

Energy-meters three-phase - BASIC

ENGLISH

**digital active energy-meter
2 tariffs - 2 S0**

- ▶ **Direct connection 80 A**
- ▶ **Connection through CT .../5 A till 10.000/5 A**

Application

The energy-meters "LCD screen for perfect reading" are used to measure three-phase systems like in Residential, Utility and Industrial applications.

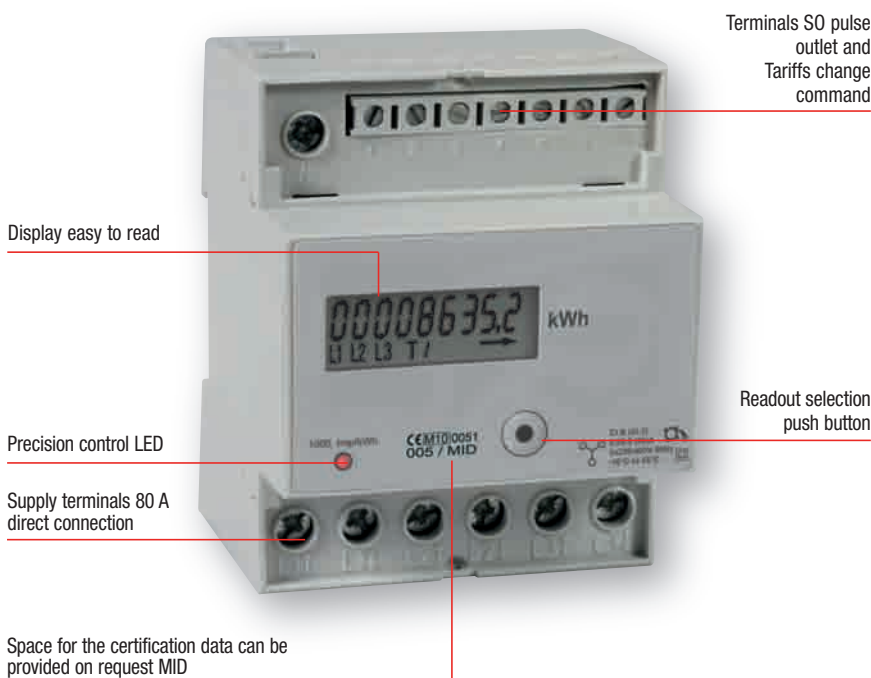


Function

Display

		Unit	ID
Active energy	Tariff 1	kWh	Energy absorbed or supplied
	Tariff 2	kWh	Energy absorbed or supplied
Phase disconnection			Phase Err
Active phases			L1 - L2 - L3
Primary transformer	5 ... 10.000/5	A	CT (current transformer)

**4 standard module housing, suitable for DIN rail mounting
Direct connection 80 A**



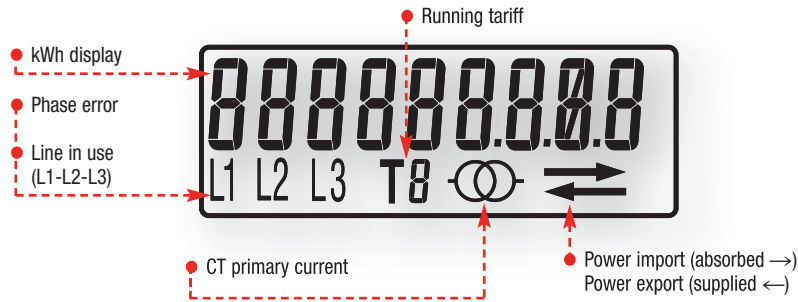
Energy-meters three-phase - BASIC

digital active energy-meter
2 tariffs - 2 S0

ENGLISH

Display

Liquid crystal display



Sealable terminal covers



Main Pages



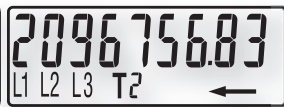
Import → Active Energy T1



Export ← Active Energy T1
(Example with line 2 missing)



Import → Active Energy T2



Export ← Active Energy T2



Current transformer turns ratio



Firmware release



Firmware object code checksum

4 standard module housing, suitable for DIN rail mounting Connection through CT .../5 A till 10.000/5 A

Primary current
CT selection
(5 to 10.000/5 A
5 A step)

Terminals S0 pulse
outlet and Tariffs
change command

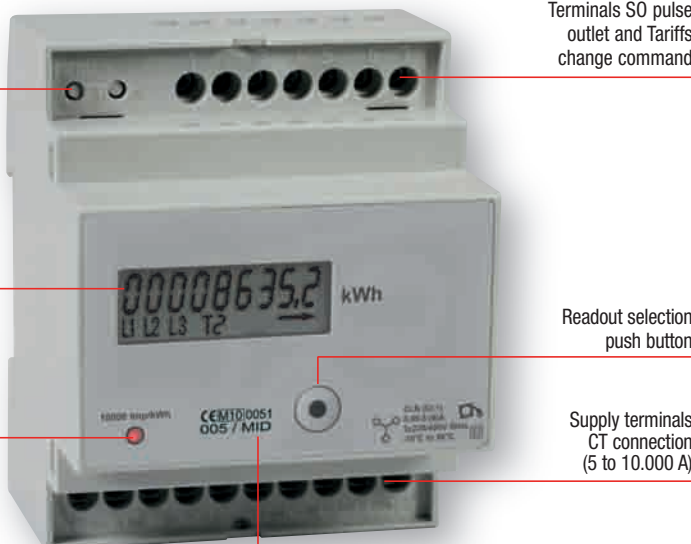
Display easy to read

Readout selection
push button

Precision control LED

Supply terminals
CT connection
(5 to 10.000 A)

Space for the certification data can be
provided on request MID





- ▶ Direct connection 80 A
- ▶ Connection through CT .../5 A till 10.000/5 A

Overview

Active energy-meters for three-phase alternating current with either 2, 9 digits digital counters. These meters have 1 S0 output generating pulses for remote processing of the instantaneous energy active measurements for 2 tariff.

- For direct connection 80 A, or for transformer .../5 A
- For transformer primary current of 5 A to 10.000/5 A. Input is in 5 A increments
- 9 digits - 4 display for energy values indication
- Detection of connection errors (phase transposition and phase missing)
- Accuracy class 1 for active energy according to EN 50470-3 (B)
- Most attractive operating range current (**Ist ... I_{max}**)
for direct connection 80 A = 0.015 ... 80 A
for connection by CT .../5 A = 0.003 ... 5 A
- Energy register zero setting (**NO MID**)
- Energy register for import and export
- Sealable terminal covers only for MID version
- 4 DIN modules wide (72 mm)

Technical data

Data in compliance with EN 50470-1, EN 50470-3 and EN 62053-31

			ECSEM70-ECSEM74MID direct connection 80 A	ECSEM62-ECSEM66MID CT connection till 10.000/5 A
General characteristics				
• Housing	DIN 43880	DIN	4 modules	4 modules
• Mounting	EN 60715	35 mm	DIN rail	DIN rail
• Depth		mm	70	70
• Reference standard	active energy	-	EN 50470-1-3	EN 50470-1-3
	pulse output		EN 62053-31	EN 62053-31
Operating features				
• Connectivity	to three-phase network	n° wires	4	4
• Storage of energy values and configuration	digital display (EEPROM)	-	yes	yes
• Display tariffs identifier	for active energy	n° 2	T1 and T2	T1 and T2
Supply				
• Rated control supply voltage U_n		VAC	230	230
• Operating range voltage		V	184 ... 276	184 ... 276
• Rated frequency f_n		Hz	50	50
• Rated power dissipation (max. for phase) P_v		VA (W)	≤8 (0.6)	≤8 (0.6)
Overload capability				
• Voltage U_n	continuous; phase/phase	V	480	480
	1 second; phase/phase	V	800	800
	continuous; phase/N	V	276	276
	1 second; phase/N	V	300	300
• Current I_{max}	continuous	A	80	6
	momentary (0,5 s)	A	-	120
	momentary (10 ms)	A	2400	-
Display (readouts)				
• Connection errors and phase out	discernible from phase-sequence indic.	-	PHASE Err	PHASE Err
• Display type	LCD	n° digits	9 (2 decimal)	9 (2 decimal)
	digit dimensions	mm x mm	6.00 x 3	6.00 x 3
• Active energy: 1 display, 9 digit - 2 tariffs + display import or export (arrow)	min. measuring energy	kWh	0.01	0.01
• Instantaneous tariff measurement	max. measuring overflow	kWh	9999999.99	9999999.99
• Transformer primary current	1 display, 1-digit	-	T1 or T2	T1 or T2
• Display period refresh		A	-	5 ... 10.000
		s	1	1
Measuring accuracy				
• Active energy	acc.to EN 50470-3	class 1	B	B
Measuring input				
• Type of connection			direct	transformer .../5 A
• Voltage U_n	phase/phase	V	400	400
	phase/N	V	230	230
• Operating range voltage	phase/phase	V	319 ... 480	319 ... 480
	phase/N	V	184 ... 276	184 ... 276
• Current I_{ref}		A	5	-
• Current I_n		A	-	5
• Current I_{min}		A	0.25	0.05
• Operating range current (Ist ... I_{max})	direct connection	A	0.015 ... 80	-
	transformer connection (CT)	A	-	0.003 ... 6
• Transformer current	primary current of the transformer	A	-	5 ... 10.000
	smallest input step adjus. in 5 A steps	A	-	5
• Frequency		Hz	50	50
• Input waveform		-	sinusoidal	sinusoidal
• Starting current for energy measurement (Ist)		mA	15	3
Pulse output S0				
• Pulse output	acc.to EN 62053-31	-	yes	yes
• Quantity pulse output	for active energy T1 and T2	Imp/kWh	500	-
	for direct connection 80 A	Imp/kWh	-	100-10-1
	depending on the transf. factor.	ms	30 ±2 ms	30 ±2 ms
• Pulse duration		VAC (DC)	5 ... 230 ±5% (5 ... 300)	5 ... 230 ±5% (5 ... 300)
• Required voltage	min. (max.)			

Technical data

Data in compliance with EN 50470-1, EN 50470-3 and EN 62053-31

		ECSEM70-ECSEM74MID direct connection 80 A	ECSEM62-ECSEM66MID CT connection till 10.000/5 A
Pulse output S0	acc.to EN 62053-31		
• Permissible current	pulse ON (max. 230 V AC/DC)	90 mA	90
• Permissible current	pulse OFF (leak. cur. max. 230 V AC/DC)	1 µA	1
Optical interfaces			
• Front side (<i>accuracy control</i>)	LED	imp/kWh	1000
			10.000
Safety acc. to EN 50470-1			
• Indoor meter		-	yes
• Degree of pollution		-	yes
• Operational voltage		V	2
• AC voltage test (EN 50470-3, 7.2)		kV	300
• Impulse voltage test		1.2/50 µs-kV	4
• Protection class (EN 50470)		class	6
• Housing material flame resistance	UL 94	class	II
• Safety-sealing between upper and lower housing part (mod. ECSEM66MID-ECSEM74MID)-			V0
			yes
			yes
Connection terminals			
• Type cage main current paths	screw head Z +/-	POZIDRIV	PZ2
• Type cage pulse output	blade for slotted screw		PZ1
• Terminal capacity main current paths	solid wire min. (max.)	mm	0.8 x 3.5
	stranded wire with sleeve min. (max.)	mm ²	0.8 x 3.5
	solid wire min. (max.)	mm ²	1 (4)
	stranded wire with sleeve min. (max.)	mm ²	1 (4)
• Terminal capacity pulse output	solid wire min. (max.)	mm ²	1 (4)
	stranded wire with sleeve min. (max.)	mm ²	1 (4)
			1 (4)
			1 (4)
Environmental conditions			
• Mechanical environment		-	M1
• Electromagnetic environment		-	E2
• Operating temperature		°C	-10 ... +55
• Limit temperature of transportation and storage		°C	-25 ... +70
• Relative humidity (not condensation)		%	≤80
• Vibrations	50 Hz sinusoidal vibration amplitude	mm	±0.075
• Degree protection	housing when mounted in front (term.)	-	±0.075
			IP51(*)/IP20
			IP51(*)/IP20

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

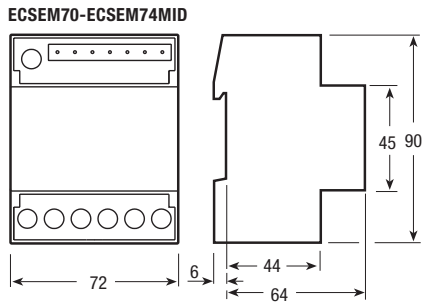
Selection and ordering data

three-phase active energy-meter - 4 modules DIN

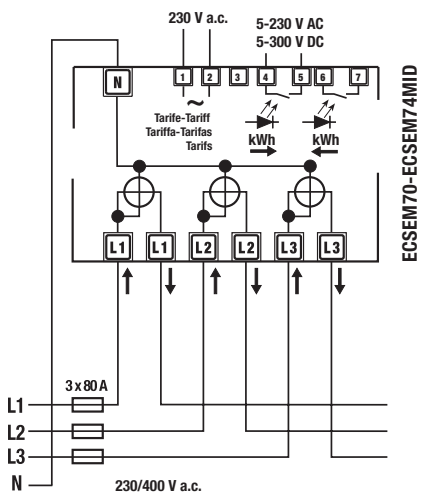
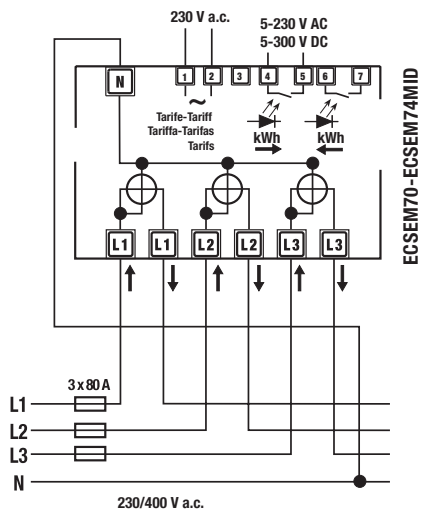
Code	Type	Code	Type	Description
Resettable Energy registers (not MID certified)		Non Resettable Energy registers MID certified		
ECSEM70	ECS3-80 Basic	ECSEM74MID	ECS3-80 Basic MID	three-phase digital active energy-meter with direct connection 0.25-5 (80) A - 2 tariffs - 2 S0
ECSEM62	ECS3-5 Basic	ECSEM66MID	ECS3-5 Basic MID	three-phase digital active energy-meter with connection by CT .../5 A, up to 10.000/5 A - 0.05-5 (6) A - 2 tariffs - 2 S0

► Direct connection 80 A

Overall dimensions



Circuit diagrams

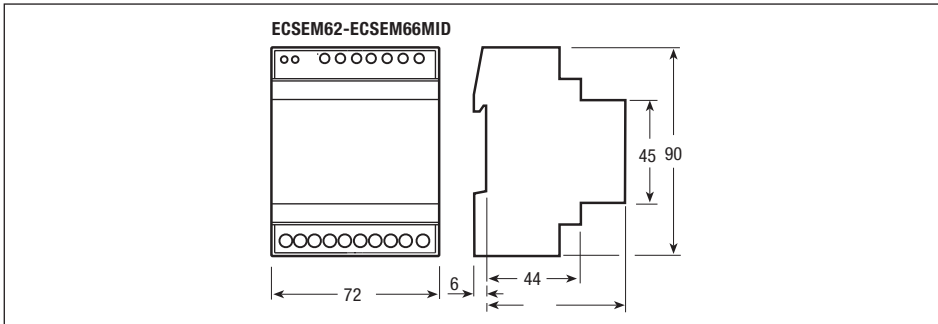


Wire N needs to be connected to the meter

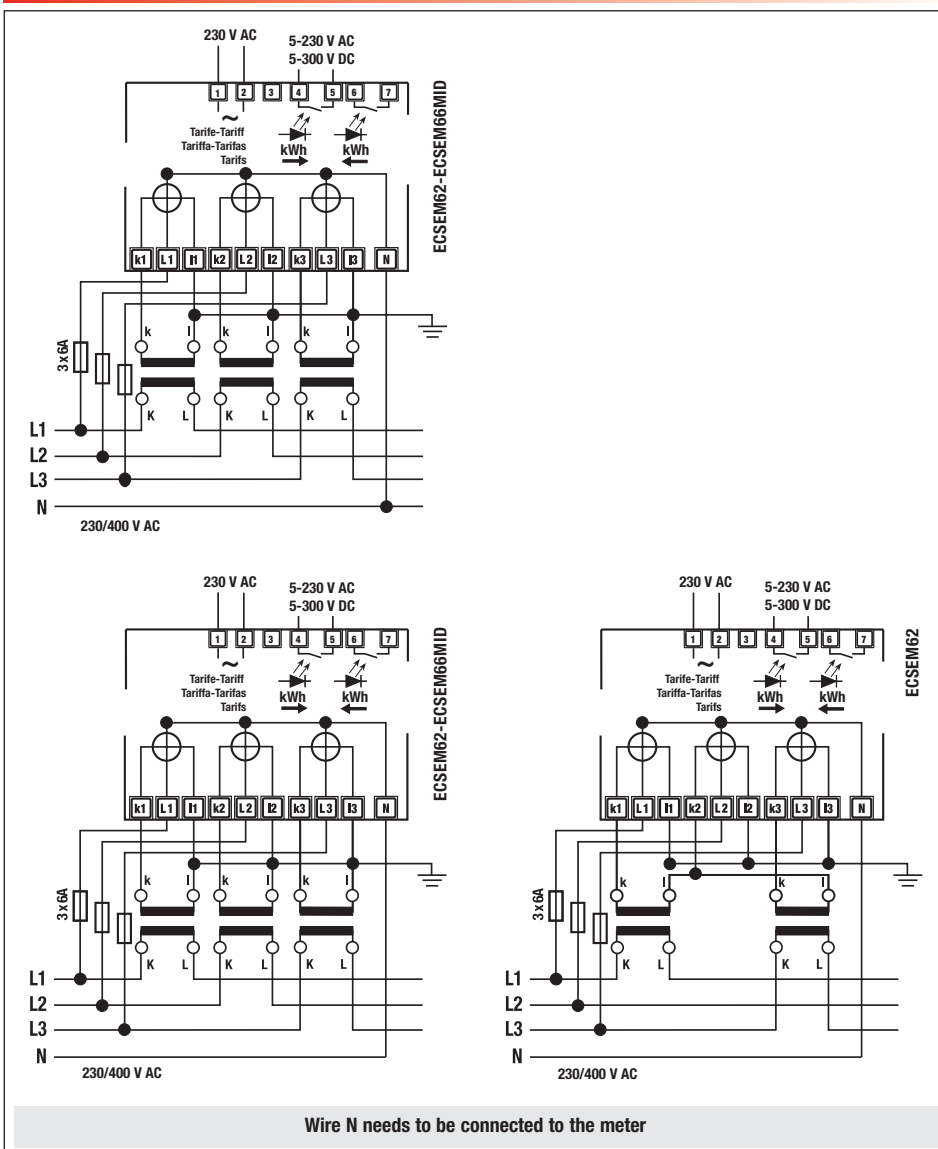
A fuse of 80 A is recommended for the line protection.

► Connection through CT .../5 A till 10.000/5 A

Overall dimensions



Circuit diagrams



Instructions for the connection of transformer counters

A fuse of 6 A is recommended for the line protection.
Current transformers must not be operated with open terminals since dangerous high voltages might occur which may result in personal injuries and property damage. In addition to this, the transformers are exposed to thermal overload.

Energy-meters three-phase - BASIC

digital active energy meter with partial active energy counter resettable
and inbuilt communication Modbus RTU or M-Bus - 2 tariffs

ENGLISH

- ▶ Direct connection 80 A
- ▶ Connection through CT .../5 A till 10.000/5 A

Application

Digital energy-meter with LCD Display for perfect reading, are used to measure active energy in three phase systems like Residential, Utility and Industrial application. Monitoring of the energy consumption goes via Modbus RTU or M-Bus communication.

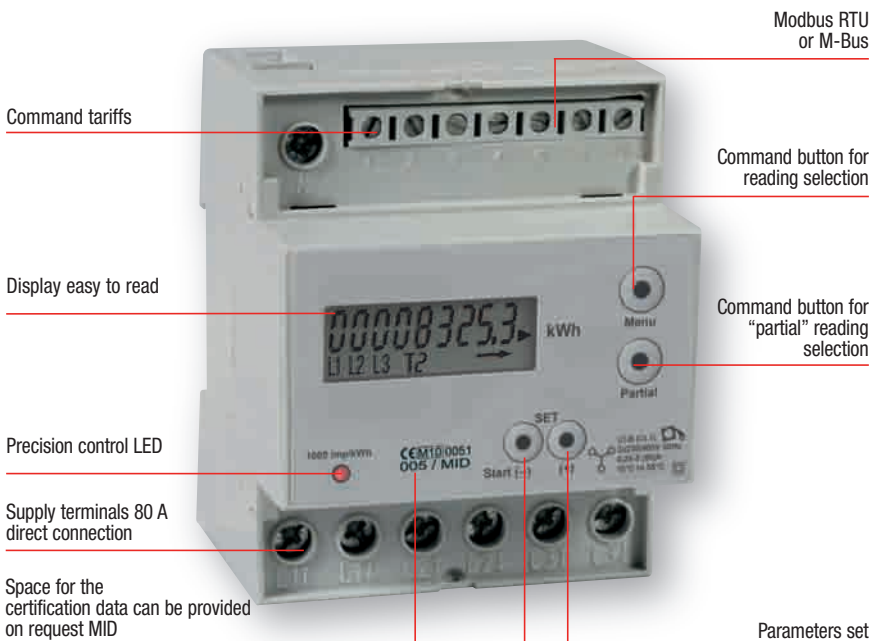


Function

Display

		Unit	ID
Active energy	Tariff 1	kWh	Energy absorbed or supplied
	Tariff 2	kWh	Energy absorbed or supplied
Active energy "Partial"	Tariff 1	kWh	Energy absorbed or supplied
	Tariff 2	kWh	Energy absorbed or supplied
Phase disconnection			Phase Err
Active phases			L1 - L2 - L3
Primary transformer	5 ... 10.000/5	A	CT (current transformer)

4 standard module housing, suitable for DIN rail mounting Direct connection 80 A



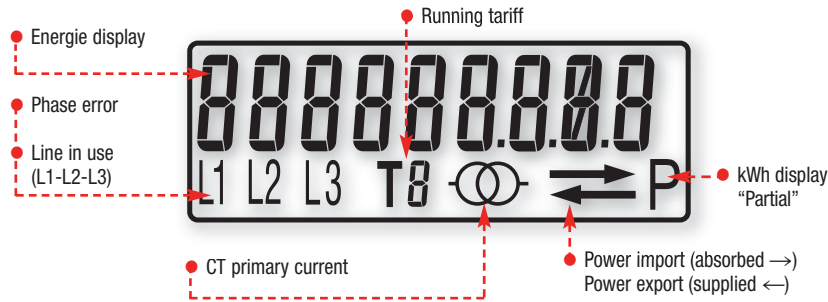
Energy-meters three-phase - BASIC

digital active energy meter with partial active energy counter resettable and inbuilt communication Modbus RTU or M-Bus - 2 tariffs

ENGLISH

Display

Liquid crystal display



Sealable terminal covers



Main Pages



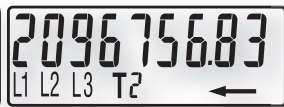
● Import → Active Energy T1



● Export ← Active Energy T1
(Exemple with line 2 missing)



● Import → Active Energy T2



● Export ← Active Energy T2



● Current transformer turns ratio

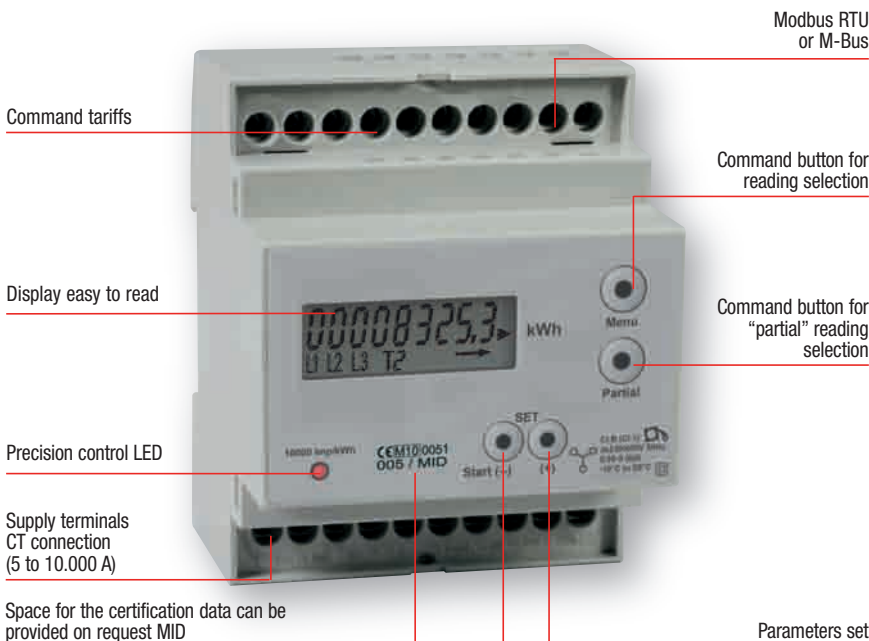


● Firmware release



● Firmware object code checksum

4 standard module housing, suitable for DIN rail mounting Connection through CT .../5 A till 10.000/5 A



Energy-meters three-phase - BASIC

digital active energy meter with partial active energy counter resettable
and inbuilt communication Modbus RTU or M-Bus - 2 tariffs

ENGLISH



- ▶ Direct connection 80 A
- ▶ Connection through CT .../5 A till 10.000/5 A

Overview

Active energy-meters for three-phase alternating current with either 2, 9 digits digital counters. These meters have 2 SO and 2 tariffs that are managed through communication internal to the meter via Modbus RTU or M-Bus.

- For direct connection 80 A, or for transformer .../5 A
- For transformer primary current of 5 A to 10.000/5 A. Input is in 5 A increments
- 9 digits for energy totalized values
- Detection of connection errors (phase transposition and phase missing)
- Accuracy class 1 for active energy according to EN 50470-3 (B)
- Most attractive operating range current (*Ist ... I_{max}*)
for direct connection 80 A = 0.015 ... 80 A
for connection by CT .../5 A = 0.003 ... 5 A
- Energy register totalizing zero setting (NO MID)
- Energy register "Partial kWh" resettable
- Sealable terminal covers
- 4 DIN modules wide (72 mm)

Technical data

Data in compliance with EN 50470-1, EN 50470-3 and EN 62053-31

			ECSEM71-ECSEM75MID ECSEM72-ECSEM76MID direct connection 80 A	ECSEM63-ECSEM67MID ECSEM64-ECSEM68MID CT connection till 10.000/5 A
General characteristics				
• Housing	DIN 43880	DIN	4 modules	4 modules
• Mounting	EN 60715	35 mm	DIN rail	DIN rail
• Depth		mm	70	70
• Reference standard	active energy	-	EN 50470-1-3	EN 50470-1-3
	pulse output		EN 62053-31	EN 62053-31
Operating features				
• Connectivity	to three-phase network	n° wires	4	4
• Storage of energy values and configuration	digital display (EEPROM)	-	yes	yes
• Display tariffs identifier	for active energy	n° 2	T1 and T2	T1 and T2
Supply				
• Rated control supply voltage <i>Un</i>		VAC	230	230
• Operating range voltage		V	184 ... 276	184 ... 276
• Rated frequency <i>fn</i>		Hz	50	50
• Rated power dissipation (max. for phase) <i>Pv</i>		VA (W)	≤8 (0.6)	≤8 (0.6)
Overload capability				
• Voltage <i>Un</i>	continuous; phase/phase	V	480	480
	1 second; phase/phase	V	800	800
	continuous; phase/N	V	276	276
	1 second; phase/N	V	300	300
• Current <i>I_{max}</i>	continuous	A	80	6
	momentary (0,5 s)	A	-	120
	momentary (10 ms)	A	2400	-
Display (readouts)				
• Connection errors and phase out	discernible from phase-sequence indic.	-	PHASE Err	PHASE Err
• Display type	LCD	n° digits	9 (2 decimals)	9 (2 decimals)
	digit dimensions	mm x mm	6.00 x 3	6.00 x 3
• Active energy: 1 display, 9 digit - 2 tariffs + display import or export (arrow)	min. measuring energy	kWh	0.01	0.01
• Instantaneous tariff measurement	max. measuring overflow	kWh	9999999.99	9999999.99
• Transformer primary current	1 display, 1-digit	-	T1 or T2	T1 or T2
• Display period refresh		A	-	5 ... 10.000
		s	1	1
Measuring accuracy				
• Active energy and power	acc.to EN 50470-3	class	B	B
Measuring input				
• Type of connection			direct	transformer .../5 A
• Voltage <i>Un</i>	phase/phase	V	400	400
	phase/N	V	230	230
• Operating range voltage	phase/phase	V	319 ... 480	319 ... 480
	phase/N	V	184 ... 276	184 ... 276
• Current <i>I_{ref}</i>		A	5	-
• Current <i>I_n</i>		A	-	5
• Current <i>I_{min}</i>		A	0.25	0.05
• Operating range current (<i>Ist ... I_{max}</i>)	direct connection	A	0.015 ... 80	-
	transformer connection (CT)	A	-	0.003 ... 6
• Transformer current	primary current of the transformer	A	-	5 ... 10.000
	smallest input step adjus. in 5 A steps	A	-	5
• Frequency		Hz	50	50
• Input waveform		-	sinusoidal	sinusoidal
• Starting current for energy measurement (<i>Ist</i>)		mA	15	3
Optical interfaces				
• Front side (<i>accuracy control</i>)	LED	imp/kWh	1000	10.000

measurement

Energy-meters three-phase - BASIC

digital active energy meter with partial active energy counter resettable
and inbuilt communication Modbus RTU or M-Bus - 2 tariffs

ENGLISH

Technical data

Data in compliance with EN 50470-1, EN 50470-3 and EN 62053-31

			ECSEM71-ECSEM75MID ECSEM72-ECSEM76MID direct connection 80 A	ECSEM63-ECSEM67MID ECSEM64-ECSEM68MID CT connection till 10.000/5 A
Safety acc. to EN 50470-1				
• Indoor meter	-		yes	yes
• Degree of pollution	-		2	2
• Operational voltage	V		300	300
• AC voltage test (EN 50470-3, 7.2)	kV		4	4
• Impulse voltage test	1.2/50 µs-kV		6	6
• Protection class (EN 50470)	class		II	II
• Housing material flame resistance	UL 94		V0	V0
• Safety-sealing between upper and lower housing part (mod. ECSEM75MID-ECSEM76MID-ECSEM67MID-ECSEM68MID)	-		yes	yes
Embedded communication				
• Modbus RTU	RS-485 - 3 wires	-	up to 19.200 bps	up to 19.200 bps
• M-Bus	2 wires	-	up to 9.600 bps	up to 9.600 bps
Connection terminals				
• Type cage main current paths	screw head Z +/-	POZIDRIV	PZ2	PZ1
• Type cage pulse output	blade for slotted screw	mm	0.8 x 3.5	0.8 x 3.5
• Terminal capacity main current paths	solid wire min. (max.)	mm ²	1.5 (35)	1 (4)
	stranded wire with sleeve min. (max.)	mm ²	1.5 (35)	1 (4)
• Terminal capacity pulse output	solid wire min. (max.)	mm ²	1 (4)	1 (4)
	stranded wire with sleeve min. (max.)	mm ²	1 (2.5)	1 (4)
Environmental conditions				
• Mechanical environment	-		M1	M1
• Electromagnetic environment	-		E2	E2
• Operating temperature	°C		-10 ... +55	-10 ... +55
• Limit temperature of transportation and storage	°C		-25 ... +70	-25 ... +70
• Relative humidity (not condensation)	%		≤80	≤80
• Vibrations	50 Hz sinusoidal vibration amplitude	mm	±0.075	±0.075
• Degree protection	housing when mounted in front (term.)	-	IP51(*)/IP20	IP51(*)/IP20

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

Selection and ordering data

digital active energy-meter with partial active energy counter resettable,
and inbuilt communication **Modbus** - 2 tariffs - 4 modules DIN

Code	Type	Code	Type	Description
Not MID certified: All Energy registers Resettable		MID certified: Only Partial Energy registers Resettable		
ECSEM72	ECS3-80 Basic Modbus	ECSEM76MID	ECS3-80 Basic MID Modbus	three-phase digital active energy-meter with direct connection 0.25-5 (80) A, and inbuilt communication Modbus RTU - 2 tariffs
ECSEM64	ECS3-5 Basic Modbus	ECSEM68MID	ECS3-5 Basic MID Modbus	three-phase digital active energy-meter with connection by CT .../5 A, up to 10.000/5 A - 0.05-5 (6) A, and inbuilt communication Modbus RTU - 2 tariffs

Selection and ordering data

digital active energy-meter with partial active energy counter resettable,
and inbuilt communication **M-Bus** - 2 tariffs - 4 modules DIN

Code	Type	Code	Type	Description
Not MID certified: All Energy registers Resettable		MID certified: Only Partial Energy registers Resettable		
ECSEM71	ECS3-80 Basic M-Bus	ECSEM75MID	ECS3-80 Basic MID M-Bus	three-phase digital active energy-meter with direct connection 0.25-5 (80) A, and inbuilt communication M-Bus - 2 tariffs
ECSEM63	ECS3-5 Basic M-Bus	ECSEM67MID	ECS3-5 Basic MID M-Bus	three-phase digital active energy-meter with connection by CT .../5 A, up to 10.000/5 A - 0.05-5 (6) A, and inbuilt communication M-Bus - 2 tariffs

Energy-meters three-phase - BASIC

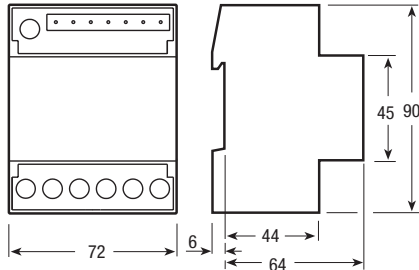
digital active energy meter with partial active energy counter resettable and inbuilt communication Modbus RTU or M-Bus - 2 tariffs

ENGLISH

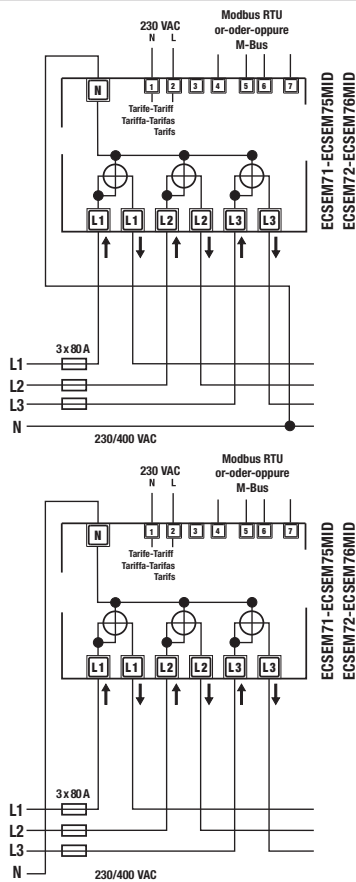
► Direct connection 80 A

Overall dimensions

ECSEM71-ECSEM75MID
ECSEM72-ECSEM76MID



Circuit diagrams



Wire N needs to be connected to the meter

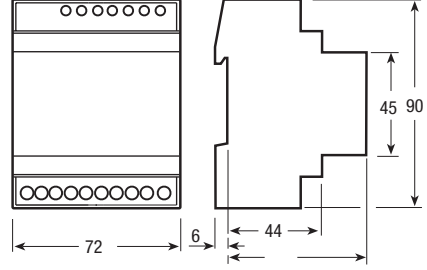
A fuse of 80 A is recommended for the line protection.

measurement

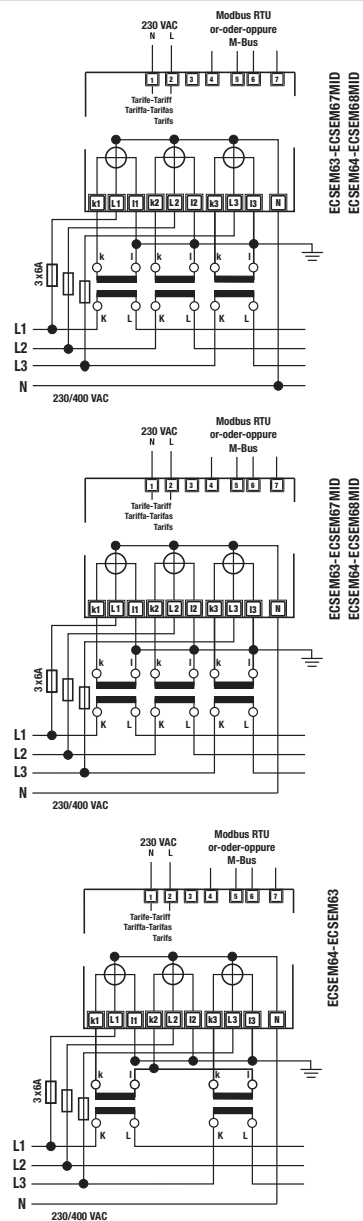
► Connection through CT .../5 A till 10.000/5 A

Overall dimensions

ECSEM63-ECSEM67MID
ECSEM64-ECSEM68MID



Circuit diagrams



Wire N needs to be connected to the meter

Instructions for the connection of transformer counters

A fuse of 6 A is recommended for the line protection. Current transformers must not be operated with open terminals since dangerous high voltages might occur which may result in personal injuries and property damage. In addition to this, the transformers are exposed to thermal overload.