pulse length	ms	50	50	50
Internal series resistance	Ω	100	100	100
Maximum Cable length @30 V/20 mA	m	1,000	1,000	1,000
<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

Approvals (according to type)

7E.12.8.230.0002



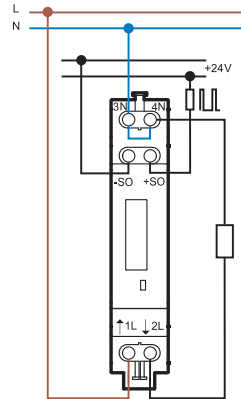
- Nominal current 10 A (25 A Maximum)
- 1-phase 230 V AC
- 35 mm wide



7E.13.8.230.00x0



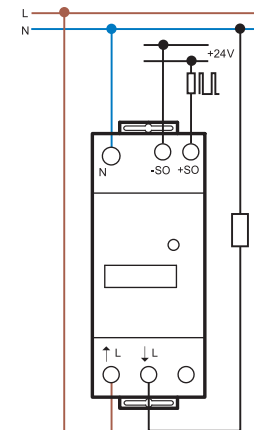
- Nominal current 5 A (32 A Maximum)
- 1-phase 230 V AC
- 17.5 mm wide



7E.16.8.230.00x0



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



## Features

kWh Energy meter  
3-phase with 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 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

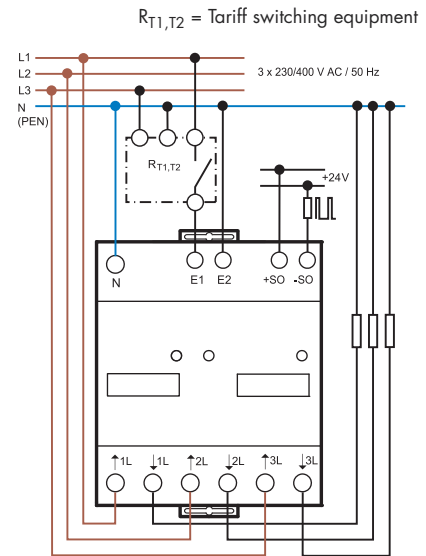
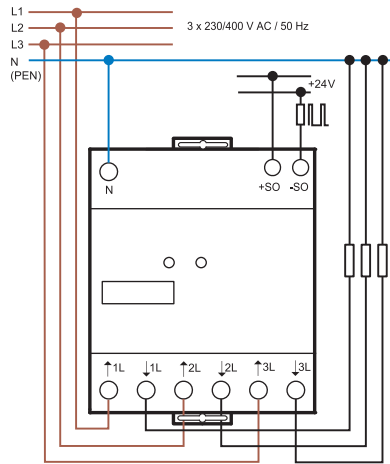


- Nominal current 10 A (65 A Maximum)
- 3-phase
- 70 mm wide

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 8

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	1,950 (10 ms)	1,950 (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	50/60	50/60
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
<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	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	1,000	1,000
<b>Technical data</b>			
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)

CE PTB

## 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 LC-Display
- 3 = 3-phase
- 4 = 3-phase with LC-Display
- 5 = 3-phase with LC-Display for current transformer operation

**Current**

- 2 = 25 A
- 3 = 32 A
- 6 = 65 A (up to 1,500 A, type 7E.56)

**Supply version**

- 8 = AC 50/60 Hz

**Special version**

- 0 = Standard
- 1 = MID compliant versions

**Option**

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

**Supply voltage**

- 230 = 230 V AC 50/60 Hz
- 400 = 3 x 230/400 V AC 50/60 Hz

**All versions/width**

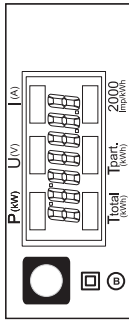
7E.12.8.230.0002/35 mm	7E.36.8.400.0000/70 mm
7E.13.8.230.0000/17.5 mm	7E.36.8.400.0010/70 mm
7E.13.8.230.0010/17.5 mm	7E.36.8.400.0002/70 mm
7E.16.8.230.0000/35 mm	7E.36.8.400.0012/70 mm
7E.16.8.230.0010/35 mm	7E.46.8.400.0002/70 mm
7E.23.8.230.0000/17.5 mm	7E.46.8.400.0012/70 mm
7E.23.8.230.0001/17.5 mm	7E.56.8.400.0000/70 mm
7E.23.8.230.0010/17.5 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		
Isolation	between active part SO+/SO- terminals	kV (1.2/50 µs)	6	6	
	adjacent phases	kV (1.2/50 µs)	—	6	
Insulation	between supply and SO+/SO-	V AC	4,000	4,000	
	between adjacent phases	V AC	—	4,000	
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...1,000)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			
Schock resistance	g/18 ms	30			
Schock resistance of the internal mechanical counter	g/18 ms	350			
Power lost to the environment	without current	W	0.4	0.4	
	with maximum current	W	1	2	
<b>Supply terminals</b>	Max. wire size	<b>7E.12, 7E.13, 7E.23</b>		<b>7E.16, 7E.36, 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		M4 Pozidrive No.1, Phillips No.1, Flat No.1		
<b>SO+/SO- terminals</b>	Max. wire size	solid cable	stranded cable	solid cable	stranded cable
		mm <sup>2</sup>	2.5	1.5	2.5
	AWG	14	16	14	16
	⊕ Screw torque for I <sub>max</sub>	Nm	0.5		0.8
	Screw		M3 Pozidrive No.1, Phillips No.1, Flat No.1		M4 Pozidrive No.1, Phillips No.1, Flat No.1

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

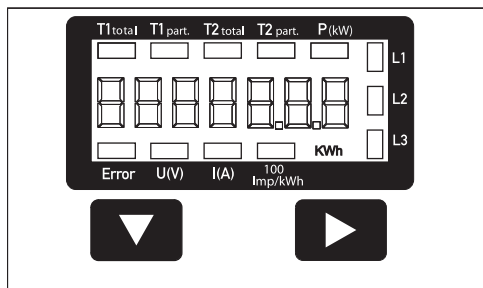
### Indication elements



#### Type 7E.23

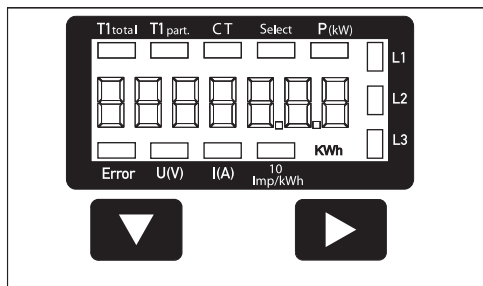
Total	kWh	Indicates total consumption
Tpart.	kWh	Indicates partial consumption, this value is resettable
P	kW	Indicates the instantaneous power
U	V	Indicates the voltage
I	A	Indicates the current
2,000 Imp/kWh		Pulsed according to drawn power Error indication (line 1L/2L inverted) with pulsating 600/600 ms

For 7E.23.8.230.0001 only with total consumption.



#### 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 incorrect current direction - 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 incorrect current direction - 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 operation instructions. Then lock it again with the bridge. For a tamper proof lead seal use 4 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				2,000	100 ms	$kW = (\text{number of pulse per Minute}) / 33.3$
7E.16				1,000	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

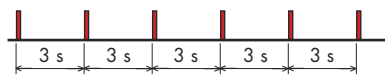
**Type 7E.12, 7E.13, 7E.16**

Device ON, incorrect connection (L-N inverted).  
Mark = 600 ms, Space = 600 ms



**Type 7E.36**

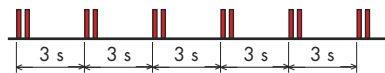
Mark = 100 ms,  
Phase L1↑ L1↓ inverted or loss



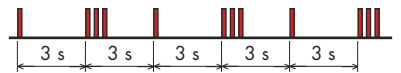
Phase L1↑ L1↓ and L2↑ L2↓ inverted or loss



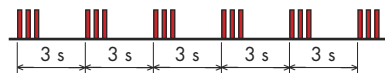
Phase L2↑ L2↓ inverted or loss



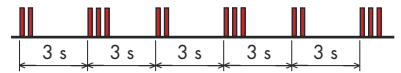
Phase L1↑ L1↓ and L3↑ L3↓ inverted or loss



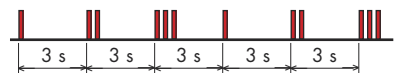
Phase L3↑ L3↓ inverted or loss



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

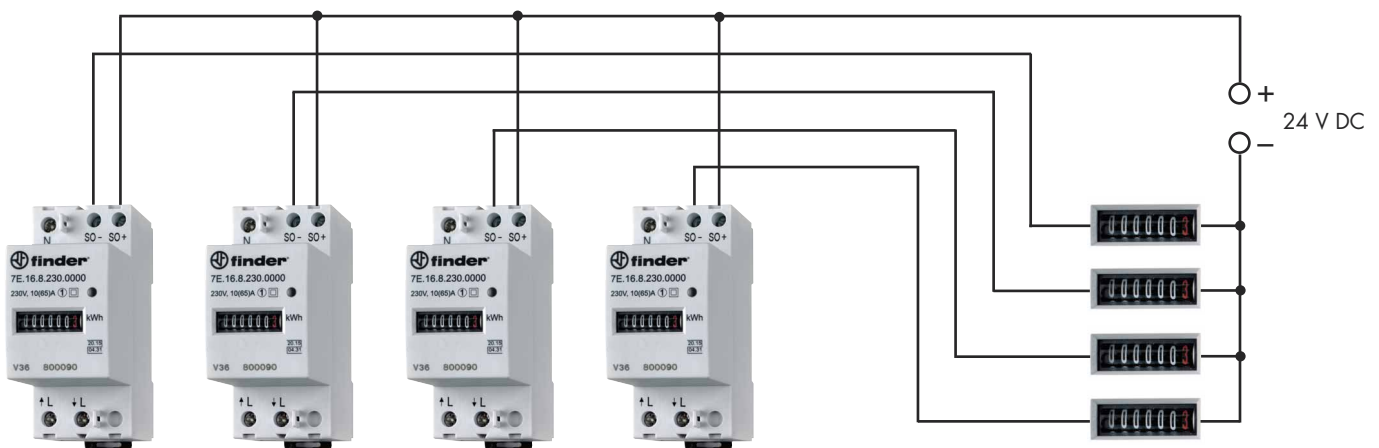


Phase L1↑ L1↓ and L2↑ L2↓ and L3↑ L3↓ inverted or loss



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

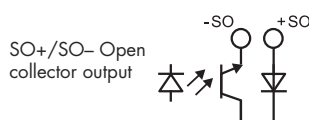
The pulsating open collector output available at terminals SO+ and SO- can be interfaced with the input of a computer, plc or other energy management equipment to allow the remote monitoring of energy consumed.



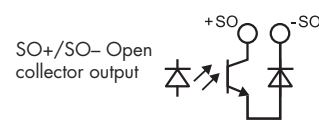
Energy meters – at difference locations  
(Note: Both Single and Dual tariff meters provide only a single pulsating output)

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

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

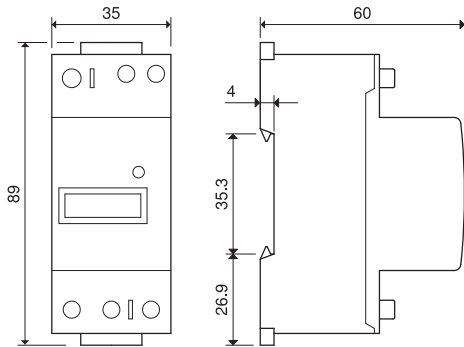


**SO-Output Type 7E.36, 7E.46, 7E.56**

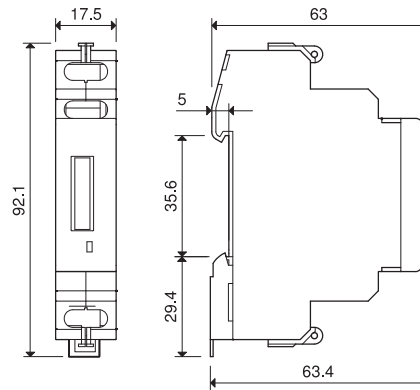


## Outline drawing

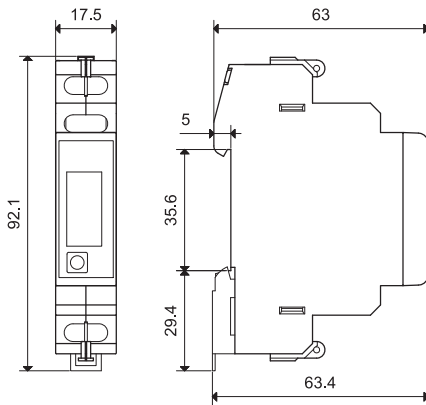
Type 7E.12.8.230.0002 / 7E.16.8.230.0000/10



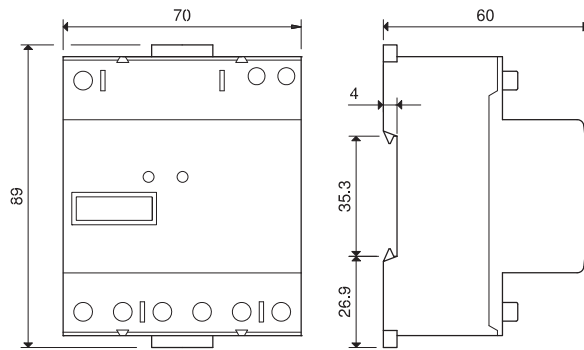
Type 7E.13.8.230.0000/10



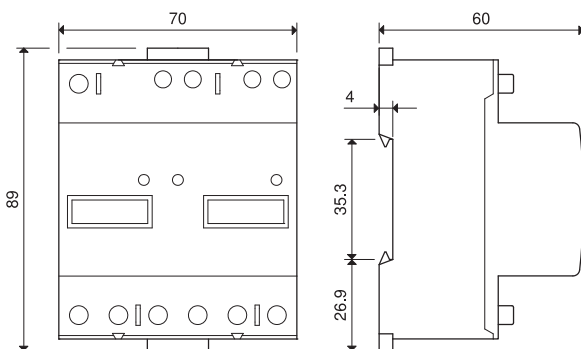
Type 7E.23.8.230.0000/10



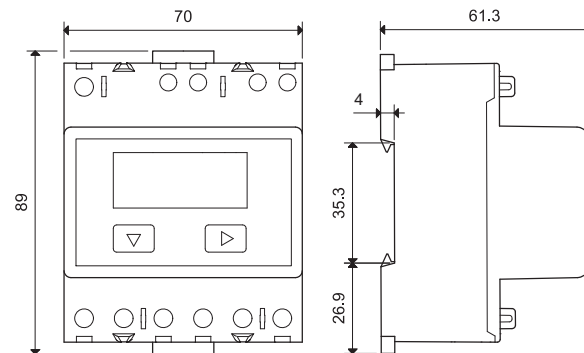
Type 7E.36.8.400.0000/10



Type 7E.36.8.400.0002/12



Type 7E.46.8.400.0002/12 - 7E.56.8.400.0000/10



## Accessories



07E.13

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

07E.13

For the tamper-proof lead seal use 2 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 2 terminal covers

7E.36, 7E.46, 7E.56 - For the tamper-proof lead seal use 4 terminal covers