socomec
Innovative Power Solutions

QUICK START GUIDE

547982D

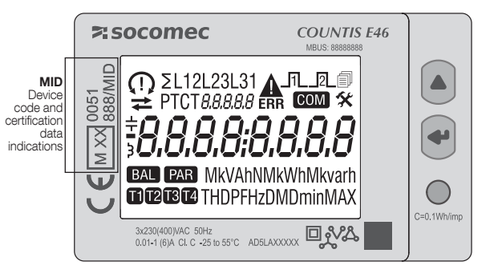
COUNTIS E45/E46

THREE-PHASE DIGITAL ENERGY METERS
MEASURE VIA CT UP TO 12000-A M-BUS

COUNTIS E45 : ref. 4850 3067
COUNTIS E46 (MID) : ref. 4850 3068

Certificate of conformity with MID Directive.
User Manual:
https://www.socomec.com/documentation

www.socomec.com



Measurements

The parameters are available according to the device model.

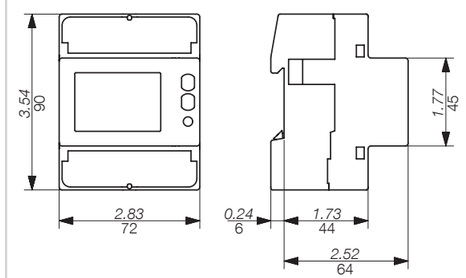
INSTANTANEOUS VALUES	Symbol	Measure unit	Display	Com
Phase to Neutral voltages	∑V	V	•	
	V1, V2, V3			•
Phase to Phase voltages	∑U		•	
	U12, U23, U31			•
Current	∑I	A	•	
	I1, I2, I3, IN			•
Power factor	∑PF		•	•
	PF1, PF2, PF3			•
Apparent power	∑S, S1, S2, S3	kVA	•	•
Active power	∑P, P1, P2, P3	kW	•	•
Reactive power	∑Q, Q1, Q2, Q3	kvar	•	•
Frequency	f	Hz	•	
Phase sequence	CW / CCW		•	
Power direction	⇄		•	
RECORDED DATA	**Symbol**	**Measure unit**	**Display**	**Com**
Total energy counters	Ea, Er (∑)	kWh, kvarh	•	•
	Ea, Er (per phase)		•	
Total apparent energy	Eap (∑)	kVAh	•	
Total ind. and cap. reactive energy	Er (∑)	kvarh	•	
T1/T2/T3/T4 tariff energy counters	Ea, Er (∑)	kWh, kvarh	•	•
T1/T2/T3/T4 tariff ind. and cap. reactive energy	Er (∑)	kvarh	•	
T1/T2/T3/T4 tariff resettable partial energy counters	Ea (∑)	kWh	•	
Resettable partial energy counters	Ea, Er (∑)	kWh, kvarh	•	•
	Eap (∑)	kVAh	•	
Energy balance	∑	kWh, kvarh	•	
OTHER INFORMATION	**Symbol**	**Value/status**	**Display**	**Com**
Present tariff	T	1/2/3/4	•	•
Partial counters	PAR	START/ STOP	•	
S0 output status	⎍	Active/Not active	•	

NOTE: in case of 3 wire connection, phase-neutral voltages, neutral current, phase powers, phase power factors parameters and all phase counters are not available.

Energy balance values calculation

ENERGY BALANCE	Formula
kWh	(+kWh T1) – (-kWh T1) + (+kWh T2) – (-kWh T2)
kvarh	(+kvarh T1) – (-kvarh T1) + (+kvarh T2) – (-kvarh T2)

Dual dimensions: *in*/mm



Technical characteristics

Data in compliance with EN 50470-1, EN 50470-3

GENERAL	
Housing	4 modules DIN 43880
Mounting	DIN rail EN 60715
OPERATING FEATURES	
Connectivity	3/4 wires MID model: 3x 230/400 V Non MID model: 3x 230/400 V to 3x 240/415 V
Storage of energy values and configuration	FRAM
Display tariffs identifier	T1, T2, T3 and T4
SUPPLY	
Autosupplied	
Operating voltage range	184 ... 288 VAC
Operating frequency range	45 ... 65 Hz
Rated power dissipation (max.) Pv	7.5 VA - 0.5 W
CT burden (for each phase)	0,04 VA
OVERLOAD CAPABILITY	
Voltage Un continuous	288 VAC
Voltage Un momentary (1 s)	300 VAC
Current Imax continuous	6 A
Current Imax momentary	20 Imax for 0.5 s
DISPLAY (ACCORDING TO THE SET CT PRIMARY)	
Display type	LCD 8 digits with backlight
Active energy: 1 display, 8-digit	00000.000 kWh ... 999999.99 MWh
Reactive energy: 1 display, 8-digit	00000.000 kvarh ... 999999.99 Mvarh
Apparent energy: 1 display, 8-digit	00000.000 kVAh … 999999.99 MVAh
Instantaneous active power: 1 display, 4-digit	0.000 kW ... 99.99 MW
Instantaneous reactive power: 1 display, 4-digit	0.000 kvar ... 99.99 Mvar
Instantaneous apparent power: 1 display, 4-digit	0.000 kVA ... 99.99 MVA
Intantaneous voltage: 1 display, 4-digit	000.0 ... 999.9 V
Intantaneous current: 1 display, 4-digit	0.000 ... 99.99 kA
Power Factor: 1 display, 4-digit	0.000 … 1.000
Frequency: 1 display, 4-digit	45.00 … 65.00 Hz
Display period refresh	1 s
MEASURING ACCURACY	
Active energy	class C acc. to EN 50470-3
Active energy	class 1 acc. to EN 62053-21
Reactive energy	class 2 acc. to EN 62053-23
MEASURING INPUT	
Type of connection	via current transformer
Certified voltage Un	MID model: 3x 230/400 V Non MID model: 3x 230/400 V to 3x 240/415 V
Current Iref	1 A
Current Imin	0.10 A
Operating range current (Ist ... Imax)	0.002 ... 6 A (Class 1) 0.001 ... 6 A (Class C)
Certified frequency fn	MID model: 50 Hz ± 1 Hz Non MID model: 50/60 Hz ± 1 Hz
Starting current for energy measurement (Ist)	2 mA Class 1 1 mA Class C
CURRENT TRANSFORMER AND FSA	
Minimum CT primary	1 or 5
Maximum CT primary	12000
CT Secondary	1 or 5 A
OPTICAL INTERFACES (LED)	
Meter constant	0.1 Wh/imp

S0 OUTPUT	
Type	Optoisolated - 5 to 27 VDC 27 mA acc. to EN 62053-31
Pulse weight according to the set CT ratio	1 WH → CT = 1 ... 4 5 WH → CT = 5 ... 24 25 WH → CT = 25 ... 124 125 WH → CT = 125 ... 624 1000 WH → CT = 625 ... 3124 10000 WH → CT = 3125 ... 12000
TARIFF INPUT	
Type	Active optoisolated
Voltage range per Tariff	Tariff 1: 0 VAC/DC Tariff 2: 80 … 276 VAC/DC
SAFETY	
Indoor meter	yes
Degree of pollution	2
Operational voltage	300 VAC
AC voltage test (EN 50470-3, 7.2)	4 kV
Impulse voltage test	6 kV 1.2/50 µs
Protection class (EN 50470)	class II
Housing material flame resistance	UL 94 class V0
EMBEDDED COMMUNICATION	
M-Bus	300, 600, 1200, 2400, 4800, 9600 bps
Isolation class	SELV Circuit
ENVIRONMENTAL CONDITIONS	
Mechanical environment	M1
Electromagnetic environment	E2
Operating temperature	-25 ... +55 °C
Limit temperature of transportation and storage	-25 ... +75 °C
Relative humidity (not condensation)	≤80 %
Vibrations	±0.075 mm
Degree protection	IP51(*)/IP20

(*) For the installation in a cabinet at least with IP51 protection.

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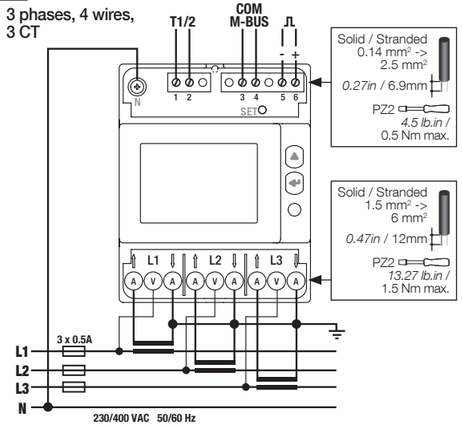
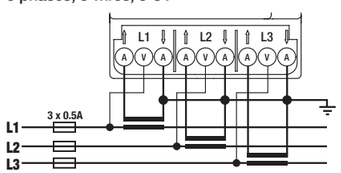
1

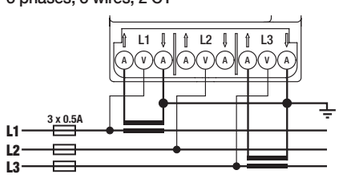
3 phases, 4 wires, 3 CT



3 phases, 3 wires, 3 CT



3 phases, 3 wires, 2 CT



2

SET >3s

CT Secondary

x1

1 = CT secondary 1A
5 = CT secondary 5A

x1 Confirm

x1

CT primary

x1

x1 or more to change the value

x1 Confirm

Repeat those 2 actions for the other digits

x1

Wiring diagram

x1

3.4.3 = 3 phases, 4 wires, 3 currents
3.3.3 = 3 phases, 3 wires, 3 currents
3.3.2 = 3 phases, 3 wires, 2 currents

x1

Tariff control selection

x1

Tariff control selection

COM = ModBus connection
DiG = T1/T2 inputs

x1 Confirm

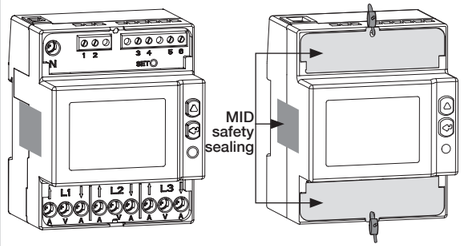
>3s

Exit setup

Y=Save setting and exit
N=Exit without saving
C=Continue without saving

x1 Confirm

3



4

Device switch ON

Ea+ (kWh) Tariff T1
Ea- (kWh) Tariff T1
Er+ lagging (kVarh) Tariff T1
Er- lagging (kVarh) Tariff T1
Er+ leading (kVarh) Tariff T1
Er- leading (kVarh) Tariff T1
Er+ (kVarh) Tariff T1
Er- (kVarh) Tariff T1

x8

x1

Ea+ (kWh) Tariff T2
Ea- (kWh) Tariff T2
Er+ lagging (kVarh) Tariff T2
Er- lagging (kVarh) Tariff T2
Er+ leading (kVarh) Tariff T2
Er- leading (kVarh) Tariff T2
Er+ (kVarh) Tariff T2
Er- (kVarh) Tariff T2

x8

x1

Ea+ (kWh) Tariff T3
Ea- (kWh) Tariff T3
Er+ lagging (kVarh) Tariff T3
Er- lagging (kVarh) Tariff T3
Er+ leading (kVarh) Tariff T3
Er- leading (kVarh) Tariff T3
Er+ (kVarh) Tariff T3
Er- (kVarh) Tariff T3

x8

x1

Ea+ (kWh) Tariff T4
Ea- (kWh) Tariff T4
Er+ lagging (kVarh) Tariff T4
Er- lagging (kVarh) Tariff T4
Er+ leading (kVarh) Tariff T4
Er- leading (kVarh) Tariff T4
Er+ (kVarh) Tariff T4
Er- (kVarh) Tariff T4

x8

x1

Ea+ (kWh) L1, L2, L3, ∑
Ea- (kWh) L1, L2, L3, ∑
Eap (kVAh)
Er+ lagging (kVarh) L
Er- lagging (kVarh) L
Er+ leading (kVarh) C
Er- leading (kVarh) C
Er+ (kVarh) L1, L2, L3, ∑
Er- (kVarh) L1, L2, L3, ∑

x21

x1

Ea+ partial (kWh) Tariff T1, T2, T3, T4
Ea+ partial (kWh)
Ea- partial (kWh) Tariff T1, T2, T3, T4
Ea- partial (kWh)
Eap partial (kVAh)
Er+ partial (kVarh)
Er- partial (kVarh)
Ea Energy balance (kWh)
Er Energy balance (kVarh)

x15

x1

Active power (kW) L1, L2, L3, ∑
Apparent power (kVA) L1, L2, L3, ∑
Reactive power (kVar) L1, L2, L3, ∑
System voltage (∑U), (∑V)
System current (∑I)
System power factor (∑PF)
Frequency (f)

x17

x1

M-Bus parameters selection

x1

Metrological Fw release (Fw Rel1)
Non metrological Fw release (Fw Rel2)
Metrological fw checksum (CS1)
Non metrological fw checksum (CS2)
Installed communciation port (COM)
Wiring diagram (Wir)
CT primary value (CtP)
Full scale value (FSA)

x5

x1

back main menu

M-Bus parameters selection

>3s

x1

x3

x2

x1

x4

Mbus secondary address

Baudrate

All partial counters reset

Exit from setup (on any page) >3s

Y=Save setting and exit
N=Exit without saving
C=Continue without saving

x1 Confirm

Print : 70 g/m2 - 425 x 210 mm > 85 x 105 mm - R/V - B&W